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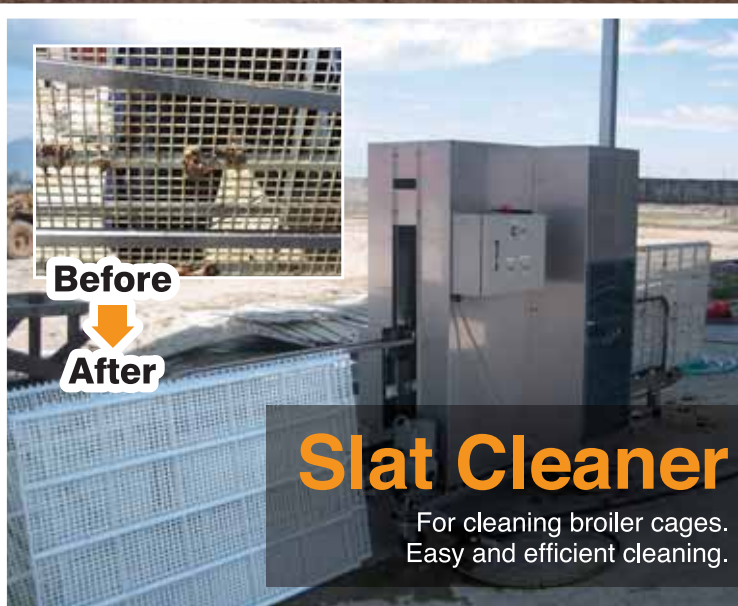



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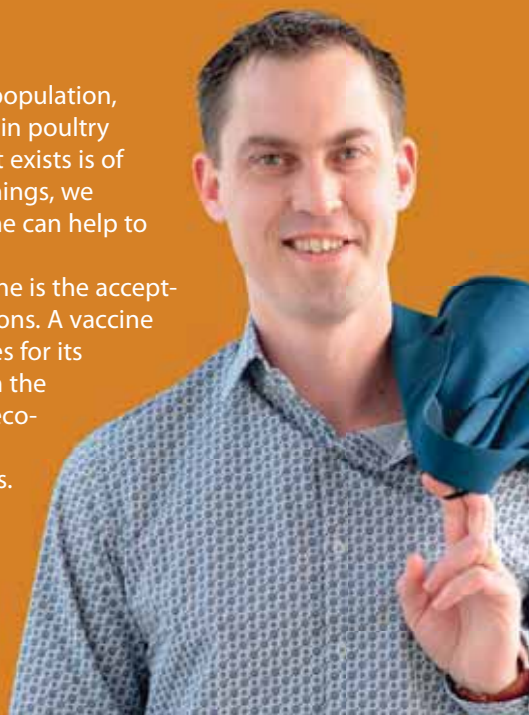
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AI vaccination, a valuable tool

With an avian influenza virus strongly embedded in the world's wild bird population, mutated from known prevalent subtypes into strains that caused havoc in poultry production during the spring bird migration, every countermeasure that exists is of great value to the industry. In this issue of *World Poultry*, among other things, we focus on a proverbial new kid on the block. Vaccination with a so-called vector vaccine can help to mitigate the damage avian influenza inflicts. Even with a vaccine developed, however, there are still many hurdles to overcome. One is the acceptance of use of the new vaccine by legislators. The other is the weighing of pros and cons. A vaccine can protect birds to a great degree, but not 100%. This will have serious consequences for its acceptance in some export markets. There will be no sense in protecting layers, when the export of billions of dollars of dark broiler meat, especially, is at stake. At least when economics are held in higher favour than animal welfare. AI vaccination can be implemented as a valuable tool to prevent and control the virus. But even when the pros outweigh the cons, it will only be one tool in the toolbox. The most important tools will be to further improve biosecurity. Not only in protocols, but also through verifiable actions. And through early warning, followed by preparations to deal with the consequences of an outbreak fast and efficiently.

Fabian Brockötter, editor *World Poultry*



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Keeping the Avian Influenza virus out

During the most recent Avian Influenza summit, a part of the International Egg Commissions leadership conference in Berlin, the egg industry's world leaders discussed all the ins and outs of the current Avian Influenza threat. Keeping the virus out, that should be at the forefront of every producer's mind.

PHOTO: HENK RISWICK



By Fabian Brockötter

Over the last year, the world had to deal with a serious Avian Influenza crisis. A mutated disease led to infections in many countries and it became a fact of life that the virus has settled in the wild bird population, thus posing a higher threat than before. Some were able to stamp out single incidences of the virus quickly and prevent further spread in the poultry population due to early detection from the farmer up, good organisation and experience. However, in the US the virus was able to get out of control. Chad Gregory of United Egg Producers: "We encountered the worst animal disease outbreak in US history, in which we lost the birds of 223 companies." Lack of experience and shortcomings in preparation to battle the outbreak exacerbated the problems. Gregory: "In hindsight, we learnt many lessons, ranging from measures to ensure faster depopulation and better organised disposal of dead birds to vaccination and, of course, improved biosecurity and the issue of sharing crews and equipment between farms."

Verify biosecurity measures

Chairman of United Egg, Jim Dean, lost 5.5 million birds at the farms he is connected to: "We weren't able to stay ahead of the

virus, which meant the virus spread further since we couldn't cull birds fast enough. With the virus source not under control, we saw other farms become infected." Dean stated that even before infection of the first farm many biosecurity measures were in place. "That said, we learnt expensive lessons. The first and foremost is – and here I want to quote our past President, Ronald Reagan – 'Trust, but verify!' For example, for years we had the rule that our workers couldn't enter a facility within 72 hours after being in contact with other poultry. When we resigned the agreement, the crew company said they would have to charge us extra to comply with this rule, saying that they thought the rule wasn't mandatory before."

Disasters happen

"And that is exactly where disasters happen," added professor Rudi Preisinger of Lohmann Tierzucht. "Let's be honest with each other. Do you have a full shower-in, shower-out procedure in place, do you have colour-coded boots and clothes for every zone on your farm? We all know that is not the case in most operations. All producers within the IEC should lead by example. In my world, someone should change shoes from black to green when he steps from the outside the farm onto the farm grounds and change again from green to yellow when he steps inside the house. And when I see someone go outside

Lebensmittel beginnen hier!



for a quick cigarette with his yellow boots on? Then simply changing shoes won't cut it, he'll have to change companies."

The ideal farm

Biosecurity is more than just a shower and shoe operation, it is all about protocols and being prepared for the worst. Andrew Joret of the British Egg Producing Council: "Biosecurity not only keeps out Avian Influenza, all kinds of pathogens, viruses and bacteria can be kept at bay with strict hygiene."

Unfortunately most farms have to deal with an existing situation. "That doesn't mean, however, that the existing protocols cannot be changed. As a thought exercise, I often challenge farmers to imagine the perfect model farm with perfect human and animal movements."

