

Indonesian symposium looks at the ABC of the biosecurity challenge

Later in 2017 VNU Asia Pacific hosted a one day ABC Challenge symposium that focused on various aspects of biosecurity in poultry production.

Historically, faith was put into antibiotic growth promoters (AGPs) to contain certain diseases, a good example being necrotic enteritis, but AGPs are rapidly going out of vogue and alternative strategies are now required.

Quality control in the feed mill

Jan Cortenbach of De Heus China, considered quality control in the feed mill and how this helps to keep birds healthy. Birds should be fed only that which is formulated for them and various quality management systems can come into play to ensure this happens (see Table 1).

Firstly, all suppliers of ingredients should be visited and checked in terms of quality, working procedures, traceability of raw materials, storage and transportation.

Secondly, all incoming raw materials should be analysed and, if materials are out of specification, they should be rejected and the supplier informed. If appropriate, formulations can be updated to take into account nutritional variance in an ingredient.

Finally, after production, the end product should be checked and feed and raw material samples retained until at least the expiry date of the finished feed in case they are needed for further examination.

- ISO 9000 (9001:2008 etc)
- HACCP Food (Hazard Analysis of Critical Control Points)
- GMP/GMP+ (Good Manufacturing Practice)
- Lab-Code (approved laboratory)
- Secure Feed
- Approved Feed Chain Programs
- Feed-Trac²
- European Feed Team
- EU registration (183/2005)

Table 1. Various feed mill quality systems.

In addition, records must be kept of what went into every batch of production and the customers/farms that the feed ultimately went to. Other factors that influence the production of biosecure feed include segregation (species specific production lines), rodent and wild bird control, bulk delivery of raw materials, control (ownership) of transport, pelleting and heat treatment of the feed.

In the second part of his presentation, Jan went on to consider AGPs. These should be replaced – not just by a single additive but by a new feeding concept. The choices are listed in Table 2.

After briefly considering these options, Jan specifically focused on salmonella control. He highlighted three key areas to

control salmonella in feed – prevent contamination, reduce bacterial multiplication and kill the pathogens.

To be assured of low levels, incoming ingredients should be checked for salmonella but sampling can be difficult because of an uneven distribution in the feed. Ingredients should have a low moisture content and should only be sourced from proven suppliers with a good salmonella track record.

Dust is a major source of salmonella contamination in feed mills and should be featured in any monitoring programme.

Good places to collect dust samples from
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Table 2. AGP alternatives.

- Acidifiers
- Probiotics
- Prebiotics (oligosaccharides)
- Enzymes
- Cell wall fragments
- Phytobiotics (herbs/flavours)
- Minerals
- Non-starch polysaccharides
- Protein and amino acids
- Dietary ingredients and feed presentation
- Management and husbandry techniques



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include the raw materials receiving pit, dust collecting filters (hammer mills), the tops of pellet coolers, the top of the finished feed mills, spilled feed and debris in the processing area.

Air and people flow should not provide opportunities for recontamination of treated feed. It should also be noted that fats and oils protect salmonella and so there should be minimal fat and oil accumulations around the mill.

Condensation in the mill is also bad news.

Jan highlighted the important fact that many micro-organisms show adaptation to acidic environments and, in the case of salmonella, this can contribute to an enhanced virulence via an increased acid tolerance.

The probiotic option

Probiotics are live microbial feed supplements which have a positive influence on the bird by improving its intestinal microbial balance. The bacterial strains commonly used in this way include lactobacilli, Bifidobacteria, enterococci and streptococci.

Prebiotics, on the other hand, are non-digestible food substances that improve health by stimulating the growth and activity of beneficial bacteria in the gut. These nutrients include non-digestible (fructo) oligosaccharides fructans. They also stimulate the growth of beneficial Bifidobacteria Spp. in the large intestine.

Some enzymes, such as proteases, amylases and lipases, can improve nutrient digestion and absorption and reduce the amount of undigested material in the lower gut. This means there is less material to favour the growth and multiplication of undesirable bacteria.

Parts of the cell walls of bacteria and yeast have a stimulating effect on the immune system. Some substances from sea algae have a similar effect.

Non-starch polysaccharides provide additional digestible fibres. These can reduce the transit time of digesta through the gut and increase the proportion of digesta in the hind gut, decreasing scour.

The use of minerals in this context is rarely used in poultry but common in pigs

Condition of egg	Total bacteria	Coliforms	Two week chick mortality
Clean	600	123	0.9
Slightly soiled	20,000	904	2.3
Dirty	80,000	1,307	4.1

Table 3. American data on bacterial quality of hatching eggs (J. Mauldin, 1998).

where copper sulphate and zinc oxide are used in many parts of the world.

Research has shown benefits in lowering the percentage crude protein, while maintaining the amino acid level and balance. There is also evidence to show that arginine and glutamine play a role in the development of gut epithelium and immune stimulation.

In feed formulation it is important to restrict nutrients that might promote the growth of pathogenic bacteria and to restrict or remove anti-nutrition ingredients like tannins, lectins and protease inhibitors.

Functional feed additives

Emma Teirlynck from Trouw Nutrition looked at the role of functional feed additives in antibiotic reduction strategies. She started by reflecting on current antibiotic usage, of which 80% is in animals.

The main reasons for reducing antibiotics include legislation and sector agreements, antibiotic resistance, and the unique 'antibiotic-free' selling point in the meat and egg market sectors.

Trouw Nutrition have an integrated approach via the feed, farm and health of the animal. This approach starts with a customer's need for antimicrobial reduction and then assesses the customer's situation to define specific solutions. Values are confirmed before going on to define their implementation, including recommending changes to current farm management.

The final step is the evaluation of the approach. Antibiotic reduction strategies require an integrated approach for total production chain optimisation. The key aspects targeted in feed management are raw materials management, diet formulation, feed form and safety.

Much of the raw materials stage uses NIR,

which gives fast and inexpensive analysis of nutrient contents and reactive lysine monitoring to assess heat damage of soybean meal.

Key points in formulation are limiting crude protein with optimisation of digestible amino acids, encouraging gut development, especially in terms of motility and acidification, and the use of a pre-starter to get the best possible start.

When it comes to food safety the focus is on mycotoxins, moulds and enterobacteria, the latter being an indicator of faecal contamination and possible salmonella presence.

Farm management is of particular importance and things to look at include biosecurity and hygiene, environment and equipment, water quality and managing the brooding period. Another key area for attention is health management including health and disease status and chick quality.

On the health and disease status front, special emphasis is given to the digestive tract and a gut health scoring system has standardised and improved diagnosis in the field. This system has been shown to have a good correlation with histopathology.

In addition, Trouw Nutrition has a tailor made range of products that operate at different levels of the digestive tract.

In the upper reaches the aim is to support digestion and the natural barrier against Gram negative bacteria. Throughout the small intestine the aim is to improve the microbial balance.

Finally, the aim is to boost gut barrier integrity throughout the whole intestine.

Chick quality starts with good breeder management

When it comes to chick quality, Emma believes this starts with breeder management. She highlighted American data to support this in terms of egg cleanliness and subsequent chick mortality (see Table 3).

Fig. 1 shows the impact of Selko pH in the drinking water of broiler breeders on the number of dirty eggs produced.

She concluded her thought-provoking presentation with results from a company in Israel who had used this programme for some time. Out of the many statistics she cited from Israel, two that stood out were an increase in the proportion of flocks raised with no antibiotics from 89.1-98.8% and a 3% improvement in FCR. ■

Fig. 1. Percentage of dirty eggs from broiler breeders before and after using Selko pH.

