

International Poultry Production

Volume 32 Number 8 (2024)

Practical information for progressive poultry professionals

FEATURED IN THIS ISSUE

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Feeding Method to
Maximize Growth**

**Practical Biosecurity
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Protect Your Flocks**

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**The Role of Precision
Weighing in Advanced
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Volume 33 (2025)

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Editor's Perch

Disease control in poultry production is one of the most critical challenges for producers worldwide. With rising global demand for poultry products, maintaining healthy flocks is essential for productivity and profitability and for addressing concerns about animal welfare, antimicrobial resistance, and food security.

Biosecurity is the cornerstone of disease control, encompassing measures like restricted farm access, sanitation protocols, and controlled entry points. Yet, how consistently are these measures implemented across regions and production scales? Small-scale farms, often lacking resources, are particularly vulnerable. Can technology provide cost-effective solutions for these operations?

Vaccines have significantly reduced the impact of diseases like Newcastle and Marek's disease. Are vaccination programs adequately tailored to emerging pathogens? Could innovations like in-ovo or feed-based vaccines transform immunisation practices?

The overuse of antimicrobials has contributed to antimicrobial resistance (AMR), sparking

regulatory efforts. Are these sufficient, particularly in countries with less oversight? Should the industry accelerate alternatives like probiotics and phage therapy to reduce reliance on antimicrobials?

Nutritional strategies, including feed additives like organic acids and enzymes, support immunity and reduce pathogens. Are producers fully exploiting these advancements?

Are international collaborations and early warning systems sufficient to prevent future pandemics?

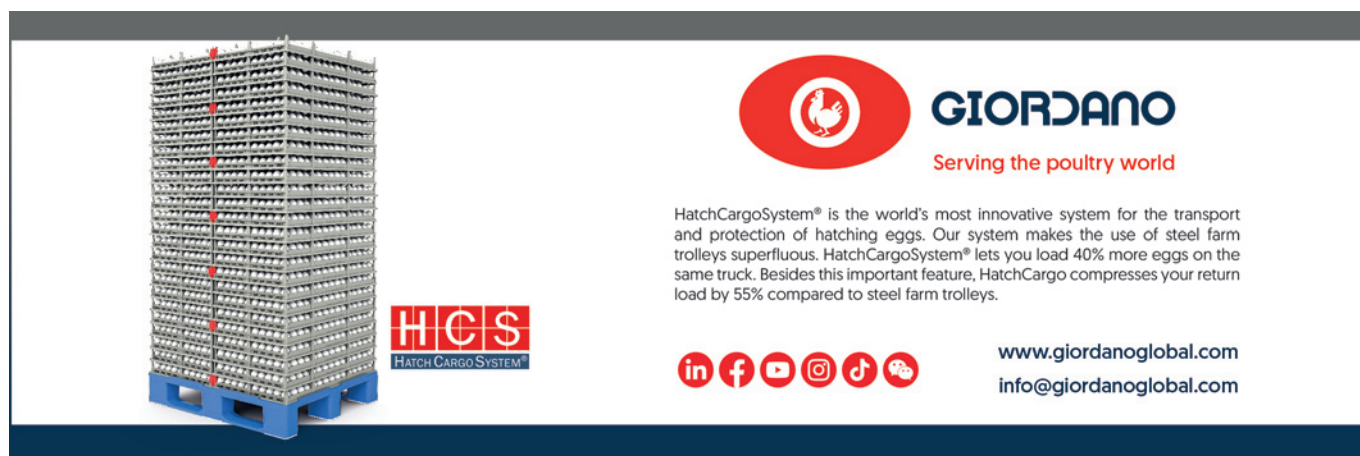
Balancing disease control with ethical and sustainable practices is another challenge. Can we develop alternatives to mass culling and align efforts with sustainability goals?

Disease control in poultry production is a multifaceted challenge requiring a holistic approach. As industry professionals, are we doing enough to anticipate and mitigate future threats? Are current strategies adaptable to the dynamic nature of disease emergence? By asking these questions and fostering global collaboration, the poultry sector can take significant strides toward a healthier and more sustainable future. ■

Cover Picture:

Keep a close eye on your flocks!

(photo courtesy of EW-Nutrition- see page 16)



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International Poultry Production ISSN 1364-565X (print) ISSN 3033-4187 (online) is published in February, March, May, June, August, September, October and December by Agriinsight Publications Ltd and distributed worldwide by Spatial Global Limited, Spatial House, Willow Farm Business Park, Castle Donington, Derby, DE74 2TW England.

World Focus

An executive summary of key international issues

UKRAINE

Egg market faces oversupply

The Ukrainian egg market has swung from a two-year shortage to an oversupply crisis, causing a steep price decline. Industry experts attribute the surplus to producers ramping up operations to meet past demand, combined with reduced domestic consumption. Export opportunities have also dwindled due to logistical challenges and heightened competition in international markets. Farmers are now grappling with financial strain raising concerns about long-term sustainability. Stakeholders are urging strategic market interventions, including export facilitation and domestic promotion campaigns.

RUSSIA

Plan to ban free-range poultry farming reversed

The Russian government has backtracked on its proposed ban on free-range poultry farming following pushback from farmers and industry stakeholders. The ban, initially justified as a measure to prevent the spread of avian influenza, faced criticism for its potential impact on small-scale and organic producers. The reversal reflects growing consumer demand for free-range and organic products, as well as concerns about market diversity. Officials have pledged to collaborate with producers on alternative solutions to balance disease control with sustainable and ethical farming practices.

UNITED KINGDOM

Changes to poultry marketing regulations

The UK government has announced changes to poultry marketing regulations, aiming to align standards with evolving industry practices and consumer expectations. The updated rules redefine labelling criteria for free-range, organic, and barn-reared poultry, focusing on transparency and animal welfare. Stricter compliance requirements for production methods and traceability are also included, ensuring greater accountability across the supply chain. Industry leaders have welcomed the move, though some have raised concerns about increased costs for smaller producers.

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AGRIINSIGHT PUBLICATIONS

Feed mixture: a feeding method to maximise growth

Feed is a critical factor in chicken growth, and there are several important ways to achieve optimal flock growth through strategic feeding.

By Petr Lolek & Vladimír Zmrhal,
VEIT Electronics
poulttryscales.com

EARLY FEEDING

Broiler chickens are very efficient in utilising nutrients from feed for growth; therefore, any feed intervention has a significant impact on growth performance.

Early nutritional support through the addition of pre-starter diets is an effective method. Pre-starters can be added to trays during transportation and are usually used until day 4 of fattening.

The use of pre-starters with lower levels of calcium (4 g/kg) from 0 to 4 days of age resulted in positive effects on body weight maintained to market age (+ 2.54%), heavier carcasses (+ 2.2%), and better uniformity of about 3% when compared to chickens fed the usual starter diets.

Early access to feed and water is crucial to supporting growth in broilers. Therefore, feed must be placed in feeders and scattered on paper as soon as the chickens arrive at the houses.

Ideally, about 50% of the floor area should be covered with feed.

Picking feed from the ground is a natural behaviour, and feed on the ground, combined with increased light intensity, is a good way to initiate growth in chickens.

Feed deprivation after hatching has a detrimental effect on the growth performance of chickens.

It has been shown that for every 24 hours of feed deprivation after hatching, the body weight of chickens at the end of fattening decreases by about 3%.

This is probably due to reduced feed intake, as feed intake decreases by the same value every 24 hours of feed deprivation.

The availability of feed and water promptly after hatching determines the outcome of chicken growth.



FEEDER SPACE

The provision of sufficient feeder space is an important and influential factor in the feeding behaviour of chickens.

According to the guidelines of various breeding companies, the recommended values for feeder space during the fattening period range from 1.5 to 2.1cm, 1.7cm and 2.5 to 5.1cm.

A recent study compared three feeder space areas (2.3, 4.6 and 6.9cm) on slow-growing chicken growth during fattening. The results demonstrated a direct correlation: in comparison to chickens with 2.3cm and 4.6cm, those with the highest feeder space (6.9cm) were 6% and 4% heavier at 28 days of age, respectively. Increased feeder space positively correlates with an improved growth rate in chickens.

Therefore, it can be recommended that chickens be provided with the maximum feasible quantity of feeder space.

FEED STRUCTURE

Except for the nutritional composition of a given mixture, feed structure is the most important feed property.

Chickens select their feed based on visual cues as well as their reflectivity and taste. Despite this, they possess a relatively low number of taste buds and use

mechanoreceptors located in their beaks to decide whether to accept or reject a feed particle.

Therefore, particle size can positively influence the feed intake of chickens.

When feeding a mash diet, current literature designates the optimal particle size as between 6 and 9mm, intending to maximise chicken growth. However, a 15–20% increase in feed intake and growth was noted in chickens fed a pelleted diet when compared to those fed a mash diet (Naderinejad et al., 2016).

The length and diameter of pellets also play an important role in optimising feed intake in broilers. The optimal pellet diameter for chicks up to seven days of age is up to 2mm.

Smaller pellets of up to 2mm have better quality and strength and are therefore less prone to crumbling during manipulation, a factor that can negatively impact feed intake.

In older broiler chickens, a diameter of 3mm can be recommended for optimal chicken growth.

A comparison of the effects of pellet length (3, 5 and 7mm) in broiler chickens until 21 days of age demonstrated that smaller particles had a significant positive impact on broiler performance. Chickens fed shorter pellets (3mm) exhibited 8–10% higher feed intake and 5–10% higher body weight gain from 7 to 21 days of age, in comparison to chickens fed longer pellets (5–7mm).

Given these findings, it can be

recommended that the optimal pellet length and diameter for chicken feed intake and growth are 3mm and 3mm, respectively, from 7 days of age onwards.

WHOLE GRAINS INCLUSION

One potential method for modifying the feed structure is to incorporate whole wheat grain into the feed mixture. This approach has been demonstrated to have positive effects on intestinal health, and it is therefore widely employed in poultry nutrition.

However, scientific literature has shown no correlation, whether positive or negative, between the use of whole grain and growth performance.

There are two ways to incorporate whole grains into pelleted feed: pre-pelleting and post-pelleting. In the pre-pelleting method, whole grain is incorporated into a pellet as a replacement for a portion of the ground grain normally used. In contrast, post-pelleting incorporation involves mixing and pelleting other feed ingredients (referred to as pelleted concentrate), after which the whole grain is blended with the pelleted concentrate.

A comparative analysis of the inclusion of ground wheat grain and whole grain in the diet of broiler chickens at various stages of development, from 1 to 42 days of age was conducted.

The results indicated that the inclusion of whole grain significantly decreased feed intake by 0.2–16% in broiler chickens.

However, the same study also found that the improved function (gizzard development and stimulation of digestive enzymes) of the gastrointestinal tract from feeding whole grain can result in improved feed efficiency, consequently leading to enhanced chicken growth.

To achieve the positive impacts of whole grain inclusion, several rules must be followed. Firstly, the gastrointestinal tract of young chicks until 7 days of age is not yet ready for whole grain inclusion; therefore, inclusion should happen after the first week of age.