According to Joret, one can learn a lot this way, which can lead to changes in an existing situation. "A model farm wouldn't be built near open water or other poultry concentrations, it would have a perimeter fence with only one entry point with a barrier, parking outside and disinfecting facilities. The farm would have a single age system and the building would be tight and chickens would be indoors." In Joret's opinion, there is a lot to learn from this thought exercise that can be implemented on existing farms without enormous investments or big changes. "Restricting the number of visitors will cost you nothing and

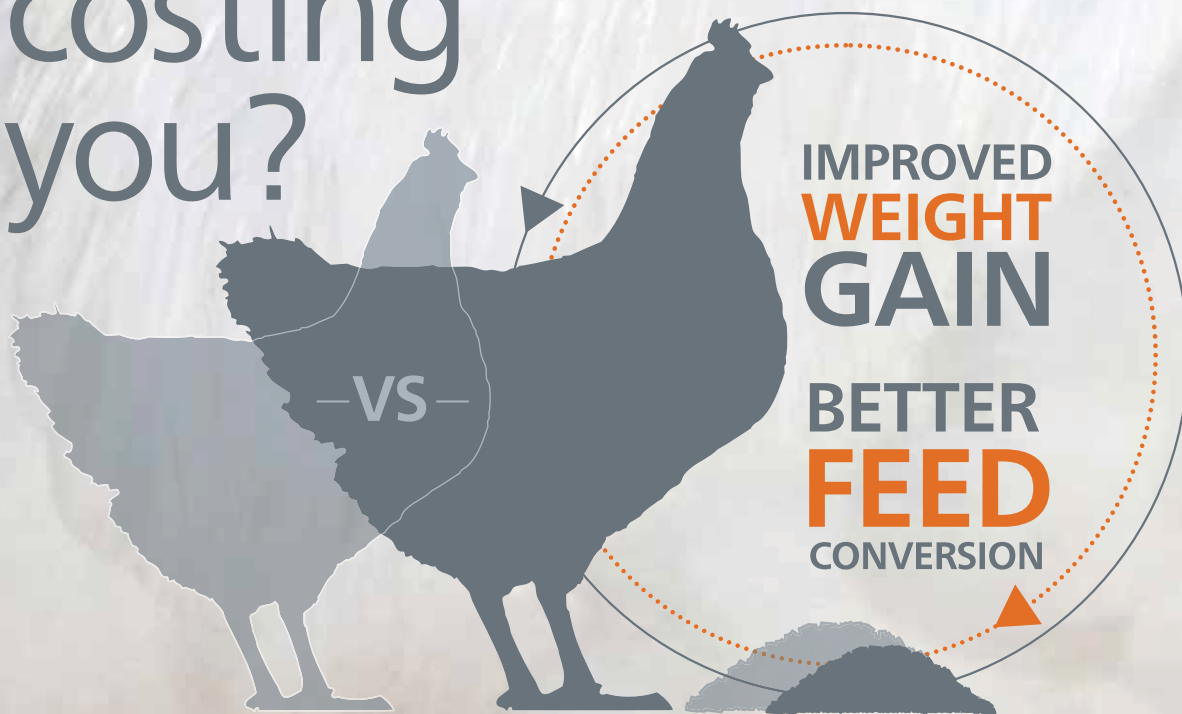
having your employees park outside the farm to prevent 'dirty' vehicles from entering the farm grounds will be cheap. Disinfecting the few vehicles that are allowed on farms will not be expensive. And why should you allow the feed truck to enter, supplying the house from outside the fence is a possibility too. And what about service personnel? Do you allow them to bring their own tools and toolbox, which could have been at another farm as well? Or do you invest in farm-owned tools?"

Flanking measures

Only when the farms' biosecurity is up to speed, backed up with rapid diagnosis to detect possible outbreaks and a well-organised culling and disposal system is there room for taking measures such as vaccination. Professor Hafez of the University of Berlin: "Vaccination can be used as a flanking measure in cases of extreme threat or an uncontrollable outbreak. But it is no substitute for preparation. When a vaccination strategy is in place, it can give producers a false sense of security, leading to less tight biosecurity protocols. That is deadly because no single vaccination will give 100% protection in field conditions or stop a virus spreading." With the virus present in the direct environment of the world's poultry population, preventing the virus from entering the house requires maximum attention, using trusted and verified best practices.

A sign on the wall helps, but it is the actual biosecurity procedures that have to be strictly followed to keep viruses and bacteria out.

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Dutch quality ducks

The Dutch duck farmer Erik Staal spends a lot of time making sure his animals are of high quality and uniform. This is why he receives the maximum quality premium of 3 cents per kilogram from the Cooperation VSE.

By Bouke Poelsma

Peking duck is relatively unknown in the Netherlands. The average Dutch person will eat around 200 grams of duck meat per year. The animal is sold as a whole duck or divided into, for instance, (smoked) chest fillets, ham or thighs. The duck season starts about halfway through September and lasts until Easter. During the summer months, very little duck is consumed. In Germany and France, among other countries, the market for duck meat is much larger. At least 90% of slaughtered Dutch ducks are exported and are known as absolute quality products.

Duck farming is a small sector in the Netherlands. VSE and Tomassen Duck-To are two integrations, which on a yearly basis produce around 9 million ducks. Tomassen Duck-To has the largest factory, with a maximum capacity of 22,000 animals per day of slaughter. VSE slaughters between 70,000 and 80,000 ducks per week and wants to increase the inflow of

ducks meant for slaughter. Especially now that the cooperation is halting slaughter for a Danish integration, VSE is looking for entrepreneurs with barn space for ducks. "Despite the fact that the market price is not fantastic at the moment, we see good opportunities in duck farming. By striving for quality, cost-efficiency and product development, we expect to be able to pay our duck farmers a handsome amount." The duck farmers who provide ducks to VSE are independent entrepreneurs who work based on contracts. "We sell chicks that are a day old and buy back grown ducks," says Nijboer.

Strong animals

VSE works with forty duck farmers, including Erik and Roelie

Duck farmer Erik Staal pays great attention to uniformity and quality, earning an extra premium from integration manager Nijboer (in blue).

After 3 weeks, the ducks are driven to the fattening barn, Peking ducks like the walk.





Staal uses a kilogram of straw per duck every round. The straw is laid down semi-automatically, using hoses.

Staal in Ermelo. If Nijboer has his way, these men will soon have several colleagues. “We have enough space for five to ten extra suppliers, depending on the available barn space,” the VSE-integration manager says, as he points out the advantages of keeping ducks. Ducks are easy and strong animals. Broiler houses often need no adaptation to hold ducks. Antibiotics are next to unnecessary in the duck sector.

Quality premium

While VSE sees chances to increase their turnover and is looking for extra houses, Staal is hoping for better pricing. Including premiums, he now receives €1.07 for a kilogram of duck meat. For a long time, the price was €1.12. “By performing well technically and keeping a sharp eye on my costs, I can make some money. The price is still not near my expectations however,” says Staal.

Since the beginning of this year VSE has been working with a premium quality varying between 0 and 3 cents per kilogram of meat. Independent quality control staff in the slaughterhouse judge the ducks on cleanliness, their feathers, damage, the quality of the sole of the foot, general health and uniformity. “Since we started working with premiums, we have seen a rise in the quality of slaughter,” says Nijboer. According to the integration manager, this is becoming more and more important. According to him, ducks from competing countries like Poland and Hungary are not up to Dutch standards of quality. “Customers choose quality and are prepared to pay for it. This

is where we can beat the competition,” Nijboer says, and points out that VSE wants to reach out to new duck farmers by offering a guaranteed price.

Staal is given the highest premium. He focuses on quality and is not afraid to perform a strict selection at the beginning of the round. This way, he removes potential sources of disease and works towards a uniform stock. At the end of the round, this pays for itself. “Selection is necessary. If you do not perform a proper selection, you are being economical in the wrong sense of the word.”

The premium quality is a hot item among duck farmers. It is an incentive to perform better, according to Staal. “If you touch a farmer’s wallet, he will wake up,” says the entrepreneur whose business, according to Nijboer, is in prime condition. “Erik provides quality.” The duck farmer takes the compliment in a sober manner. “I just want to provide quality ducks. If you’re good to the animal, the animal will be good to you.”

Straw management

Staal works with ducks of two different ages. This way he uses the room in his houses in an optimal manner. Every four weeks, 12,500 one-day-old chicks are delivered. The chicks are put into a raising barn, where they are divided into three groups. After three weeks, Staal drives the animals to the fattening stables. There are no problems there. Ducks have a great capacity for walking. Before changes in the environmental legislation, Staal kept his ducks outside part of the time, but that isn’t allowed anymore under the new government rules. In the fattening barns, Staal keeps seven animals per square metre.

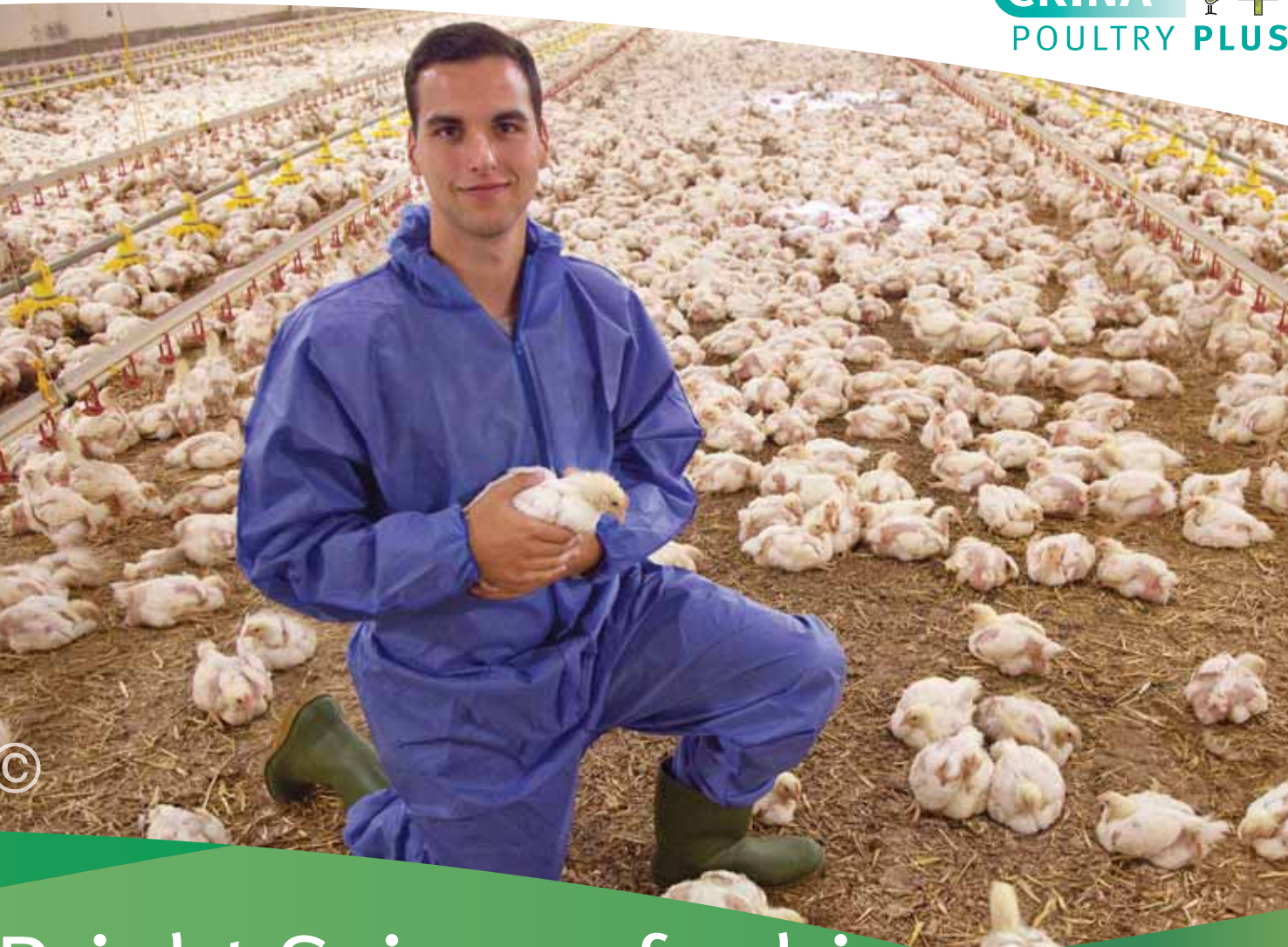
A round takes between six and seven weeks, depending on the season. During the winter, the animals grow a little faster. The target weight for a Peking duck is 3.1 kilograms.

The animals need a new layer of straw every day. Staal uses a kilogram of straw per duck every round. Laying down the straw is done semi-automatically, using hoses. “Straw is a cost some duck farmers used to save money on. This was evident in the slaughter. Since the premium quality, visibly more straw is being used and ducks are much cleaner on delivery. The average premium paid is 2.5 cents per kilogram,” says Nijboer.

At least 90% of slaughtered Dutch ducks are exported and are known as absolute quality products.



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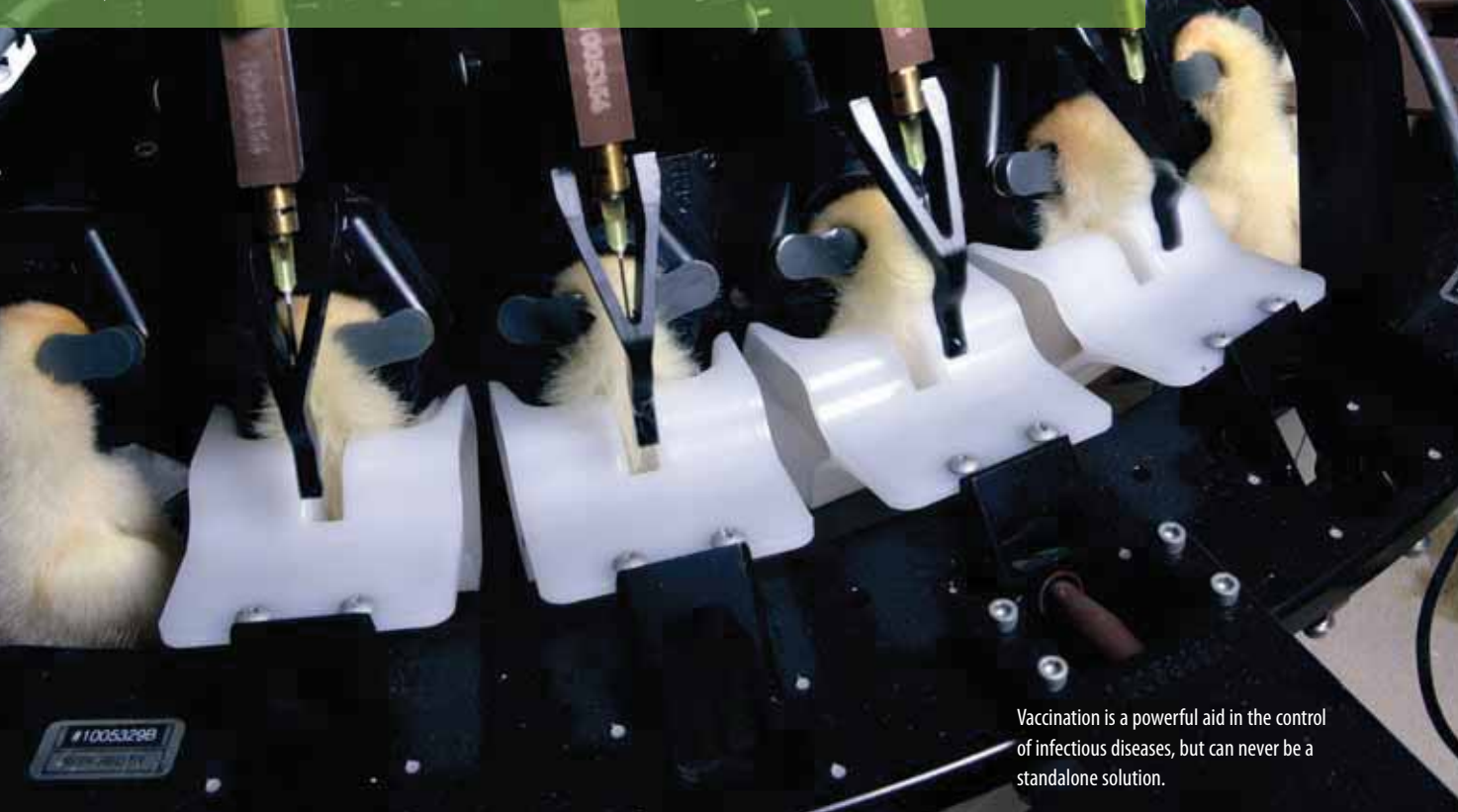
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Vaccination against avian influenza



Vaccination is a powerful aid in the control of infectious diseases, but can never be a standalone solution.