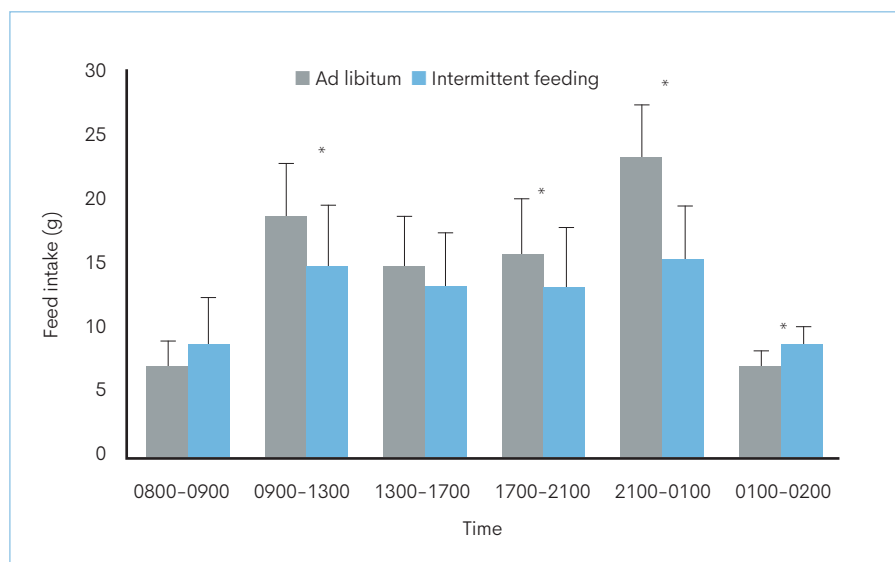


Fig. 1. Feed intake comparison of ad libitum and intermittent feeding programmes in 17-day-old broiler chickens during 18 hours of photostimulation. For intermittent feeding, feed was available only during the first hour of each given period. Values represent grams of feed per chicken.

Secondly, an acclimatisation period of at least one week must be performed before the full post-pelleting inclusion of whole grain. Finally, the rate of whole grain inclusion must be regulated to ensure that energy requirements do not increase as the gizzard begins processing the grain.

Current evidence indicates that the optimal inclusion rate is approximately 15%. Compliance with these rules can result in a 14.3% improvement in feed efficiency.

The incorporation of whole grains represents a promising approach to enhancing feed efficiency. However, given the observed reduction in feed intake, it can be postulated that the inclusion of whole grains does not fully optimise the growth of chickens.

FEEDING PROGRAMME

It is generally recommended to feed chickens ad libitum to maximise their feed intake and growth. In ideal environmental conditions, it can be recommended to feed chickens ad libitum because constant access to feed is related to a 4–10% higher feed intake and consequently a 3–4% higher body weight gain compared to intermittent access to the feed.

The effect of the feeding regime on broiler feed intake is presented in Fig. 1.

However, the birds are able to withstand periods of feed withdrawal thanks to crop protrusion, which serves as a feed reservoir during periods of no access to feed. In the case of heat stress, when increasing temperatures result in decreases in feed intake and body weight gain in chickens, an intermittent feeding programme may improve body weight gain.

In general, it is recommended to feed chickens at night when temperatures are

lower to support feed intake. However, an interesting study was published where broiler chickens were subjected to heat stress (30°C) from 11:00am to 17:00pm.

The first group had access to feed only at the same time, from 11:00am to 17:00pm, while the second group was fed ad libitum. The results demonstrated that the first group exhibited a 3–4% higher feed intake, a 5% higher average weekly gain, and a 4% higher live body weight at six weeks of age compared to the ad libitum-fed group.

Consequently, intermittent feeding represents a viable approach to enhancing chicken growth during periods of high heat stress. However, under ideal conditions, ad libitum feeding remains the standard method for maximising the growth of broiler chickens.

CONCLUSION

It can be concluded that the most effective method of feeding a flock to achieve optimal growth is to ensure that chicks are fed at an early age and that they have sufficient space to consume their food.

The structure of pelleted diets is also a crucial factor in achieving optimal feed intake and growth.

Finally, ad libitum feeding has been proven to be a method of feed administration that supports optimal growth.

In closing, it is vital to mention that all of these findings and recommendations rely heavily on the accuracy and reliability of available bird weight data.

Lacking such data severely limits the ability to effectively manage flocks in the ways mentioned above.

References are available from the authors on request



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Practical biosecurity measures to Help protect your flocks

It is commonly referenced that the most effective and valuable defence against disease in commercial poultry is biosecurity. Biosecurity is the application of measures that reduce the risk of disease agent introduction and dissemination.

By Lyndsey Cassidy, Senior Quality Assurance Specialist, Cobb Europe
www.cobbgenetics.com

Biosecurity measures offer the most effective preventative measures against a disease challenge when they're consistently applied, targeted to actively reduce localised risk(s) identified within and around individual sites, and effectively managed logistics into and between sites.

When considering key practices, a common resource for biosecurity program development is the 'three levels of biosecurity,' which feature conceptual, structural and procedural measures that are designed to mitigate disease introduction and transmission pathways.

CONCEPTUAL BIOSECURITY

Considerations related to a site's location

Conceptual biosecurity is considered the primary level of biosecurity and refers to the location of premises, considering localised risk(s) and the level of risk they represent. For example, consider if the following features are nearby (from 400m to 1km) of your sites:

- Open water sources/lakes/reservoirs/wetlands
- Local wildlife, especially waterfowl and game birds
- Other commercial and non-commercial poultry establishments or hobby flocks
- Slaughterhouse, animal sanctuary/zoo, animal feed mill, nature reserve, etc.



Fig. 1. Conceptual biosecurity, the primary level, considers localised risk(s) such as open water sources, roads, and proximity to other farms.

- Public roadways (significant if your site is in an area densely populated by other commercial poultry operations) Ideally, your site will be positioned in a secluded location with no high-risk features in close proximity, but this is not always possible.

Therefore, consider how to isolate your site with physical and practical measures such as restricted access barriers, fencing and signage, and controlled access points into the site for vehicles, personnel, equipment, and supplies. The goal is to keep your site contained within a secure biosecurity boundary. Additional controls, such as vermin and vegetation control measures, will further support efforts to keep localised risks out of your premises.

STRUCTURAL BIOSECURITY

Considerations related to the physical design and layout of a site and buildings

Structural biosecurity (secondary level of biosecurity) refers to physical features of your site, such as the perimeter fencing and site

access points, the site layout, the location of poultry houses and other biosecure buildings, the presence of hygiene facilities (showers, washrooms, etc.), and ventilation and drainage systems.

The site layout is a vital factor in coordinating traffic control measures, including:

- **Personnel:** all personnel access the site through a single, controlled access point secured and locked at all times.

The entry point for personnel should lead directly into the hygiene facilities.

Personnel should not be able to access the biosecure zone (clean area) before the necessary hygiene steps are taken (showering, changing into site-dedicated clothing, and Personal Protective Equipment (PPE).

- **Equipment and supplies (including bedding):** Supply and equipment intake should occur systematically, with the entry point controlled and complimented by a disinfection/sanitisation point to remove organic material or fomites before entering the biosecure zone. Secure, pest-proof, and

clean storage areas will help ensure your cleaned and sanitised equipment and supplies do not become contaminated during storage.

- **Poultry:** Poultry movements into and out of the site should occur through controlled routings, ideally outside the biosecure boundary. Doors leading into a poultry house should be robust and free from gaps, damage, and light leakage.

- **Hatching Eggs:** Store hatching eggs inside a temperature-controlled storage area with good hygiene measures to help ensure the movement of eggs from your site to a hatchery or customer does not represent a disease transmission route in your operation. Egg sanitation on-site supports a reduction in surface contamination and improved egg hygiene.

- **Vehicles:** Ideally, vehicle deliveries and collections should occur from outside the biosecurity zoning. If this is not possible, ensure vehicle entry points are well-defined and controlled, and

Continued on page 11

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Continued from page 9
permitted pathways through your site are minimised.

A disinfection point for vehicle decontamination is extremely advantageous for removing organic material and pathogens that may be present on the vehicle.

- **Animal by-product:** An animal by-product storage unit should be outside the biosecure zone, especially if an external contractor is responsible for animal by-product disposal. The area or building dedicated to animal by-product storage must be structurally sound, lockable, temperature-controlled, and offer a secure and hygienic method of containing all animal by-product materials before collection and disposal.

- **Water draining:** Standing water can serve as an attractant to wild birds and support insect growth. Poor water drainage also introduces hygiene challenges and environmental contamination issues. Ensure all drains are free of blockages, guttering pipes are in good condition and offer free-flowing drainage of wastewater in and outside of the site into secure tanks or drainage systems.

PROCEDURAL BIOSECURITY

The processes and procedures required during normal daily operation

Procedural biosecurity is the third level of biosecurity and focuses on daily procedures undertaken by staff members, approved contractors, and suppliers designed to prevent disease introduction (bio-exclusion) and spread (bio-containment) within a facility.

VISITOR AND STAFF PROCEDURES

- Recommended avian no-contact period of at least 72 hours.
- Staff must not own any avian species as pets, hobby birds, etc.
- Personnel must declare any contact with avian species and adhere to any additional biosecurity measures, including any out-time periods, before returning to work.
- Ensure all visitors agree to adhere to site biosecurity procedures and have not had contact with high-risk environments or avian species within at least 72 hours before visiting your site.
- Maintain personnel entry logs for staff members and visitors; personnel traceability is a valuable reference.

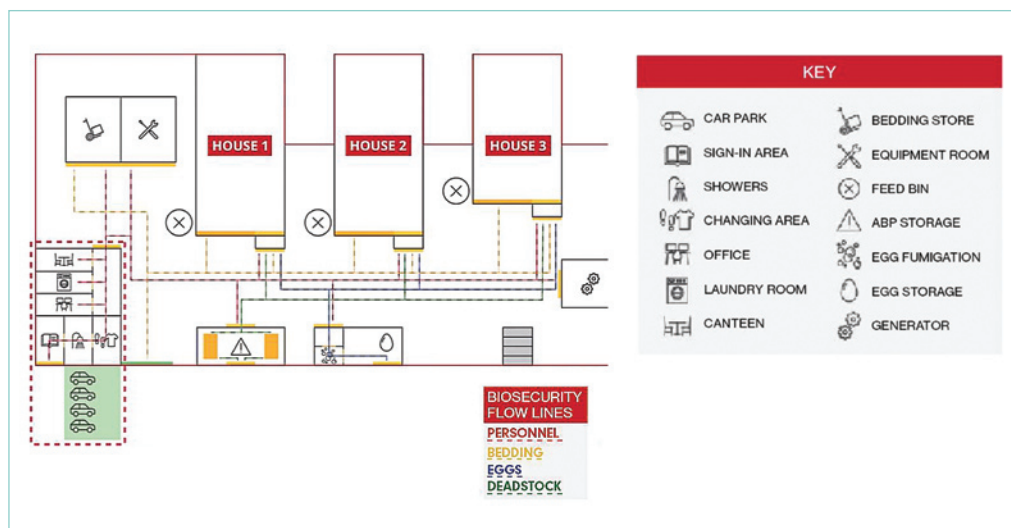


Fig. 2. An example of a biosecurity site plan as part of the structural biosecurity, the secondary level of biosecurity.

- Personnel are to remove all personal items, clothing, and footwear before entry into the biosecure zone and wear site-dedicated clothing and footwear only.
- Provision of disposable coveralls, footwear, and PPE for drivers entering the biosecure zone.

HYGIENE AND SANITATION PROCEDURES

- All personnel entering the site must pass through a hygiene barrier able to provide a full-body shower, using a nail brush, soap, and shampoo to remove any fomites.
- Cobb's standard for showering is a timed 5-minute shower before entry and, in the case of multi-aged premises, a 5-minute shower and clothing change between flocks.

- Use hand sanitiser before entering any biosecure building and poultry house, and hand washing to remove organic material.
- Presence of boot disinfection points before entry into a poultry house and biosecure building, regularly replenished with accurately dosed disinfectant.
- Disinfection of all approved, essential incoming items, equipment, vehicles, and supplies using accurately dosed disinfectants.
- Personnel compliance with boot barrier/boot changing systems in addition to any clothes-changing procedures on site.

BIRD PREVENTATIVE MEASURES

- Implement anti-perching spikes and devices in areas where birds can perch, such as buildings,

fencing posts, on top of light fixtures, or wall-mounted features.

- Use meshing across poultry house ventilation panels to reduce the risk of fomite introduction into a poultry house and prevent birds from nesting within or near ventilation inlets and outlets. For ceiling vents, meshing and drip trays offer a containment method for organic material, faecal matter, and fomites.
- Consider the use of visual and vocal bird deterrents and repellents, especially if your site is close to localised risks (refer to the conceptual biosecurity section).

ENVIRONMENTAL MANAGEMENT TO REDUCE WILD BIRD POPULATIONS CLOSE TO THE SITE

- Clear up any feed spills observed after each feed delivery.
- Keep vegetation well managed, trees at least 2 meters from any biosecure building.
- Remove all general rubbish and keep the farm environment tidy and well-organised.
- Clean and sanitise internal walkways if faecal contamination is observed.

Although no biosecurity program can completely protect a farm from disease challenges, biosecurity is a valuable prevention tool that can reduce the risk.

Biosecurity is a daily practice and a worthwhile investment for any poultry operation to adopt passionately and comprehensively.

As human error is the common cause of biosecurity breaches, invest in staff training and knowledge to emphasise the importance and value of their contributions to an effective biosecurity program.

Fig. 3. Procedural biosecurity is the third level of biosecurity and focuses on daily procedures designed to prevent disease introduction (bio-exclusion) and spread (bio-containment) within a facility.



Investigation of poultry droppings to get early warning of danger

Poultry droppings are an important tool for evaluating flock health status and for getting a very early signal of any outbreak or infestation.

by Writer: Abdullah Al MAMUN, Technical Support & Marketing Manager Asia
novogen-layers.com

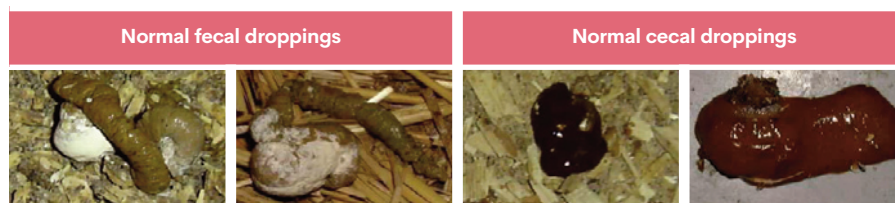
The monitoring of droppings on a daily basis has now become a smart management tool for sustainable farming. Professionals and practitioners agreed on the economic importance of early detection through continuous monitoring of the droppings on the floor or manure belt. Moreover, there is no doubt that to produce a clean egg, intestinal health is becoming a concern.

THE IMPORTANCE OF POULTRY DROPPINGS

Observation of droppings is a diagnostic tool for early intervention during bowel and/or caecal disease. Limiting economic losses associated with decreases in production (meat, eggs) before the onset of significant mortality.

When examining faecal or cecal droppings, it is important to assess:

- Water content (normal, moderate, aqueous, or very liquid during diarrhoea).
- Increased volume.
- Loss of consistency.
- Oily appearance.



Moderate change of faecal & cecal dropping
It is the first signal of intestinal disorder diarrheic



Diarrhoeic droppings with undigested feed particles & foamy cecal
Droppings signal for pathogenicity



Severe changes in droppings
indicating specific pathogenicity of the specific disease



Qualification of droppings?

- Colour change (especially the presence of melaena or fresh blood).
- Presence of undigested feed and/or abnormal smell.

It is important to observe droppings around the drinkers to be consistent. But, in addition to the prevention of skin diseases and pododermatitis) and early detection of enteritis in flocks.

The evaluation of the water content of manure ensures good litter quality (especially the prevention of skin diseases and pododermatitis) and early detection of enteritis in flocks.

This can be done using tools such as Elancobox. This tool includes a special absorbent paper placed on the litter and under a slatted box on which the birds will defecate.

This system provides a good assessment of the moisture content of droppings.

It is important to assess the water consumption of the flock to determine

Common causes	Less common causes	Rares causes
Heat stress	Raw soybean meal	Avian influenza
Vent prolapse	Hardware disease	Newcastle disease
Marek's disease	Mould toxins in feed	Toxic plants
Lymphoid leucosis	Excess salt in the diet	Chlamydiosis
Pullorum disease	Rotavirus or entero-like virus	Campylobacteriosis
Paratyphoid salmonella	infections	Listeriosis
Arizonosis	Infectious coryza	Histomoniasis
Colibacillosis	Fowl cholera	
Clostridiosis	Avian tuberculosis,	
Coccidiosis	Avian intestinal spirochetosis	
	Aspergillosis	
	Heavy infections with	
	threadworms	

Aspects	Origin	Common causes
Colour	Orange	Faecal or Caecal Orange tinge is caused by sloughing of the intestinal mucosa, and coccidiosis (<i>Eimeria maxima</i> or <i>E. acervulina</i>) with or without diarrhoea. First droppings after fasting, loss of carotenes and vitamins, and other
	Yellow	Faecal or Caecal Inclusion body hepatitis, avian enterovirus-like virus infection, histomoniasis (blackhead, brilliant yellow droppings, wasting, typhlitis); yellow to watery brown droppings; foamy: the problem of maldigestion and fermentation in ceca (undigested food, infection, parasites, etc.)
	Caramel	Faecal or Caecal With or without foam, foamy yellow brownish (or caramel) in <i>Brachyspira</i> spp. Infection, first stage of coccidiosis or some other parasites.
	Green	Faecal or Caecal Biliary origin: fasting, anorexia (related to disease); fat problem in feed (rancidity, quantity, absorption, etc.); Acute septicaemic diseases (avian Influenza, Newcastle disease, spirochetosis), hepatic diseases (clostridiosis, colibacillosis, etc.),
	Red (Blood)	Faecal or Caecal Acute hemorrhagic enteritis: coccidiosis (caecal coccidiosis due to <i>E. tenella</i>); Parasites, wounds, cannibalism, other
	Grey	Faecal or Caecal Malabsorption, mixture of bile and urates, antitrypsin factor [soya or rapeseed (Canola) undercooked], other
Other	Black (Tarry)	Faecal or Caecal Too warm temperature with excess water consumption (each °C above the comfort zone leads to an increase in water consumption by 10%); the presence of melena (digested blood); pellet binder "Lignosol FG"; excess fibre (e.g., wheat, barley)
	Undigested Feed	Faecal or Caecal Malabsorption, transit too fast, inadequate-size particles in the ration, other

Abnormal colour or composition of Avian droppings.

whether the 'aqueous' swelling of faecal droppings comes from overconsumption of water (in this case, non-pathological causes are to be sought) or intestinal damage with impaired reabsorption.

Both problems could occur at the same time. Many diseases are associated with diarrhoea, and its colour may or may not be specific.

For example, the green colour is caused by a bile pigment due to anorexia, and the white colour results from an excessive number of white urates in droppings (as the disease

progresses, the droppings slowly become white).

CONCLUSION

Poultry dropping is not waste; it is the evidence as well to understand chicken internal health, and therefore early detection is possible only on keen, regular observations. Finally, necessary measures could be possible through medication or nutritional actions accordingly. ■

Guidelines for changes of abnormal dropping.

Aspects	Origin	Characteristics
Changes in faecal or caecal droppings	Healthy	Faecal Small with a white urate cap, rather melded, usually has a down feather attached to it, has no sign of wetness surrounding it; no smell, dry, colour greenish brown, absence of mucus or undigested grains.
		Caecal Varies in colour (can be dark almost black/brown), firm and smooth, viscous, smelly
	Red flag	Faecal Increased size, beginning of destructuration, oily, increased moisture
		Caecal Watery, loss of consistency, foamy, colour change, early caecal dysfunction
	Bad	Faecal Watery, lost firmness, undigested feed, may have orange mucus
		Caecal Foamy, colour change, liquid, no consistency
Danger	Faecal	Watery diarrhoea, undigested feed, mucus, necrotic material, and/or blood
	Caecal	Very foamy (mousse), spread, colour change, liquid

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Options for



Equal pressure ventilation for poultry

Equal pressure ventilation is specifically needed in free-range poultry layer houses. To keep the ventilation from coming in through the popholes, the TPI equal pressure ventilation chimneys can be used.

www.tpi-polytechnik.com

These ARC-type chimneys keep the pressure inside and outside the house the same. The airflow is still present, and fresh air circulates taking the dirty air out via the chimneys.

In Habscheid, Germany, a series of TPI equal pressure ventilation chimneys were installed in a new poultry house. These chimneys make use of a recirculation element. The recirculation functionality is mostly used during colder days and saves on heating costs.

Key advantages of equal pressure ventilation systems are:

- Very precise control over the ventilation capacity and therefore climate.
- Usable in houses that are not completely sealed off, like free-range houses.
- Strong system in wintertime where recirculation helps save on heating costs.
- Equal spread of fine dust over the house, no piles of dust in corners.

As this is a free-range poultry house with popholes the use of regular ventilation based on negative pressure was not suitable in this instance; however, TPI has a variety of ventilation chimneys suitable for use in free-range houses. The recirculation chimney is available in various

configurations for different houses and solutions.

Their recirculation chimneys are built with a fixed or dynamic set-up. Next to these standard models, TPI can supply components to build or assemble a chimney to your specific needs.

UV disinfection instead of antibiotics

The frequent use of antibiotics can pose potential health risks to animals and humans.

www.fraunhofer.de

With the help of a compact device that combines several processes, including UV disinfection, photocatalysis, and particle filtration, researchers at the Fraunhofer Institute of Optronics, System Technologies, and Image Exploitation IOSB, Institute for Advanced Systems Technology (AST) have been working alongside their partners to sustainably reduce the use of antibiotics while improving the air quality in barns to promote animal welfare.