The avian influenza threat has changed recently, disrupting trade, inducing high levels of mortality and causing enormous economic losses. This has changed the discussion on whether to vaccinate or not. Dr Yannick Gardin of Ceva: "There are many dogmas surrounding the control of Avian flu. Countries who decided to vaccinate were viewed as the bad countries, this label is no longer appropriate."

By Fabian Brockötter

Until now, 2015 has seen 309 individual outbreaks of Avian Influenza reported to the World Organisation for Animal Health. This is a staggering 147% increase on the outbreaks reported in 2014. In the US alone, during the last six months, 48 million domestic poultry birds have been culled in 15 states. It has been the worst epidemic of HPAI ever in the US and, despite the outbreak seemingly being under

control, there are fears that AI could reappear at any time. Considering the suddenness and the gravity of this epizootic, many questions have been raised regarding actions to be implemented to control the disease, including interest in using vaccination as a tool to complement measures put in place. It is still believed, however, that biosecurity and sanitary police are sufficient to control the situation and that vaccination is not necessary. It has even been said that vaccination would make things worse by helping the disease become endemic, as happened in some countries in Asia and the Middle East, with a

special focus on China, Indonesia, Vietnam and Egypt. To some extent, the view that vaccination against AI should be banned has actually become a dogma.

New situation

But the situation has changed. The biology of the AI viruses affecting the US is different. The structure of the poultry industry is different. The available technical and financial means are different and we have learned lessons from the past. This all means that today we know better why AI vaccination in Asia and the Middle East was ineffective or poorly effective in eradicating the disease. And, last but not least, a vector vaccine which has recently been developed in the US and introduced on the market has shown properties and potential that make it very different from the old vaccines that are still in use in many vaccinating countries, especially with respect to efficacy and the possibility of monitoring the disease situation in the presence of vaccination. Times have changed. The decision to vaccinate is a tough one. Important information and facts have to be considered before casually discarding the vaccination option or blindly applying it.

Pro's and cons of vaccine categories

As of today, only 2 categories of AI vaccines are commercially available for poultry, the 'classical' killed (inactivated) adjuvanted AI vaccines and the recombinant vector AI vaccines. All of these vaccines, killed or live recombinant vectors show significant differences when it comes to production, route of administration, safety, quality of induced immunity, as well as capacity to overcome the Maternally Derived Antibodies (MDA) against AIV present in the day-old chicks or day-old poulters when the breeders have been vaccinated. For recombinant vectors, interference from MDA directed against the vector also needs to be considered. Another important point, and probably the most critical one to consider in case of vaccine prevention against AI, is the capacity of the vaccine to cover the continuous antigenic variations of the virus. A summary of the advantages, drawbacks and limitations of the various types of AI vaccines is presented in *Table 1*.

In a country or a territory hit by AI, vaccination is primarily a

tool to prevent clinical and economic losses due to infection with AIV. It also serves to complement sanitary and biosecurity practices to achieve eradication and recover the AI free status. If it is the sole means used to combat the disease, vaccination cannot lead to eradication. This is why vaccination against AI needs to be organised, co-ordinated and accompanied with disease monitoring and eradication plans. In a country free of AI, vaccination can also be used to lower the risk of being hit and slow the spread of the virus once a farm is affected.

Recombinant vector vaccines

The recombinant vector AI vaccines are the new kid on the block, changing perspectives on using vaccination in AI prevention and control. These vaccines are made from a live attenuated virus or bacteria (the 'vector'), inside the genome of which a gene (the 'insert'), encoding for the major immunogenic part of AIV (the HA), has been inserted. When it replicates in the birds, the vector expresses the HA, which creates immunity (protection). The HA gene is the only insert that has been used so far, and the different types of recombinant Avian Influenza vector vaccines are abbreviated as rFP-HA, rNDV-HA and rHVT-HA. A number can be used to indicate the subtype of the donor AIV. rHVT-HA5 indicates that the insert comes from an AIV of the H5 subtype.

It is evident that, as of today, the most attractive vaccine solution is the rHVT-HA5. Compared with killed vaccines, it can be used in the hatchery on one-day-old chicks, even in the presence of specific MDA, and shows a long duration of immunity. Its efficacy seems not to be affected by the antigenic variations of the field virus, which is the major weakness of the killed vaccines. rHVT-HA5 has a proven record of efficacy against significant variations of HPAIVs of the H5 serotype and does not require booster vaccinations. Compared with other vectors, it circumvents MDA (when the rFP-HA is neutralised by MDA against AIV and the rNDV-HA by MDA against the vector NDV).

Risks of AI vaccination

Even when an efficacious vaccine is used, the risks identified with AI vaccination are still the same as the ones already

Table 1: Advantages, drawbacks and limitations of the commercially available AI vaccines

Type of vaccine	Cost of production	Safety	Spectrum of protection (H5)	Interference with MDA	Possible routes of old administration at day	Possible use at later age (emergency)	Need for booster in long-lived birds	Possible use in Turkey
Killed								
RG	High	Possible reaction at injection site	Narrow	Yes	Only SQ, difficult because volume of injection	Possible SQ or IM	Yes	Possible
Vector								
rFPV	Moderate	No problem (if not too early in-ovo injection)	Unknown	Yes (interference with insert)	SQ (or in ovo*)	Possible SQ or WW*	Yes	Unknown
rNDV	Moderate	Post-vaccination reactions (respiratory)	Unknown	Yes (interference with vector)	Spray	Possible spray	Yes	Unknown
rHVT	Moderate	No problem	Broad 'cross clade protection'	No	SQ (or in ovo*)	Unknown No (long-lasting immunity)		Possible*

*if accepted by registration authorities



identified for other vaccinations against the Newcastle disease, Infectious bronchitis, Marek's disease or any other diseases.

Vaccination is a powerful aid in controlling infectious diseases but can never be a stand-alone solution. Most of the time, vaccines protect against the disease, i.e. the consequences of infection, not against the infection itself, which means that the field virus can still infect, replicate and be re-excreted. There are only very few veterinary vaccines that have the capacity to totally block the pathogenic agent, which is scientifically called 'sterile immunity'. Even if limited or reduced, shedding the challenging infectious agent is always possible. Thanks to vaccination, the risk is lower but not totally eliminated.

Biosecurity programmes always need to be present and strong, bearing in mind that the best protection against any kind of challenge is simply to avoid it in the first place.

Poor quality of vaccine application

At the level of a flock, there are always birds that are missed during the vaccination process. This is generally acceptable in the case of an epizootic disease like Avian Influenza (or Newcastle Disease) if the percentage of missed birds remains low (less than 3-4%) and if the challenge pressure is not constantly applied to every chicken (as it is in the case of the

Infectious Bursal Disease or Marek's disease).

Vaccination at the hatchery is much easier to control and, consequently, far more reliable than any other type of vaccination, particularly vaccination at the farm, which is why it is preferred (18). But this does not mean that big mistakes cannot be made. There are flocks in which as many as 50% of improperly vaccinated chickens can be detected, so monitoring and assessing the vaccination is necessary.

When it comes to using a vaccine like Vectormune AI, it is particularly important to bear in mind that this vaccine does not spread, so if not vaccinated, a chicken will never be protected by the vaccine given to its hatch mates. So all the critical steps of the vaccination process, including storage, distribution, reconstitution and injection, need to be regularly monitored. One of the important advantages of vaccination in the hatchery is it eliminates the well-identified risk of vaccination crews transmitting AI as they go from farm to farm.