UV disinfection, photocatalysis, and particle filtration have been combined with several processes that sterilise and remove harmful chemical compounds in the form of an innovative portable device that can be attached to the ceiling, for example.

This device should reduce the incidence of infectious diseases that require treatment with



Energy-efficient ventilation in poultry production

Dynamic MultiStep by SKOV is an innovative control principle suitable for most ventilation systems that could save up to 50% power.

www.skov.com

Fan Regulation and grouping
Conventional ventilation systems typically run each fan at full capacity, regardless of the actual

ventilation requirements. This method can result in excessive energy usage. However, Dynamic MultiStep utilises a different approach.

In this system, fans are grouped and operate at around 50% of their maximum capacity. When two fans run at 50%, they use a small fraction of the energy of one fan running at 100%.

Adaptive adjustment

Dynamic MultiStep is integrated with the controller to monitor indoor climate conditions continuously.

Instead of turning fans to 100% one by one, Dynamic MultiStep gradually adjusts the fan speed. It activates more fans in parallel, but each fan operates at a lower output level. This gradual adjustment minimises sudden energy spikes and significantly reduces noise levels.

Energy Savings and Animal Comfort

The Dynamic MultiStep system's main advantage is its significant energy savings.

This is achieved by operating multiple fans at reduced speeds to maintain the required level of ventilation but using much less electricity in the process.

Moreover, this system ensures that animals are kept in optimal climate conditions, safeguarding their comfort and overall well-being.

Environmental impact and noise reduction

The Dynamic MultiStep system promotes sustainability and enhances well-being in livestock facilities. Significantly reducing energy consumption directly lowers CO₂ emissions, contributing to environmental protection.



Environmental control, proper hygiene and disinfection

BioOx Air Cleaning System is a first-of-its-kind bioreactor that captures and destroys airborne pollutants using their patented biotechnology.

bioox.us

The system uses the power of bio-oxidation, and there's not a single HEPA, UV, or ionic-based system on the market that offers complete localised air decontamination like this. While other systems struggle to filter out 0.3 microns, their bio-reactors offer complete contaminant destruction down to 0.0001 microns. They can clean air in large square footage facilities, such as poultry processing facilities.

The bio-reactors both capture and destroy chemical contaminants. For example, ammonia is a chemical commonly found in poultry houses since it is created when the nitrogen in poultry faeces is broken down by bacteria. Exposure to high ammonia concentrations

negatively affects the development of the birds' immune system, as well as their intestinal histomorphology. In their comprehensive, 20 day study with 20,000 chickens per house, the house with the BioOx Air Cleaning System running saw a 48% reduction of measured ammonia with the same vent time and vent box opening as the control house without their Air Cleaning System (both houses were identical in age and size). Furthermore, the house that used their Air Cleaning System saw a 32% reduction in mortality over the control house without BioOx in their study.

Their BioOx Cleaning Systems respond quickly to real viral and bacterial epidemiological outbreaks spread via air. Various experiments have proven that BioOx is effective with pathogen destruction (H1N1, Legionella, Influenza B, and MRSA were studied).

Additionally, Avian flu has generated headlines recently and is a viral disease that can cause sickness and death among poultry.



One of the highest airflow ratings in the industry

Chore-Time offers poultry producers a full line of products for environmental control of poultry houses. The latest introduction to the line is the new EnduraMax Direct-Drive 57-inch Fan.

www.choretime.com

Chore-Time's EnduraMax Fan combines high airflow and variable-speed energy efficiency with corrosion-resistant materials for simple, long-lasting, high performance. It produces one of the highest airflow ratings in the industry, as well as providing very consistent airflow as the wind speed varies.

Direct-drive technology reduces the amount of moving parts, eliminating belts, pulleys, and bearings, which naturally minimises maintenance requirements. Furthermore, the

direct-drive design itself promotes efficiency, which leads to energy savings. Combined with the ability to automate variable speed programming, efficiency and bird comfort are maximised when used with Chore-Time's Catalyst Control, which can control fan speed automatically.

The fan's Hyflo Shutter is designed to further improve fan output and efficiency by minimising obstructions during fan operation. Hyflo Shutters don't suffer the typical 12-15% loss of efficiency and air speed that is common with dirty louver-style shutters. This means air speed is better maintained at the end of the flock, where it's needed most. The shroud and shutter doors contain 35% fibreglass for extra strength. Also, the black HDPE (high-density polyethylene) cone aids in light control.

Creating a comfortable, constant indoor climate

The ECO Air Care system from Vencomatic is a low-emission barn system that starts working the moment fresh outside air reaches the unit by conditioning this air before it enters the poultry house.

www.vencomaticgroup.com

Without external energy sources, the ECO Air Care system cools or heats the air entering the unit. This creates a comfortable, constant indoor climate, optimal for both animals and humans.

Natural chicken behaviour

Scratching and dust bathing in litter is natural chicken behaviour. This releases ammonia (mainly nitrogen) and particulate matter

into the air inside the poultry house. The ECO Air Care system removes these substances through ventilation, ensuring optimum air quality, which is better for the chickens' health and welfare.

The outgoing air from the poultry house is "washed" in the ECO Air Care system to minimise environmental pollution, including

nitrogen. The acidified washing water contains dissolved nitrogen. We call this drain water.

Through the ECO Air Care unit, this is discharged to a storage silo.



24/7 measuring

The ECO Air Care system ensures a continuous supply and removal of air to keep the quality of the poultry house climate as optimal and constant as possible. Of course, it is important to ensure that the outgoing air is as clean as possible.

That is why it is measured in three independent ways, 24/7.

Through these measurements, it proves conclusively that the nitrogen captured is dissolved in the drain water and that up to 90% cleaner air is released into nature.

Mycotoxins in poultry – External signs can give you a hint

Part 1: Impact on Feathering

Mycotoxins are known to decrease health and performance in poultry production. Their modes of action, such as reducing protein synthesis and promoting oxidative stress and apoptosis, lead to cell destruction and lower cell replacement, affecting several organs and tissues.

By Dr. Inge Heinzl, Editor,
and Marisabel Caballero,
Global Technical Manager,
EW Nutrition
ew-nutrition.com

When different stress factors collude, such as high temperatures and humidity, poor ventilation, high stocking density and management events, the effects of in-feed mycotoxins can reach a higher level, which may include external signs.

The most commonly recognised external sign of mycotoxicosis is mouth lesions caused by trichothecenes, which are highly associated with the presence of T-2 in the feed. However, other signs may appear, such as paleness of combs, shanks, and feet, as well as leg problems, ruffled feathers, poor feather coverage, feed passage, and abnormal faeces.

In this series of articles, we will report on external signs facilitating a differential diagnosis of mycotoxin contamination. This is necessarily followed by feed or raw material mycotoxin analysis and strategies to avoid or mitigate the effects of mycotoxin contamination in poultry production.

A HEALTHY PLUMAGE IS CRUCIAL FOR GROWTH AND REPRODUCTION

Feathering is a crucial aspect of poultry health and productivity. Feathers are essential for thermoregulation, locomotion, adequate skin protection, and reproductive success, protecting hens from injury during mating. Inadequate feathering can lead to



lower feed efficiency as well as loss in fertility and chick production. Mycotoxins in poultry feed can compromise feather quality in poultry production animals. This first article delves into the relationship between mycotoxins and poor feathering, exploring different mycotoxins and their mechanisms of action.

IN WHAT WAY DO MYCOTOXINS COMPROMISE FEATHERING?

On the one hand, chronic mycotoxin exposure impairs the digestive process, hindering the absorption and utilisation of vital nutrients essential for feather growth. This disruption can lead to malnutrition, directly impacting the quality and health of feathers. On the other hand, mycotoxins also interfere with metabolic processes critical for feather development, such as keratin synthesis.

Enzymatic pathways involved in synthesising keratin, the protein building block of feathers, are particularly vulnerable to mycotoxin-induced disruptions. The presence of mycotoxins in feed has been associated with the manifestation of sparse feathering and the sticking out of feathers at an unnatural angle.

In the case of multiple mycotoxins occurring in the feed, even at singularly unimportant concentrations, a negative impact on feathering is possible.

Different mycotoxins have different target organs and consequences for the animal, so their ways of compromising feathering also vary.

As feathering needs protein availability, all mycotoxins affecting the protein metabolism or the absorption of nutrients also impact the feathering process. Let us look at the most prominent mycotoxins.

1. T-2 TOXIN

Due to climate change, T-2 toxins are on the rise. In the US, more than 50% of the tested samples contained T-2 toxin; in Europe, we found it in 31%, and in China, in 82% of the samples. The highest level was found in Europe, with 850ppb.

Adverse effects of T-2 toxin in goslings were shown when the animals were exposed to 6 different levels of T-2 toxin, from 0.2 to 2.0mg T-2 toxin/kg of feed. The goslings showed a sparse covering with short, dry, rough, curly, and gloss-free feathers on their back with dosages ≥ 0.8 mg/kg.

When zooming in, T-2 can cause necroses

of the layer of regenerative cells in the feather base, implying malformation or absence of new feathers, as well as structural damage to existing feathers on the base of the ramus and barb ridges.

The effects in feather regenerative cells are dose-dependent, as confirmed when different doses of T-2 toxin (1.5, 2, 2.5, and 3mg/kg body weight/day) were applied to 7-day-old broilers for 14 days.

Delayed feather development, especially at high dosages, was noticed, as well as malformations and opaque bands in the feathers, the latter probably caused by a segmental reduction in diameter.

It was noticed that feather malformations when broiler chickens were challenged with 0.5ppm T-2 toxin in the feed in combination with an inoculation of 2.4×10^8 cfu *Mycoplasma gallisepticum*. When the chickens were challenged only with T-2 toxin, the feathers were ruffled, showing that a coincidence of stress factors even aggravates the symptoms.

2. AFLATOXINS

Aflatoxins, produced by certain *Aspergillus* species, are among the most notorious mycotoxins. Looking at test results of the last year, Aflatoxin shows incidences between 25 (USA) over 40–65% (Europe, LATAM, MEA, and SEAP) up to 84–88% (China and South Asia) with average levels up to 42ppb in South Asia.

However, more information about the concrete impact of aflatoxins on feathering is needed. They may indirectly affect feathering because they impact digestion and the utilisation of nutrients or trace minerals such as zinc, which is essential for the feather construction process.

Damage to the liver impacts protein metabolism, and keratin is also necessary for feather production.

In other studies 5mg AFB1/kg was fed to Arbor Acres broilers, and the birds showed ruffled feathers. A significantly lower feather shine was noticed when the animals were given 300µg AFB1/kg of feed, and other birds showed ruffled, broken, dull, and dirty feathers after six weeks of feeding an aflatoxin-contaminated diet.

3. OCHRATOXIN

Ochratoxins, commonly produced by *Aspergillus* and *Penicillium* fungi, also pose a significant threat to poultry. When looking at the mycotoxin report, this mycotoxin was found in 16% (Europe) to 70% (SEAP) of the samples.

Ochratoxins primarily affect feathering by compromising the structural integrity of feathers and causing delayed feathering in broilers.

Several trials have shown the negative impact of ochratoxin on feather quality.

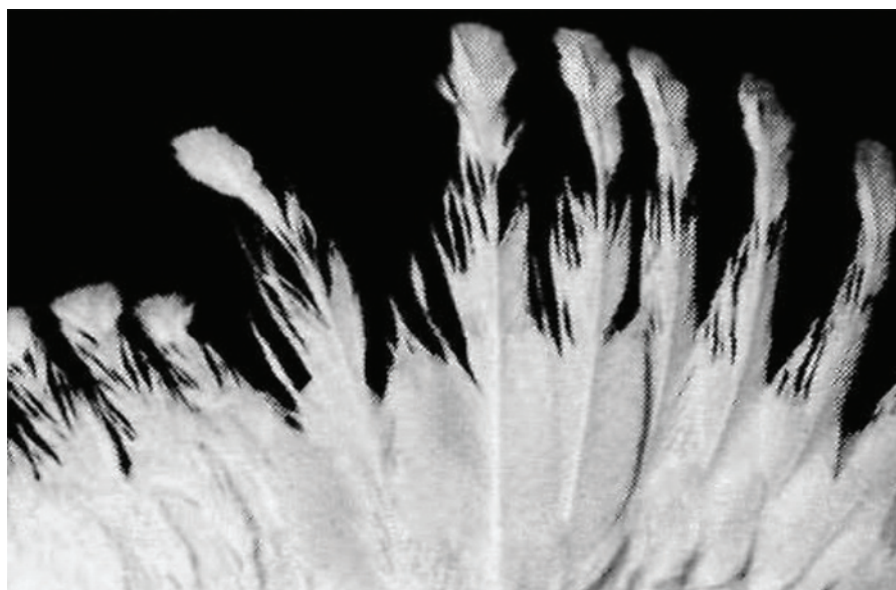


Fig. 1: Feathering affected by scirpenol mycotoxins.

Laying hens were fed OTA and showed a dose-dependent (dosages from 0 to 10mg/kg feed) occurrence of ruffled and broken feathers in the OTA group, whereas the plumage of the control group was shiny and wellformed. It was also realised dull feathers when feeding 0.4 and 0.8mg OTA per kg of feed.

A further dose-dependent decrease in feather quality was described in broiler chicks. After injecting them with dosages from 0.1 to 1.7mg/kg body weight on day 5 of age a deterioration of feather appearance (rippled feathers) was seen in the groups with the higher dosages of 1.3 and 1.7mg/kg. A similar dose-dependent deterioration of the feather quality in white Leghorn cockerels was observed when feeding 1 or 2mg OTA/kg feed.

Combinations of aflatoxins and ochratoxins were also tested.

Mouldy feed naturally containing 56µg OTA and 136 µg AFB1 per kg was fed to layer hens and saw a deterioration of feather quality with increasing feeding time. Ruffled feathers when feeding a diet naturally contaminated with 800ppb of OTA and 100ppb of AFB1 was noticed.

4. SCIRPENOL MYCOTOXINS

After feeding graded levels of fusarium mycotoxins to broiler chicks until three weeks of age, they discovered that the impact of scirpenols stretched across the entire feathered body parts and that the degree of feather alteration is dose-dependent.

The main alteration was a frayed or even missing web on the medial side of the outer end of the feather due to poor development of the barbs, barbules, and barbicels, and the tip of the feathers became square instead of rounded – the thinner and weaker shafts of the feathers inclined to show an accentuated

medial curve. In their trial, Parkhurst and Hamilton realised that 15-monoacetoxyscirpenol (15-MAS) caused the most severe alterations of feathers, and they determined a minimum effective dose (MED) of 0.5 µg/g diet. The MEDs for 4,15-diacetoxyscirpenol (4,15-DAS) and 3,4,15-triacetoxyscirpenol (TAS) were higher, 2µg/g and > 8µg/g, respectively.

HOW CAN WE ENABLE ADEQUATE FEATHERING IN POULTRY?

Adequate feathering of poultry is necessary for the animal's health and welfare and to ensure fertility and productivity. The occurrence of mycotoxins in the feed – and the probability is high! – can cause poor feathering or the development of malformed feathers. To best equip broilers, layers, and breeders, their feed must contain all nutrients essential for healthy growth and appropriate feathering.

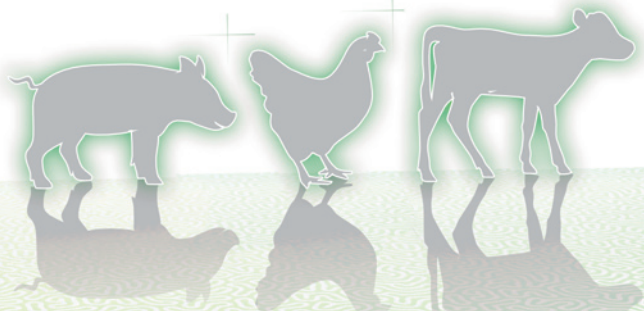
As the risk of contamination of the feed materials is very high (see EW Nutrition's mycotoxin report 2023), it is of crucial importance to have an efficient mycotoxin risk management in place, which includes sampling, analysis of samples, and the use of mycotoxin binders.

EW Nutrition offers MasterRisk, an online tool where farmers and feed millers can feed the results of their feed analysis concerning mycotoxins and get a risk management recommendation. ■

References are available
from the authors on request

In the next part of the series, we will report
on beak lesions and skin paleness, two
other external signs of mycotoxin
contamination

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INDUSTRY QUESTIONS ANSWERED

The role of precision weighing in advanced poultry management

In the dynamic field of poultry farming, precision in weighing any type of bird is not just a luxury but a necessity for ensuring flock health and maximising productivity.

Q1: WHY IS UNIFORMITY CRUCIAL IN FARMING BROILERS AND BROILER BREEDERS?

Uniformity in flocks of broilers and parent stock is essential for assessing balanced growth and development. It confirms that all birds have equal access to nutrition and care, leading to a healthy, productive flock. Advanced weighing systems like the BAT1 and BAT2 Connect scales play a crucial role in ascertaining this uniformity. These scales provide accurate, real-time weight data, enabling farmers to quickly identify and address any deviations in growth patterns across the flock. This level of precision in monitoring and managing uniformity is vital for optimising overall flock performance and avoiding potential penalties.

Q2: WHAT DOES THE COEFFICIENT OF VARIATION MEAN, AND WHY IS IT IMPORTANT?

The coefficient of variation (CV) is a statistical measure of the dispersion of weight data in a flock. It helps in assessing the uniformity and overall health of the flock, especially when determining the optimal point at which to increase exposure to light. The lower the CV, the more uniform the flock. Utilising precise, consistent weight data from specialised scales like BAT1 and BAT2 Connect can significantly aid in maintaining a low CV. These scales help accurately track weight variations, allowing farmers to make more effective management decisions for flock uniformity and health.

Utilising precise, consistent weight data from specialised scales like BAT1 and BAT2 Connect can significantly aid in maintaining a low CV.

Q3: WHAT IS FLESHING SCORE?

The fleshing score offers a comprehensive view of a bird's overall health and development. As pullets mature, their fleshing conformation undergoes changes, influencing their laying performance. Birds with identical weights can vary in frame size, fleshing, and fat reserves. Fleshing score can only be determined by physically handling each bird so this is usually done while manually weighing samples of birds from a flock. In addition, certain manual poultry scales, like the BAT1, make it easy to record these values and implement them into statistics and reports.

Q4: WHY IS ACCURATE WEIGHING ESSENTIAL FOR EFFECTIVE FEEDING?

Accurate weight data is fundamental in determining the success of a given feeding strategy. Inaccuracies in this data can mask overfeeding or underfeeding, either of which can massively affect a flock's overall performance. By referencing reliable weight data from specialised poultry scales like the BAT1 and BAT2 Connect, farmers are able to effectively tailor a feeding program to the needs of a specific flock. This precision in feeding not only optimises growth and production but also mitigates waste, yielding higher profits as well as improved sustainability.

Q5: HOW DO BAT1 AND BAT2 CONNECT SCALES ENHANCE POULTRY WEIGHING?

The BAT1 and BAT2 Connect scales offer innovations to enhance the poultry weighing process as well as the usefulness of the resulting data. These scales offer high accuracy and consistency in measurements, crucial for monitoring the growth and health of the flock. Their user-friendly interface and connectivity options allow for easy data management and analysis, including integration into any farm management system. Furthermore, their robust design ensures durability in the demanding farm environment, making them a reliable tool for effective long-term flock management.

CONCLUSION

Precision in weighing is a cornerstone of successful poultry management. The integration of advanced technologies like BAT1 and BAT2 Connect scales into daily weighing practices marks a significant step forward in the industry. These tools not only provide accurate and reliable data but also streamline the management process, leading to healthier flocks and improved productivity. Embracing these innovations is a way for farmers to keep up with the industry and drive profits from their operations.

PETR LOLEK
Sales Manager
VEIT Electronics



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Focus on Research

Metabolisable energy value of fat and meals obtained from black soldier fly larvae

An experiment (Poultry 2024, 3, 298–306, Chobanova, Karkelanov, Mansbridge, Whiting, Tukša, Rose, Pirgozliev) was conducted to determine the apparent metabolizable energy (AME) and nitrogen-corrected AME (AMEn) of defatted black soldier fly larvae meal (BSM), full-fat dry larvae meal (BSL), and larvae fat (LF) for broiler chickens. The BSM, BSL, and LF contained on a g/kg basis, respectively, crude protein, 459, 399, 0; crude fat, 171, 240, 923; dry matter, 963, 940, 997; neutral detergent fibre, 210, 333, 0; acid detergent fibres, 95, 93, 0; and gross energy (MJ/kg), 22.04, 22.78, 38.16.

An AME bioassay was performed wherein broilers were fed four experimental diets (a maize–wheat–soy basal diet and three test diets containing 100 g/kg BSM, BSL, or LF, respectively). The AME of BSM, BSL, and LF was calculated based on the differences between the AME values of basal and test diets (substitution method). The AME and AMEn for BSM, BSL, and LF were determined to be 18.20 and 17.40; 17.60 and 16.50; and 36.50 and 35.60 MJ/kg DM, respectively.

There were no significant differences ($p > 0.05$) between nutrient retention coefficients of dry matter, N, and fat. The results showed that the examined products from black soldier fly larvae are a good source of available energy and crude protein (BSL and BSM) and can be incorporated in broiler diets as alternative protein and energy sources.

Assessing the Effects of Phytogenic Feed Additives on Broilers during a Necrotic Enteritis Challenge

Subclinical necrotic enteritis (NE) is an enteric disease that inflicts significant economic losses in the poultry industry, primarily by reducing performance in commercial flocks but without significant mortality. This study (Poultry 2024, 3, 346–353, Blue, White, Dalloul) evaluated the effects of a variety of phytogenic blends on broilers' performance and carcass composition during an induced NE challenge.