The factors of a good immune response

Vaccination stimulates the immune system to produce an immune (protective) response. If the immune system is compromised at the time of vaccination or later, then protection is also compromised. This is why vaccination works so well at

One of the important advantages of vaccination in the hatchery, is to eliminate the well-identified risk of vaccination crews transmitting AI as they go from farm to farm.

some farms and not so well at others. The quality of day-old chickens or day-old poults, housing, feed, the environment, farming, ventilation, as well as control of intercurrent infections, are also critical factors for the success of vaccination.

Vaccination old style

The fact that Avian Influenza is still endemic in countries where AI vaccination has been used is often presented as an argument against vaccination. In fact, this situation is the result of many factors, including the following main ones: In all countries, the AI vaccines used were mostly, if not exclusively, the classical inactivated types. For this reason, they were unable to ensure good vaccine coverage for the flocks by injecting vaccines at the hatchery. And, if hatchery vaccination was in place, interference by MDA neutralised their action. They couldn't answer the key problem of the field virus evolving or maintain a steady level of efficacy, whatever the challenging virus. Vaccination was implemented more or less as a stand-alone solution, without comprehensive monitoring of the infection. Also, dedicated technical and financial means were generally poor, so that no real co-ordinated action plan and, in particular, no compensation system for farmers affected by the disease were introduced, which meant that the farmers often tried to save the surviving birds by bringing them to the market and, by doing so, helped the disease to spread.

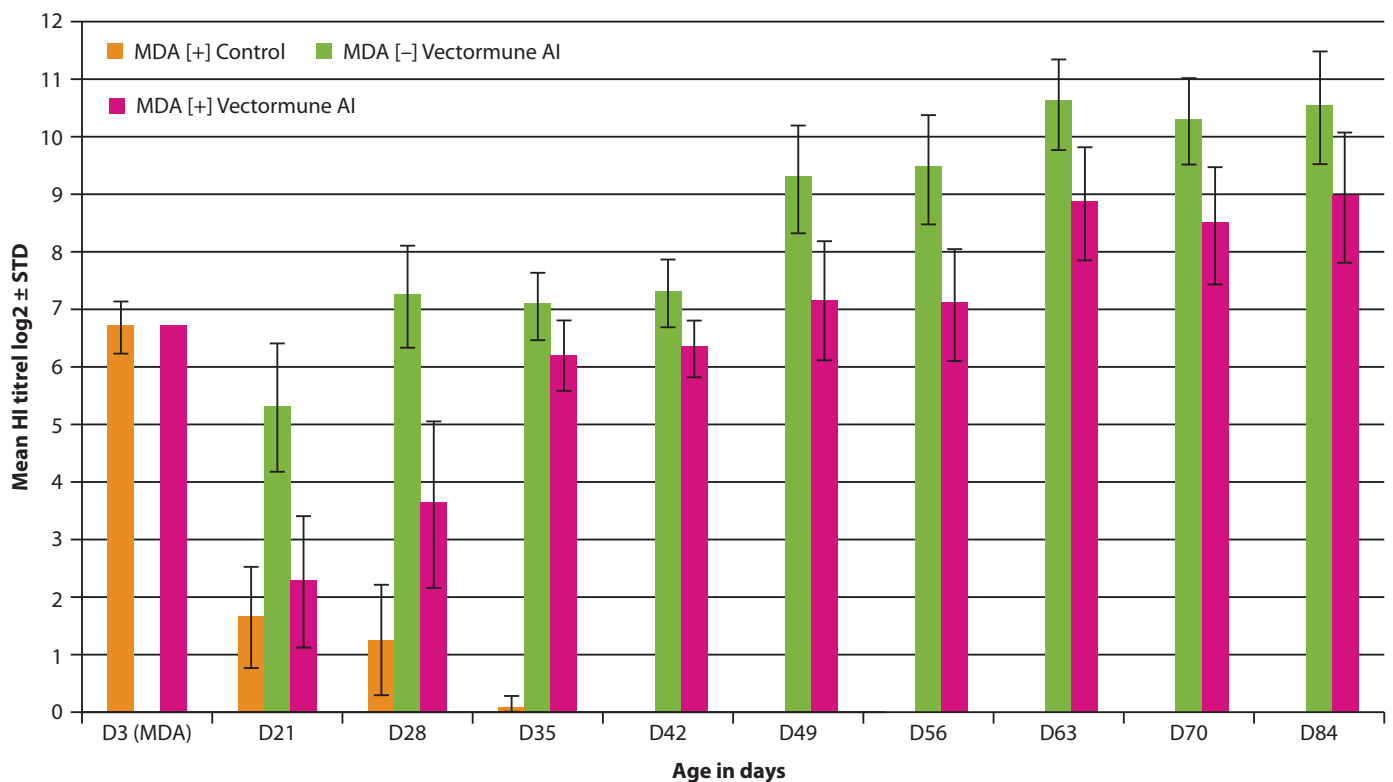
The future of AI vaccination

Avian Influenza has dramatically changed in a few years. It is

now induced by more types of virus and is present in more countries. These more recent viruses are also better "adapted" to wild waterfowl populations. They do not behave like HPAIV in wild waterfowl, which means they can be carried over much longer distances. This unfortunately is helping the spread of the disease. It has also changed our view of it and how to control it. The risk is now much higher and it is the right time to forget about the old dogmas and adapt to this new situation. Fortunately, a new vaccine has been developed that can answer most of the objections we had against vaccination. Many experiments have been conducted with it and it has demonstrated a strong capacity to protect against a wide variety of different H5 type HPAIV and to overcome the presence of MDA and be used reliably at the hatchery. These features did not exist for the classical vaccines used up to now. It is believed that, due to this new rHVT-HA5 vaccine, vaccination can no longer be neglected, but needs to be considered as a real tool to protect the poultry industry against clinical and economic losses without impairing the implementation of a truly efficacious disease monitoring system aimed at eradication. Recent experiments have demonstrated the efficacy of this vaccine against circulating HPAIVs of the H5 serotype. It is also believed that more funds should be dedicated to AI vaccine research. We cannot only continue attempts to understand the rain and the ways to control it. It is now time to work more intensively on umbrellas.

References available upon request.

Figure 1- Monitoring of antibody response to vaccination with a rHVT-HA5 vaccine in commercial broilers provided with MDA against HVT and AIV or not.



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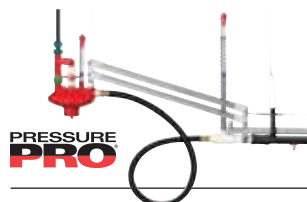
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⚠ WARNING

BEWARE OF LOOK-ALIKES

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Better results by sharing knowledge

A new, revolutionary way of working in the broiler industry: purchasing incubated eggs, the chicks hatch in the house and have direct access to water and food. Vencomatic has ten broiler farmers in the Netherlands and Belgium who work with the X-Treck system.

By Monique van Loon – van Duijnhoven

The past two years, there have been many experiences concerning the hatching of chicks on-site. In the current system, the first chicks at the broiler farm are 48 hours old before they have had the chance to imbibe any food or water. This method puts the strongest chicks, those who hatch first, behind schedule. The first four days chicks are not capable of regulating their own body temperature. Proper growth and development are dependent on the climate that poultry farmers regulate. The perfect combination of air and soil temperature, airspeed and humidity should lead to better quality and less failure among chicks. Fons Romme: “The X-Treck is a unique concept that enables on-farm hatching in traditional houses. Setter trays with 18-day pre-incubated eggs are placed on a rail system suspended over the length of the house. The rail system is suspended in such a way that, during hatching, there is an optimal movement of air around the eggs. The broiler farmer can adjust the height of the system using a winch so they have complete control over the movement of air and temperature around the embryo.”

Sharing experiences

At the proverbial kitchen table, we share our experiences with several experts: Cees Horrevorts, from Van Hulst hatcheries, veterinarian Gerwin Bouwhuis (health care centre for poultry in Emmen), Harm Prins and Klaas-Jan Krijgsheld, who specialise in broilers at De Hoop, and Fons Romme, sales advisor at Vencomatic. All agree that hatching chicks in the house is a new revolution and a system for the future. Cees Horrevorts:

“Belgabroed has 600,000 chicks in Belgium and has a house with X-Treck. We breed small hatching eggs for our own companies. Those results are harder to compare. We see that the chicks are calmer and the look of it is friendlier. It is certain that hatching in the house gives new dimensions to keeping chicks.” Fons: “The X-Treck system is suitable for every house, regardless of the type of heating system. It is important to bring the eggs to the correct height. In practice, we see that companies will simply start a house and see what happens from there.” In a traditional set-up, chicks are immediately pre-occupied with their search for food and water. This is what is so striking about the X-Treck system; the chicks are calm, do not run around as much and make less noise. Once in the house, all the chicks start searching for food and water at the same time. Harm Prins: “In practice, we see that chicks who hatch in the house are more vigorous and easier to manage, which in turn yields a better conversion of food.” Klaas-Jan adds: “The chicks are less stressed out because they haven’t been on a transport and there is less cross-contamination.” Fons Romme: “In practice, a system that can hold 35,000 chicks can be cleaned in an hour during vacancy. After the chicks are hatched, the system is cleaned using a leaf blower.”

Suitable for whom

The hatching of chicks on the broiler farm requires a great deal of involvement from the broiler farmer, according to all experienced experts. He or she should understand the importance of a good start and give this start enough time and attention. Klaas-Jan: “It’s not like we can just hang an X-Treck in the house and solve all our problems in an instant.” Fons: “Everything has to be optimised; then you can earn back the cost of the system within three to four years. X-Treck is used to make a good start, everything else is as usual. You have to gain your advantage from the better start.” Cees Horrevorts: “This system is not compatible with broiler farmers who are already very busy. The first three rounds are used to get accustomed before everything becomes automated. You have to see the challenge. It’s great to experience. You hear chirping, but don’t see a single chick. Exciting!” Fons Romme: “The companies are given intensive support. Every company and poultry farmer needs a different approach.” Klaas-Jan: “Often it’s small things; the place where temperature is measured on the egg, for example. On the air chamber this temperature is 2°C lower.” If the egg has the right temperature, everything will be alright. The broiler farmers receive a small suitcase from Vencomatic which



In the past two years, there have been many experiences with the hatching of chicks on-site. User days for sharing knowledge help farmers to further optimise the system.

includes an ear thermometer, anemometer and a manual with clear instructions, which will clarify various situations. Gerwin Bouwhuis adds: "Hatching in the house isn't difficult. It just requires slightly different areas of concern."

Animal health

If you are able to offer food and water to the chicks immediately, their organs will develop incredibly fast for the first two days. The chicks will have a good start, better technical results and a low use of antibiotics. The sooner the intestines come into contact with food, the better. A chick can survive just fine for several days using the yolk sac alone. The energy is then used to survive. Gerwin Bouwhuis: "If the chicks who hatched first go too long without food, this will influence their immune system in a negative way. The intestinal villi will break and bacteria from the intestines will enter the blood stream, which will result in infections. A disrupted immune system gives negative reactions to the hormonal system. For the health of the animal, hatching in the house is nothing but positive."

Harm Prins: "The experience is that chicks will immediately start searching for water first and food second. The feed stays in the house, so it is hard to measure whether the chicks consume more food. This can be measured at HatchCare, where the chicks stay in the hatchery for the first few days."

Better results

The first user day for broiler farmers using the X-Treck system took place recently. "Sharing experiences and learning from each other was the central focus. All broiler farmers using X-Treck also have a reference house, so we could compare a lot of data," Fons Romme tells us. The broiler farmers indicate that the job satisfaction they experience is much higher when using X-Treck. The technical results are: 50 to 100 grams higher end

weight, 0.5% less deaths, 4-5 points better food conversion, less use of medicine and less trouble with enterococci and coccidiosis. Gerwin Bouwhuis expects that a large number of broiler farmers will switch to hatching broilers in houses. "Broiler farmers are becoming more skilled and want greater control in the production process. I see advantages in hatching in the house. The things the chick experiences in the first few days, during the imprinting phase, it will carry with it for the rest of its life. However, we still need scientific proof of this."

Vencomatic, Belgabroed / Van Hulst and the University of Wageningen are conducting joint research into what the possible explanations could be for the positive results, so broiler systems can become even more sustainable. The goal of this research is to gain greater insight into (possible) differences in animal health and welfare, and the technical performance between chicks that hatch at the broiler farm (X-Treck) and chicks that hatch at a hatchery. What factors in the early life of the broiler result in optimal animal health and animal welfare during the entire production period?

The answer to this question can lead to a large reduction in the intake of antibiotics and an improvement in product quality. "We see several advantages, but they have not yet been scientifically proven. Via this project, we hope to obtain this proof." X-Treck gives an optimal start, resulting in robust broilers. Horrevorts: "A higher rate or return in the broiler business, less use of antibiotics and a better image. As a hatchery, we want to participate and cooperate in this. New developments should be embraced."

Klaas-Jan: "Dutch society is asking for affordable and socially responsible production. The system innovations are aimed at the future and increase our social base of support. They contribute to achieving a better balance between man, animal and the environment."

Tracing a new path in avian coccidiosis immunology

During the recent World Veterinary Poultry Associations congress in Cape Town Hipra launched a new concept in the prevention of coccidiosis for poultry with a long life-cycle. The global introduction of EVALON® + HIPRAMUNE® T ensures maximum control from the time of administration of the vaccine to the arrival of the breeders and/or layers on the farm.

Since the launch of HIPRACOX®, a coccidiosis vaccine for broilers, in 2009, HIPRA has been carrying out important work in the field of coccidiosis control. Now it has taken a very important step with the development of a concept of prevention targeted at birds with a long life cycle where knowledge of the mechanisms of immunity to the disease plays a vital role.

Dr Marc Pagès, project manager for the registration of EVALON® in the EU, gave an interesting account of the different coccidiosis vaccines that there have been in the course of history. He emphasized the necessity for a product that meets the needs of the current situation in the poultry industry, the reason for the composition and, above all, the importance of an adjuvant that is able to boost the cellular immune response.

From this arose HIPRA's idea of developing HIPRAMUNE® T, a component that contains a colorant – to stimulate preening following "coarse spray" application, a flavouring that promotes this preening behaviour – especially in poor light – and an adjuvant – for the first time in a live vaccine – that boosts the cellular immune response by activating the production of Interferon- γ and IL-2. These ingredients encourage preening and ensure lasting protection (up to 60 weeks).

Dr Gregori Bech highlighted the performance of EVALON® in tests carried out with both layers and broiler breeders. In one of the tests, there was an outbreak of coccidia caused by *Eimeria necatrix* in the control shed without any coccidiosis problem affecting the shed vaccinated with EVALON® + HIPRAMUNE® T. Coccidiosis caused by *E. necatrix* has occurred frequently in recent years.

The WVPA congress served as a launch platform for the new vaccination concept: EVALON® + HIPRAMUNE® T, a vaccine with an appropriate composition for the prevention of coccidiosis in birds with a long life cycle and with a specific adjuvant to



PHOTO: HIPRA

Hipra launches a new concept in the fight against Coccidiosis during the WVPA congress in South Africa.

stimulate cellular immunity. HIPRASpray®, a special vaccination device for the hatchery with specific precision mechanisms that improve "coarse spray" application and HIPRALink®, a system that traces the entire process from the preparation of the vaccine in the hatchery to the arrival of the chicks on the rearing farm. The concept of traceability provided by HIPRALink® gives added value to the process, providing transparency. In this way, the work of the hatchery is perfectly documented and the field technician receives information on the process 'on time', all this with the HIPRA guarantee.

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High speed duck processing at Donstar

PHOTO: MAREL STORK

The Russian duck integration Donstar is reviving a great forgotten Russian tradition. It is bringing affordable duck meat back to the table of ordinary Russians. It's growing popularity demands scaling up production and processing.