In this study, 1120 day (d)-old male broilers were allocated to four treatments groups (14 replicate floor pens, 20 birds/pen): the control (CONT) group, fed a basal corn–soybean diet, and three phytogenic blend dietary additives (PHYTO1, PHYTO2, and PHYTO3) added to the basal diet at 150, 250, and 500 mg/kg feed, respectively. Subclinical NE was induced by spraying a concentrated coccidiosis vaccine onto the feed and litter 24 h post-placement. On day 8, two birds/pen were necropsied for NE lesions.

On days 8, 14, 28, and 42, the average daily gain (ADG), feed intake (ADFI), and feed conversion ratio (FCR) were calculated. On day 42, two birds/pen were euthanized to assess carcass composition using dual-energy X-ray absorptiometry (DXA). Statistical analyses

for all data were performed using the ANOVA procedure (JMP, Pro 16) and significance ($p \leq 0.05$) between treatments was determined by the LSD test.

There was no effect of treatment on NE lesions. PHYTO1, PHYTO2, and PHYTO3 significantly improved FCR from days 9 to 14, 0 to 14, and 0 to 42 and resulted in greater ADG from days 9 to 14, 29 to 42 and cumulatively on days 0 to 42. Carcass composition data revealed a numerically higher lean-to-fat ratio in the PHYTO groups compared to the CONT group. These results indicate that the dietary supplementation of phytogenic blends could alleviate the adverse effects of NE challenge on broilers' performance and carcass composition.

Evaluation of Increasing Levels of Acacia mearnsii Tannins on Growth Performance and Intestinal Morphometrics of Broiler Chickens Undergoing a Salmonella Heidelberg Challenge

The objective of this experiment (Poultry 2024, 3, 284–297, Maysonnave, Brutti, Silva, Stefanello) was to evaluate the effects of increasing dietary supplementation of tannins from Acacia mearnsii on the intestinal morphometrics, litter moisture, and growth performance of

broiler chickens. A total of 1400 Cobb 500 one-day-old male chicks were randomly distributed into five dietary treatments with eight replicates (35 birds/pen) until 42 days of age. The treatments consisted of Salmonella Heidelberg-challenged groups supplemented with 0, 300, 500, 700, or 900 mg/kg tannin from Acacia mearnsii.

A four-phase feeding program was used with pre-starter, starter, grower, and finisher feeds. At 3 days of age, birds were orally gavaged with an S. Heidelberg culture. Feed intake, body weight gain (BWG), and feed conversion ratio (FCR) were evaluated until day 42.

The morphometry of duodenum, jejunum, and ileum was measured at 7 and 42 days of age. From 1 to 28, 1 to 35, and 1 to 42 days of age, tannin supplementation for broilers under S. Heidelberg challenge led to quadratic increases ($p < 0.05$) in BWG, with optimal responses at 265, 412, and 456 mg/kg, respectively. No effects of tannin were observed on FCR in all periods.

Villus height was similar in all segments on day 7 ($p > 0.05$); however, on day 42, tannin supplementation that improved villus height of the ileum was 600 mg/kg ($p = 0.0100$). In conclusion, tannins from Acacia mearnsii were able to improve body weight gain and intestinal morphometry of broiler chickens under an imposed challenge of S. Heidelberg.

Expression of Immune Genes and Leukocyte Population in the Conjunctiva, Harderian Gland and Trachea of Chickens Inoculated with a Live Vaccine and a Field Strain Infectious Laryngotracheitis Virus

This pilot study (Poultry 2024, 3, 399–408, Tran, Andronicos, Gerber) evaluated the gene expression of immune markers and cell populations in the conjunctiva, Harderian gland and trachea of chickens inoculated with a chicken embryo origin vaccine (SA2) and a virulent ILTV field Class 9 strain to correlate these responses against clinical signs of disease and virus DNA load.

The findings in this study elucidated the differences in the profile of the key immune components stimulated by the Australian vaccine and field strains.

Changes in leukocyte populations and immune gene expression associated with attenuated vaccine (SA2) or field (Class 9) strains of infectious laryngotracheitis virus in chicken pullets were observed primarily in the trachea and conjunctiva, while no

Evaluation of dietary supplementation of a multi-carbohydrase enzyme complex on growth performance

The present study (Poultry 2024, 3, 307–317 Leyva-Jimenez, Jiral, Grimes, Rocha, Soto, Burden, Dirks, Archer) investigated the effect of supplementing a multi-carbohydrase enzyme complex (MCE) in corn–soy–based diets of Pekin ducks. The treatments were as follows: positive control (PC, 2,980 and 3,120 kcal/kg for starter and grower, respectively); negative control (NC, -132 kcal/kg energy reduction to PC achieved by reduction of fat and wheat middlings as filler); NC + MCE at 75 ppm (E75); 100 ppm (E100); and 125 ppm (E125) randomly distributed in 10 replicate pens with 25 birds each.

Performance was evaluated after 14 and 35 d. On day 36 of the trial, five ducks/pen were processed to evaluate carcass traits. During days 1–14, the PC had a lower ($p < 0.01$) feed intake compared to all other treatments. At 14 and 35 d of age the NC decreased ($p < 0.001$) the body weight (BW) of the ducks compared to the PC by -8.3% and -5.3%, respectively. The NC BW was lower ($p < 0.001$) compared to all MCE-supplemented treatments at 14 and 35 d.

The BW of E75, E100, and E125 treatments was not different ($p > 0.05$) from the PC at both evaluation periods. Cumulatively (1–35 d), the NC resulted in a weight-adjusted FCR increase ($p = 0.001$) of 9.9% compared to the PC, and the FCR of E75, E100, and E125 were able to recover 72.3%, 66.4%, and 63.5%, respectively, compared to the PC.

The carcass and breast weights were lower ($p < 0.001$) in the NC compared to all other treatments, and no differences ($p > 0.05$) were observed between the MCE-supplemented treatments and the PC.

In conclusion, these results suggest that the MCE supplementation can maintain duck growth performance with no negative effects on carcass traits in energy-reduced corn–soybean meal-based diets. From the results of the trial, 75 ppm MCE delivered the best performance recovery and 125 ppm MCE supplementation had the best % breast yield.

substantial changes were detected in the Harderian gland.

Although there were no significant differences in cellular infiltration in the tissues exposed to Class 9 and SA2, Class 9 induced greater changes in immune gene expression than SA2 in the trachea and conjunctiva and significantly upregulated CD4, CD8A, IRF1, STAT4 and downregulated CXCL12 expression in the trachea. Meanwhile, SA2 significantly upregulated CD14 and downregulated MPO, CCR6 and RAG1 expression in the conjunctiva.

In conclusion, gene expression in pullets infected with SA2 and Class 9 were mostly related to inflammatory and tissue-repairing responses in the trachea and conjunctiva. Compared to SA2, Class 9 inoculation was associated with a more robust gene expression of immune markers; however, a larger infiltration of Kul01+, Bu1+ and CD8a+ cells was observed in trachea and conjunctiva after SA2 inoculation.

Use of a Mobile Methodology for the Bio-Mapping of Microbial Indicators and RT-PCR-Based Pathogen Quantification in Commercial Broiler Processing Facilities in Honduras

This study (Poultry 2024, 3, 330–345, Betancourt-Barszcz, Blandon, Vargas, Bueno López, Chavez-Velado, Sánchez, Larios, Espinoza-Rock, Bueno-Almendarez, Sanchez-Plata) focuses on the development of a preliminary microbiological baseline of microbial indicators, including total viable counts (TVC), Enterobacteriaceae (EB), and the quantification and detection of pathogens such as Salmonella and Campylobacter spp. in four commercial broiler processing facilities in Honduras. Whole chicken and wing rinses were collected from four poultry processing plants at different locations: live receiving, rehanger, post-evisceration, post-chiller, and wings.

The MicroSnap system was used for the

enumeration of microbial indicators, the BAX-System-SalQuant was used for the quantification of Salmonella, and the BAX-System-CampyQuant was used for Campylobacter spp. Negative samples after enumeration were tested with BAX-System Salmonella and BAX-System Campylobacter for prevalence analysis, respectively.

The TVC and EB counts were continuously reduced from the live receiving to the post-chiller location, presenting a statistically significant increase ($p < 0.01$) at the wings location. The Salmonella counts were significantly different between stages ($p < 0.01$). The prevalence of Salmonella was highest in the live receiving stage, with 92.50%, while that at the post-chiller stage was the lowest, at 15.38%.

Campylobacter spp. counts were lower than that at the other stages at wings 1.61 Log CFU/sample; however, Campylobacter spp.'s prevalence was higher than 62.5% in all stages. Microbial bio-mapping using novel technologies suitable for mobile applications was conducted in this study to establish statistical process control parameters for microorganisms.

A nationwide microbial baseline for commercial broiler processing facilities in Honduras was developed. In-country data serve as a benchmark for continuous improvement at each facility evaluated and can assist regulatory officers in the development of risk-based performance standards aimed at reducing the risk of exposure to consumers.

Effect of Different Feed Structures and Bedding on the Horizontal Spread of Campylobacter jejuni within Broiler Flocks

In this study (Agriculture 2013, 3, 741–760, Skånseng, Svihus, Rudi, Trosvik, Moen) we investigated the effects of different feed structures and beddings on the spread of *C. jejuni* in broiler flocks, and the effect on the cecal microbiota.

Broiler chickens raised in 24 eight-bird group cages on either rubber mat or wood shavings were fed either a wheat-based control diet (Control), a diet where 50% of the ground wheat was replaced by whole wheat prior to pelleting (Wheat), or a wheat-based diet, such as the control diet diluted with 12% oat hulls (Oat).

Samples from the cloacal mucosa of all birds were taken daily for *C. jejuni*

Continued on page 22

Focus on Research

Pathological and ileal microbiota findings in seven-day-old chicks

Gizzard erosion and ulceration (GEU) is characterised by defects and necrosis in the koilin layer, particularly in broilers. This condition has been associated with growth retardation, runting, and economic implications for poultry producers; nevertheless, its influence on gut microbiota remains unknown. This study (Poultry 2024, 3, 409–419, da Silva, Cordeiro, Rios, de Freitas Neto, Lara, Oliveira, Aburjaile, Ecco) investigated the compositional changes in the bacterial community of the ileum of seven-day-old broiler chicks with GEU using next-generation sequencing (NGS) technology.

Twenty-two samples were obtained from the ileal mucosa and contents of sixteen chicks with GEU and six without GEU raised in a conventional system located on a farm in southeast Brazil. The results revealed that bacterial phyla in both groups exhibited a similar composition, with Firmicutes representing the most abundant. *Porphyromonas*, *Candidatus Arthromitus*, and *Limosilactobacillus* were statistically more abundant in the group without GEU.

The most prevalent genera in the group with GEU were *Lactobacillus* and *Enterococcus*, and the relative abundance of *Enterococcus* in the ilea of some chicks with GEU was considerable. Based on the results of the current study, necrosis in the koilin layer can change the composition of ileal microbiota. Therefore, further studies should be carried out to clarify whether GEU and consequently poor digestibility of the feed cause significant changes in the intestinal microbiota.