By Fabian Brockötter and Marel Stork

Donstar is the name of the first large-scale duck meat manufacturer in Russia, situated in the Rostov region near Millerovo. The vertically integrated company produces a wide variety of duck products, known under the brand name "Utolina". To process the ducks, the company teamed up with Marel Stork Poultry Processing. A high capacity duck processing plant was built using the latest available technologies and highest level of automation. Because of the huge success, further extension plans are being developed. Vadim

Shalvovich Vaneev, CEO of the Eurodon Holding, the parent company of Donstar, says: "Our brand represents high-quality, fresh, tasty, tender and succulent duck meat. We are reviving this great, forgotten Russian tradition, a classic. It is a 100% Russian product, made in our Russia for Russians. Duck is becoming an affordable luxury product and is growing in popularity, just like turkey meat. Consumers can choose from a wide variety of attractive Utolina products, such as whole ducks, half ducks, legs, quarters, fillet, wings, giblets, etc. They are superior to what the market had been supplying until now."

Controllable production for high quality

The whole Donstar project involves the construction of a feed mill, a hatchery, over 60 growing sheds, a processing plant and a waste treatment facility. Control over the whole production chain ensures quality control at all stages of the process and guarantees consumers reliable top quality, a safe product grown and processed in an optimum environment. The ducks are processed at a high capacity plant with a current capacity of 4,000 ducks per hour (66 pm). The initial yearly capacity of this project is 26,000 tonnes of duck meat. Expansion plans are being developed to expand up to 40,000 tonnes and more.

The modern state-of-the-art plant employs 900 workers and

The ducks are processed at a high capacity plant with a current capacity of 4,000 ducks per hour.

is unique for Russia. A duck processing plant of a similar high capacity with such a level of automation is a rarity anywhere in the world.

GP dedicated for ducks

The Donstar project includes a Stork GP Live Bird Handling system. This smooth way of supplying live ducks makes a significant contribution to the overall efficiency of the processing plant and safeguards the quality of the ducks. After stunning and killing, the ducks are scalded. The dedicated duck scalders are equipped with the extra agitation necessary to ensure that the ducks are kept immersed and the temperature of the scalding water remains constant throughout the unit.

Custom-made defeathering

After scalding, the ducks are defeathered. This is crucially important for product presentation. The plucking action will also determine the extent to which the epidermis remains attached. This is especially important if whole ducks or portions are to be sold fresh, with skin still on the bird. Marel Stork's duck pluckers are based on the well-known A-frame concept and have adaptable plucking speeds and adjustable individual beams. Their position can be altered and there are frequency converters at the breast side, all to optimise the plucking result.

Waxing for perfect skin presentation

In duck processing, perfect breast skin presentation is essential. Feathers should be completely removed, but the skin must remain undamaged. Marel Stork is a master of the waxing process. A fully in-line, compact waxing system has been installed at Donstar, including an efficient wax recycling

system. Products are conveyed through a bath filled with plucking wax. Then they are immersed in a wax cooling tank. Here the wax solidifies and is ready to be removed automatically in a wax peeler, taking off pins and smaller feathers as it peels. The wax is recycled. It is melted, filtered and brought back into the process to be re-used at the correct temperature.

Evisceration

The entire viscera pack is removed completely in a single automated operation. The viscera pack is hung over the breast side. In various automated steps, the ducks are prepared in the best possible way for chilling and all other downstream operations. Harvested giblets are chilled in-line and distributed. Feet are processed into valuable products. After air chilling using the Stork Downflow Plus chilling concept, whole products are selected by weight and quality and then processed in the Marel Stork cut-up area.

Labelling & packing solutions

At the end of the process, products are weighed, batched, packed and labelled in the most efficient way using a Marel Weigh Price Labeller. Labels are produced with the support of user-friendly Innova Software. The labelling module is part of the complete Marel Innova software solution. This solution enables plant management to oversee the processes and their KPIs, allowing any necessary remedial action to be taken at an early stage.

For Marel Stork, Donstar is the latest successful, high speed, automated duck processing greenfield project. It brings the best and latest dedicated duck processing technology together and enables Donstar to stay in pole position in duck processing. The Utolina brand has every opportunity to build on its popularity.

At the end of the process, products are weighed, batched, packed, labelled and sent on their way to Russian customers.



DUCK PROCESSING TECHNOLOGY



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Chicken run

An unfortunate accident involving the transport of day-old chicks on the motorway near the Chinese town of Binzhou left a large number of the animals on the street. Inhabitants of the surrounding houses, as well as passers-by, took the opportunity to salvage as many animals as possible. The chicks still on the truck were left untouched, but every animal that fell out or escaped after the accident was rescued from the scene to be added to private backyard farms. The Chinese press estimates the loss in livestock to amount to some US\$7,800.





Water quality deserves ongoing attention

Broiler farmers generally have full confidence in the drinking water they supply to their broilers. Especially when it is obtained from the water supply company. Yet this confidence often appears to be unjustified. Research in the Netherlands showed that almost 8% of water at nipple level is unsuitable and almost 20% is less suitable as drinking water for poultry.

By Jan van Harn, Francesca Neijenhuis and Hilko Ellen,
Wageningen UR Livestock Research

It is important that drinking water from the water supply network or a farm well is of good quality, but it is just as important to have good-quality drinking water in the area of the drinking point (the nipple). The quality of drinking water is mainly affected by the possible presence of biofilm, a slimy layer on the inside of the water pipe. A biofilm in a water pipe is formed when micro-organisms grow on deposits of minerals and (organic) dirt particles form on the side of the pipe. Increased amounts of iron, manganese, lime, and such, in the water increase the chance that biofilm will form. It can also lead to extra wear, blockages and

PHOTO: JAN WILLEM SCHOUTEN



leakages. The substances and excipients used for things such as vaccines, antibiotics, vitamins and wormers could stimulate the growth of biofilm as well. Bacteria that could be present in a biofilm include Legionella, E. coli (including the bacteria producing ECBL), Campylobacter, Pseudomonas, Salmonella, as well as Enterococci and Clostridium perfringens. In short,

Tips for good drinking water

Check whether your water installation has sufficient capacity (peak loads). Preferably use PVC materials. Check your installation: Is the filter situated at the front of the water pipe system? Are there any unnecessary bends? Are there any dead-end pipes? Is your supply pipe line sagging? Make the necessary adjustments. Have the drinking water checked regularly (four times a year). Have the water quality analysed both at the source and in the area of the animal (chemically and bacteriologically). Clean the filter after every regular round. Clean and disinfect the water pipe after every regular round. Make sure your dosing system works properly and you have the correct dosage (preparation solvent). Check the operation of the pressure regulator of the drinking lines on a regular basis and make sure

that the water level in the corresponding piezometer tube is clearly legible. Check regularly whether the water supply of the nipples is evenly distributed in the drinking line. Flush the drinking lines frequently during the round, especially when it concerns young animals. When drinking lines are not being used the first couple of days, flush these before use. Flush the drinking lines prior to and after administering medication or vaccines. Check the smell, clarity and colour of the water yourself during your regular round. A (transparent) water filter helps identify discolouration in turbid water at an early stage. Make sure the drinking line hangs horizontally and does not sag. Make sure the drinking lines hang at the right height. Replace leaking or malfunctioning nipples immediately.



virtually the whole spectrum of bacteria that occur in nature can be found in the biofilm. Of all bacteria present in the drinking line, the majority (95-99%) is situated in the biofilm. When these bacteria present in the biofilm 'break away', they end up in the water and form a potential threat to animal health. The presence of biofilm in the water pipe can lead to reduced production, health problems, the decomposition or removal of additives, a reduced effectiveness of medication / vaccination, blockage or leakage in nipples and a possible contribution to resistance. Recent research of the GD showed that 20 weeks after administering medication in drinking water, there were still residues and traces of antibiotics present.