Continued from page 21

quantification and cecum samples were collected at the end of the experiment for *C. jejuni* quantification and microbiota analyses.

We have shown a statistically significant effect of increased feed structure on the reduced spread of *C. jejuni* in chicken flocks, but no significant differences were detected between types of structure included in the feed.

No significant changes in the dominating microbiota in the lower lower gastrointestinal (GI) tract were observed, which indicates that feed structure only has an effect on the upper GI tract. Delaying the spread of *C. jejuni* in broiler flocks could, at time of slaughter, result in fewer *C. jejuni*-positive broilers.

Synthetic and phytogetic antioxidants improve productive performance, antioxidant activity, gene expression, and offspring quality in breeder hens subjected to heat stress

This study (Poult. Sci. Vol. 103, Issue 3, March 2024, 103390 Pasri, Rakngam, Gérard, Mermillod, Khempaka) aimed to investigate the efficacy of a synthetic source (a combination of vitamin E, vitamin C, selenium, and L-carnitine) and

phytogetic sources (a combination of clove, green tea pomace, and Vietnamese coriander) in overcoming heat stress (HS) damage in female breeder hens on production, blood chemistry, sperm survival in the oviduct, antioxidant properties, gene expression, and quality of offspring.

One hundred SUT female breeder hens were housed in individual cages and divided into 4 treatment groups: T1) basal diets in the thermoneutral (TN) zone; T2) basal diets under HS; 3) basal diets with synthetic antioxidants under HS; and T4) basal diets with phytochemical antioxidants under HS.

The result revealed that HS condition had a negative effect on reducing final body weight, egg weight, and 1-day-old chick weight while increasing water intake and FCR and altered blood chemicals in breeder hens compared to TN breeder hens ($P < 0.05$).

However, either synthetic or phytogetic antioxidants resulted in increased egg production and hatchability, while decreasing the number of late stages of embryo death during the incubation ($P < 0.05$).

Furthermore, the synthetic antioxidants also improved the uniformity of chicks and reduced late-stage embryo death compared with phytogetic antioxidants

($P < 0.05$). HS breeder hens fed with either of the antioxidant sources exhibited higher antioxidant capacity in terms of DPPH and ABTS radical scavenging (in yolk, liver, and breast meat) and FRAP radical scavenging (in yolk and liver) and lower liver malondialdehyde than HS breeder hens fed with the control diet ($P < 0.05$).

Additionally, the gene expression of antioxidant enzymes (superoxide dismutase, catalase, and glutathione peroxidase) in the liver was upregulated, whereas the expression of proinflammatory cytokines (nuclear factor- κ B) and heat shock proteins (HSP70 and HSP90) was downregulated in breeder hens that received both antioxidant sources ($P < 0.05$).

Rural Poultry Farming: Leveraging Higher Poultry Input Costs to Grow Zambia's Indigenous Chicken Sector

This study (Poultry 2024, 3, 383–398, Kanyama, Ngosa, Sibanda, Moss, Crowley) aimed to highlight the price changes in poultry inputs and outputs and demonstrate that the IC sector has more potential to contribute to farm income than commercial chickens under family poultry production systems.

We analysed the prices for inputs and outputs for Zambia's poultry industry for the first quarter of 2016 to 2023 using data from the Poultry Association of Zambia (PAZ).

We also analysed data from the 2021 Qualtrics survey to investigate the crops grown and crops used as feed and feed ingredients, the sources of feed, and the use of minerals and vitamins by SSFs for chickens.

The gross profit (GP) and benefit–cost ratio (BCR) were analysed to compare the viability and profitability of ICs and broilers under SSFs.

Results: Our study shows that prices for day-old chicks (DOCs) and point-of-lay (POL) pullets increased by 57–125%, broiler and layer feeds increased by 67–96%, and soybean meal (SBM) and fishmeal rose by 143–229%.

Prices for live ICs, commercial broilers, and ex-layers increased by 150%, 79%, and 71%, respectively.

Egg prices rose by 100–124%. Farmers tried to look for local feed sources. Over 21% of the crops grown were maize, and nearly 43% was used for feed. (e) Our analysis and comparison between the ICs and broilers demonstrated that SSFs could achieve more farm income by producing ICs than commercial broilers.

International News

Innovation in egg transport protection



TPI-Polytechnik, a producer and supplier of

ventilation components for the agricultural sector, recently announced the launch of its latest innovation, the ECC500.

It is developed to help companies transport eggs safely and efficiently without compromising on quality or cost.

Why the ECC500?

In the poultry industry, protecting eggs during transport is essential.

With a focus on protection, durability, and versatility, the ECC500 offers more than standard protection.

Its durable construction ensures a long lifespan, reducing maintenance and replacement costs.

Thanks to its versatility, the ECC500 fits various transport systems and can easily handle bends, inclines, and other transport challenges.

Whether it's protection against

temperature fluctuations, shocks, or other environmental factors, the ECC500 ensures eggs arrive undamaged.

This solution not only guarantees higher yields but also helps maintain consistent quality, a benefit felt throughout the supply chain.

The solution:

Made from high-quality polyurethane, the twelve-sided ECC500 offers superior insulation and protection and can be opened and closed easily. The cover is secured to an adapter base, allowing installers to use their bracket suited to specific situations.

The cover can follow any route, with fully customised bends, inclines, and declines.

The ECC500 is compatible with various egg conveyor systems, providing a standardised, effective long-term solution for poultry farmers.

tpi-polytechnik.com

Fluent in Chickish



Profit comes from speaking "Chickish" says the H&N Layer Academy in Manila, Philippines.

A total of 72 participants and customers from over 8 countries across the world attended an event focused on interactive entertainment to maximise the experience.

Learning must be fun to be effective; at least that's H&N International's take on it.

Their academies are aided by digital learning formats to make them interactive and highly collaborative so customers can

learn to meet and widely exceed standard results. That's why nearly every lecture embedded a digital quiz format that gathered hard data and direct feedback.

Dr. Fernando Carrasquer coined the phrase "speaking Chickish" when showing how lighting programs are the way to inform your birds about your desired egg targets.

He issued a warning to limit oneself to models based on theoretical local feed availability, as practically they won't work when you are not in the very same location or feed availability changes!

hn-int.com



A forum for immunity and gut health



This October, Agriinsight Publications

attended the Immuno'Science Forum, an event organised by Olmix and dedicated to immunity and gut health, to highlight the importance of those functions to secure animal health and performance.

This gathering brought together international keynote speakers, covering various species such as poultry, swine, ruminants, and aquaculture.

The forum was enriched by the presence of representatives from 14 different countries, fostering a global exchange of ideas and knowledge. The attendees could discover the potential of seaweed and yeast technologies to provide solutions to reinforce immune response and gut health.

Dr. Rami Dalloul is the R. Harold Harrison Distinguished Professor of Poultry Science at the University of Georgia, Athens, USA.

His multidisciplinary research focuses on areas investigating host-pathogen interactions during enteric challenges, in particular coccidiosis and clostridial diseases in chicken and turkey. In this context, his group explores the molecular mechanisms of mucosal immunomodulation and physiological immunological responses of the host during such challenges.

In his talk, entitled "Enteric defences in poultry: dynamics and potential modulation," Dr Rami Dalloul gave a comprehensive overview of the birds' immune system and introduced the unique bacterial and parasitic co-infection model developed in his lab to mimic necrotic enteritis (NE) challenge.

He also summarised the results

that several nutritional strategies targeting immunity, gut integrity and microbiota obtained using this model, opening the floor to Olmix speaker Maria Garcia, Immunity Product Manager, to present the results obtained using this co-infection model with Algimun, a seaweed-based solution.

In this trial on broilers, Algimun improved performance by lowering mortality, decreasing the FCR and reducing Necrotic Enteritis intestinal lesion scores. Algimun also reduces the inflammatory response by lowering serum calprotectin concentration and modulating immune response genes in the gut. Besides, gut integrity was enhanced, as shown by an upregulation of the gene expression of tight junction proteins.

These findings prove that Algimun enhances broiler performance and mitigates the negative effects of NE. Maria also presented results in broiler breeders, obtained in the French research centre Zootests, in which Algimun improved the performance of the hens by lowering mortality (-55%), increasing the laying rate (+0.5%), and significantly improving hatchability (from 0.5% to 2%).

Moreover, Algimun improved vaccination response to IBD and ND, providing a more homogenous protection of the flock.

To conclude, Maria presented data obtained with GlucanGold, based on yeast beta-glucans, in a commercial layer farm in Mexico during a respiratory viral outbreak in the first weeks of laying, where GlucanGold proved to reduce the mortality by 37% and supported laying rate recovery.

olmix.com

International News



Aviagen India welcomed key industry leaders to Chiang Mai, Thailand, for its Annual Leadership Summit. The event was an exclusive gathering of prominent Indian poultry producers, designed to encourage collaboration, share insights, and explore emerging trends and opportunities in the sector. Dr Ramakrishna Balasubramanian, Aviagen India Business Manager, opened the summit with a warm welcome, followed by Dr Peter Fisher, President of Aviagen Asia, who provided an update on the poultry market in India and across Asia. The summit featured a series of thought-provoking presentations from industry experts. In his closing remarks, Ferry Monné, Marketing Manager for Aviagen India, expressed gratitude to the attendees, emphasising the value of such collaborative gatherings in driving the industry forward. Reflecting on the event, Dr Balasubramanian told International Poultry Production, "The high level of engagement and quality discussions at the summit highlights our commitment to empowering our customers with the knowledge and tools they need to thrive in a rapidly evolving market. We are dedicated to supporting their growth and ensuring they are well-prepared to meet future challenges and opportunities."

aviagen.com

Lidl GB partners with Kipster



Lidl GB recently announced an exclusive UK partnership that will make it the first retailer in Great Britain to sell British eggs from the revolutionary egg company Kipster, which is said to produce "the most animal and environmentally friendly farms in the world". Kipster's industry-leading and transformative farming concept will see British eggs produced by chickens that are farmed to the highest welfare standards and which have a significantly reduced carbon footprint, with the

remaining offset through the purchase of carbon credits.

Having first introduced its egg farming concept to the Netherlands in 2017, Kipster's exclusive partnership with Lidl GB means British shoppers will be able to purchase eggs sourced from Kipster's British "egg farm of the future" from Spring 2025, once planning permission for the farm in Shropshire has been granted.

This partnership follows the Lidl's industry-leading move to introduce Welfare Windows on packaging to improve supply chain transparency for customers.

corporate.lidl.co.uk

Mobile NIR feed testing partnership



As emerging technologies and advances in animal nutrition bring more precision to livestock production, AgroCares and Trouw Nutrition, Nutreco's livestock feed business, are pleased to announce the renewal of their NutriOpt On-site Adviser agreement.

The collaboration pairs Trouw Nutrition's institutional knowledge and nutrient database with AgroCares' proprietary portable NIR scanner technology. By leveraging each partner's expertise, the collaboration aims to provide real-time, comprehensive nutritional insights that can directly benefit farms' and feed mills' operational efficiencies, economics and sustainability efforts.

Leveraging Trouw Nutrition's extensive nutrient knowledge and database, the NutriOpt On-Site Adviser can assess raw ingredients and finished feed for a specific species in less than five minutes. Species-specific nutrients are available for swine, ruminants, and poultry. New hardware developed

and manufactured by AgroCares empowers farmers and feed producers to apply the nutrient profile of raw materials, silages and complete feed to make species-specific decisions.

"We are excited to continue our partnership with AgroCares, whose technology has been instrumental in delivering the precision and reliability our customers expect.

Our joint efforts have already made significant impacts in the industry to date, and we are committed to driving further innovations that benefit both our customers and the planet," Casper Niesink, Director Global Solutions and Services at Trouw Nutrition told International Pig Topics.

trouwnutrition.com



Revolutionising sustainable production



dsm-firmenich, the leading innovator in health, nutrition, and beauty, has announced a pioneering partnership with Bounty Fresh Group (BFG) Philippines, a leading fully integrated poultry producer and food retailer.

The two organisations have signed a Memorandum of Understanding (MOU) to implement dsm-firmenich's Sustell platform, the leading life cycle assessment (LCA) platform to measure and improve the environmental footprint of animal proteins.

The agreement marks another successful sustainable agreement for dsm-firmenich in the Philippines' farming sector. Bounty Fresh Group (BFG) has a focus on expanding product offerings, sustainability and community

support within the agricultural ecosystem.

Dr David Nickell, Vice President of Sustainability and Business Solutions at dsm-firmenich Animal Nutrition & Health said, "We are proud to partner with Bounty Fresh Group Philippines on implementing our Sustell platform to enhance the sustainability of their poultry operations. Through implementing precise, scalable and credible environmental impact measurements, we can work together to create more sustainable food production systems that benefit both producers and consumers.

The innovative Sustell platform allows BFG to precisely measure and improve the environmental footprint across their entire poultry value chain.

This includes breeder farms, hatcheries, broiler farms, feed mills, nutrition and dressing plant operations.

dsm.com

International Mini Ads





Revolutionary cleaning robot for aviary systems

At EuroTier, Big Dutchman presented Sharky 430, the world's first highly automated cleaning robot for rearing and laying aviaries with flexible programming.

Sharky 430 is an innovative solution for farmers who want to reduce their workload and improve hygiene in the house. The innovation is a joint development by Big Dutchman and Enviroligic AB from Sweden. The trendsetting solution received a silver Innovation Award in the run-up to the show.

The robot is very slim and has a well-designed cleaning arm with a nozzle that easily and reliably reaches any area of an aviary, even those that are difficult to access, such as nests and troughs. One of the robot's most important features is its flexibility.

The cleaning programs can be adapted to the specific aviary type

for optimal cleaning results. For Big Dutchman aviaries, cleaning sequences are pre-programmed. Sharky 430 can completely clean even larger systems that can be up to 3.6 meters wide and up to 4.3 meters high.

The automation of Sharky 430 is particularly innovative. The robot cleans without touching the aviary and does not need guide rails. It can also be used without human supervision. The farmer receives automatic status messages on the smartphone to stay up to date. The supply line, up to 130 meters long and also laid automatically, ensures maximum flexibility of Sharky 430.

Sharky 430 significantly increases the degree of automation in poultry houses, which not only promotes efficiency and occupational safety but also boosts bird health due to improved hygiene.

bigdutchman.com

Performance optimisation

MiXscience revolutionises performance optimisation in poultry farming with ADN, its new digital tool. For several years, miXscience has focused on controlling feed costs, which represent between 70 and 80% of the cost of broiler production.

To meet this challenge, the miXscience teams have developed an innovative digital tool: ADN (Nutritional Decision Support Tool). It predicts the performance of fast-growing chickens based on the feeding program. Based on the

analysis of 46 trials from the miXscience research centre (MRC), ADN offers robust, precise, and reliable prediction models by considering the complex interactions between nutrients.

The tool is updated each year thanks to the addition of new zootechnical trials. By integrating the latest advances in nutrition and providing precise and comparative analyses, ADN positions itself as an essential tool for players in the poultry industry wishing to innovate and progress towards precision nutrition.

mixscience.eu



On September 10, Cargill Philippines hosted its 2024 Poultry Business Conference (PBC) at the Hilton Clark Sun Valley Resort in Clark, Pampanga.

With the theme "Leading Business Through Synergistic Collaboration," the event stressed the vital role of strategic partnerships in addressing the evolving needs of the poultry industry and securing our food future. As the Philippines' population grows, so does the demand for poultry, as chicken and eggs are staples in every household. With per capita consumption expected to rise by 3 to 5% and production growing steadily at 7%, the future of the poultry industry is promising. However, the bright outlook comes with its share of challenges, including disease, climate conditions, market fluctuations, and importation issues, all of which require collective action. Cargill's Poultry Business Conference brought together industry leaders, poultry owners, and stakeholders to discuss emerging trends and strategies that are essential for the sector's future.

cargill.co.uk

Strategic distributor alliance to drive innovation



Amlan International, the animal health business of Oil-Dri Corporation of America and a global leader in mineral-based feed additives that optimise the intestinal health of poultry and livestock, is pleased to announce its partnership with VetPro as a new distributor in Brazil.

VetPro, a rising company located in North-East Brazil, is poised to play a central role in driving the adoption of Amlan's innovative products, particularly Calibrin-Z and Varium, to meet the demands of the Northern Brazilian market.

This key collaboration is set to accelerate Amlan's growth strategy in Latin America. The new relationship marks a significant milestone for Amlan as it seeks to capitalise on Brazil's rapidly expanding animal nutrition sector, which produced 81.1 million metric tons of feed in 2022. By combining Amlan's advanced, natural mineral-based feed additives with VetPro's broad regional expertise and distribution capabilities, the partnership aims to promote innovative feed

additive solutions and position Amlan for substantial market share growth and enhanced regional impact.

As part of its commitment to advancing animal health in Brazil, Amlan is bringing two of its flagship products—Calibrin-Z and Varium—to the North-East region through its new distribution arrangement. Calibrin-Z offers comprehensive protection against a wide range of harmful mycotoxins that threaten livestock and poultry health, while Varium strengthens the intestinal barrier, enhancing gut health and overall productivity.

As part of this partnership, VetPro will leverage its strong distribution network and customer relationships to effectively promote Amlan's products.

With VetPro's extensive knowledge and reach in this critical region, Amlan aims to deliver cutting-edge solutions to local producers, helping improve animal health and performance in one of Brazil's most dynamic livestock markets.

amlan.com

International News

Reovirus vaccines for turkeys



USPoultry and the USPoultry Foundation announce the completion of a funded research project aimed at developing six vaccines for reovirus in turkeys by researchers in the Department of Veterinary Population Medicine at the University of Minnesota.

Made possible by an endowing Foundation gift from West Liberty Foods, the research is part of the association's comprehensive research program encompassing all poultry and egg production and processing phases.

Turkey arthritis reovirus (TARV) causes lameness and hepatitis in turkeys, resulting in huge economic losses and can also lead to welfare concerns. The university aimed to develop live attenuated vaccines that could provide broad protection against TARVs and turkey hepatitis reoviruses.

The six vaccines developed in the study indicated they were safe to use in poults. However, a single dose of the developed vaccines in 10-day-old poults was insufficient to protect against the disease.

uspoultry.org

Salmonella spp. significantly reduced



CID LINES, an Ecolab company, recently presented a Farm to Fork trial conducted by the Poultry Science Department of the University of Georgia, Atlanta (UGA).

The results demonstrated a significant 67% reduction of Salmonella spp. in broiler carcasses at the pre-chilling stage.

For this study, tailored hygiene protocols were implemented for pullets, broiler breeders, and broilers which included the cleaning and disinfection of surfaces and water systems, as well as drinking water disinfection.

The products used in the trial were Kenosan, Virocid and Cid 2,000 which, along with the barn hygiene protocols, contributed to a reduction in Salmonella prevalence throughout all phases, compared to the control group.

For pullets the reduction in prevalence was 40%, while for breeders, the prevalence was significantly lower in slat, shoe cover swabs, drag swabs, litter,



New European logistics platform in France



Ceva Animal Health, a leading French animal health

company, has inaugurated its new European distribution logistics platform in Montpon-Ménestérol, Dordogne, France.

The ambitious project, financed by the French government as part of its recovery plan, represents a major opportunity for Ceva's international growth and further demonstrates its commitment to innovation, regional development, and sustainability.

The 12,000 m² logistics center is designed to store and ship Ceva's products developed in Europe, enhancing the company's export capabilities and boosting its international presence.

With a physical presence in 47 countries, 21 innovation and development centers, and 33 production sites, Ceva aims to make Montpon-Ménestérol its first European logistics site capable of serving more than 100 countries.

The 12,000 m² dedicated to storage cells is equipped with a Warehouse Management System

(WMS) that optimises all logistics flows, from reception to shipment, and includes autonomous tri-directional carts to facilitate storage and order preparation.

These innovations give maximum efficiency, reducing lead times and optimising the supply chain.

The construction of this new logistics center is part of the company's efforts to achieve a controlled and sustainable environmental footprint.

The facility aims to be energy self-sufficient in the long term, thanks to a virtuous energy mix combining geothermal probes with 1,500 m² of photovoltaic panels producing 50% of the energy consumed, optimised lighting management, enhanced building insulation, and water resource management.

The new logistics platform is the group's first building to achieve BREEAM certification, which assesses buildings based on criteria such as energy management, employee quality of life, and efforts in biodiversity.

ceva.com

and drinking water. The prevalence of Salmonella in broiler carcasses at pre-chilling was significantly lower in the treatment group (33,3%) compared to the control group (100%).

cidlines.com

CVMP positive opinion



Vaxxinova recently announced that the Committee for Medicinal Products for Veterinary Use (CVMP) has adopted a positive opinion,

recommending the approval of Vaxxon ND Clone in the EU.

Vaxxon ND Clone is a vaccine for active immunisation of chickens (broilers, future layers and breeders) to reduce mortality and clinical signs of disease caused by infection with Newcastle disease virus. The final approval is expected before year-end 2024.

Vaxxon ND Clone is the first EU licensed poultry vaccine for Vaxxinova in the European market. It marks the introduction of a broader EU licensed poultry vaccine portfolio.

vaxxinova.com

EVENT DIARY

2025

IPPE

28-30th January 2025
Atlanta, Georgia USA
www.ippexpo.org

VIV ASIA

12-14th March
Bangkok, Thailand
www.vivasia.nl

Turkey Science and Production Conference (TSPC)

18-20th March 2025
Cheshire, UK
tspc-turkeys.com

North Central Avian Disease Conference

In conjunction with peak 2025
7-8th April 2025
Minneapolis, USA
midwestpoultry.com

Middle East Poultry Expo

14-16th April 2025
Riyadh, Kingdom of Saudi Arabia
mep-expo.com

VIV Select Turkey 2025

24-26th April 2025
Istanbul, Turkey
vivturkey.com

ESPN 2025

23-26th June 2025
Maastricht, The Netherlands
espn2025.eu



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