Problems not directly connected to source

Problems with the quality of drinking water at the nipple can arise in both water from an on-site well and water from the water supply company. But the risk of problems occurring is bigger with water from a farm groundwater source. Indeed, this can contain high concentrations of manganese, iron, nitrate and/or nitrite. Something one will not find in water from a water supply company. But, as mentioned before, problems with the quality of drinking water can also arise in water obtained from a water supply company, namely problems

arising in the water pipe inside the house. The temperature in the broiler houses is ideal for the development and growth of micro-organisms. Broilers are kept at temperatures between 32-36 °C. In addition, the water flow is not very good during the first few days that the broilers are indoors. Suppose there is a house with 30,000 vacancies for broilers and in this house there are 6 drinking lines (ø 30mm) 70 metres long. In this case, there are almost 300 litres of water in the drinking lines alone. Assuming a broiler consumes twice as much water as feed in the first week, the daily water intake in the first week varies from 25 ml (day one) to 70 ml (day seven). This means the daily water use of the entire house ranges between 750 litres (day one) and 2,100 litres (day seven). In other words, 2.5 – 7 times the capacity of the drinking system.

Monitoring the quality of water personally

A broiler farmer is able to monitor the water quality quite easily. It is recommended that he monitor it every regular round, so he can intervene in the case of possible derogations. An appropriate moment to monitor the drinking water quality is when the broilers are between seven and 14 days old, because that is just after a critical period of high temperatures and poor flow in the drinking lines. How can a broiler farmer monitor

The temperature in the broiler houses is ideal for the development and growth of micro-organisms.



PHOTO: VAN ASSENDELF

Once the water pipe is uncontaminated, it can be kept clean by adding (a low dose of) disinfectants/detergents to the drinking water.

the water quality himself?

Look and smell

Tap some water in a clean, glass jar at the beginning and at the end of the water installation. Tap some water from the faucet in the kitchen for the purpose of comparison. Shake the jars and leave them untouched for 30 minutes. Assess the colour, clarity and sediment of the jars against a white background (e.g. white paper). In addition, assess the smell of the water. Water is supposed to be clear, odourless and colourless. If the water is clear and does not smell, the likelihood of it being suitable drinking water is 85%. But if the water is turbid and smelly, something might be wrong with the quality and action should be taken. If you do not trust your own eyes and ears, take the water to an authorised laboratory for screening.

Wastewater detector

By installing a wastewater detector in the drinking line, the clarity/turbidity of the water is measured constantly through light measurement. If the sensor detects 'polluted' water, the drinking lines have to be rinsed out. This could be done either manually or automatically.

ATP kit

Another possibility is to check the water quality by means of

an ATP kit. By using this kit, it is possible to get an idea of the (microbial and organic) pollution in the drinking water within a few minutes, instead of a few days. Please note that it is not possible to determine the kind of bacteria present in the water (E. coli, Campylobacter, Salmonella, Legionella, etc.), only to indicate the presence of bacteria. An (electronic) pH gauge is often included in the ATP kit. If this is not the case, it is recommended to purchase one. Using litmus paper strips is also an option. In this way, it is quite feasible to monitor the quality of drinking water during the regular round.

Preventing and removing the biofilm

If it turns out that the water at the drinking points is contaminated, the polluted water pipes and the system (such as the supply tank) should be properly cleaned. Decomposing the biofilm is difficult. Drinking water pipes are not suitable to clean with a brush. That is why broiler farmers are dependent on detergents and flushing the pipes using high (water) pressure. There are also systems that can blow pulsating air through the drinking lines. Furthermore, drinking lines can be cleaned ultrasonically. Mechanical vibrations are generated with an ultrasonic noise, which will loosen the dirt through vibration, as it were. In this way, it is possible to clean a drinking line mechanically. Of course, combining mechanical cleaning and detergent to remove the biofilm is also a possibility. Once the water line is uncontaminated, it can be kept clean by adding (low doses of) disinfectants/detergents to the drinking water. Please note that the substances must be allowed as additives to drinking water. The substances may be added to the drinking water continuously or periodically (add it a few days and then stop a few days). Please bear in mind that most substances inactivate vaccines or reduce the effect of antibiotics. So if a vaccination or a medicinal treatment is planned, the water treatment must be stopped in time and the water pipes must be flushed prior to commencing the medicinal treatment.

Table 1 - Cut off values for drinking water for poultry.

Parameter	Good	Bad
Chemical		
pH	5 tot 8	<4 en >9
ammonium (mg/L)	< 1	>2
nitrite (mg/L)	< 0.1	>1.0
nitrate (mg/L)	< 100	>200
chloride (mg/L)	< 200	>300
sodium (mg/L)	< 100	>200
iron (mg/L)	< 0.5	>2.5
manganese (mg/L)	< 0.5	>1.0
sulfate (mg/L)	< 100	>250
Bacteriological		
yeasts and moulds (kve/mL) *	-	>10,000
E-coli (kve/mL)*	<10	>100
Totaal cell count (per/mL) *	<10,000	>100,000
Chemical oxygen use** (mg/L)	<50	>100

Biofilm an invisible risk of disease

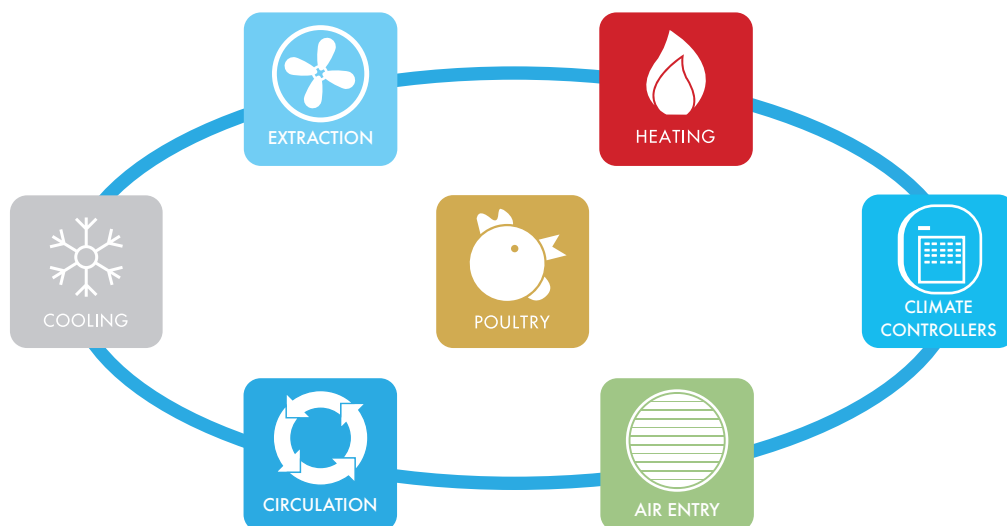
It is not immediately visible. It is a deposit of minerals, organic materials and bacteria, yeasts and fungi on the inside of the drinking line. It can develop extremely rapidly and contaminate the clean water during transport, which is an increased disease risk for animals. It can clog the pipes, block nipples or cause leaks in nipples (leakage). It can decompose additives in the drinking water and reduce the effectiveness of vaccines and medication. Factors that affect the development of biofilm are: stagnant water, temperature, installation and materials of water pipes, additions to the drinking water (including, vaccines, additives and medication).



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Improve eggshell quality during heat stress

Maintaining the highest percentage of first grade eggs, even during heat stress, is essential for commercially viable egg production.

Heat stress in layers has a severe negative impact on eggshell quality. The addition of certain supplements to the bird's diet could alleviate the effect of heat stress on acid-base imbalance, plasma Ca concentration, egg production and egg quality in commercial layers.

T. Sasidhar, K. Rajendran, K. Mani, T. Vasanthakumar, U. Prabhakaran, S. Ramya, S. Durga, Veterinary and Animal Sciences University, Namakkal, Tamilnadu, India

Eggshell quality is of major importance to the egg industry and also has a major economic impact on commercial egg production. Broken and cracked eggs represent an economic loss to egg producers. Some 6-8% of all eggs produced commercially are unusable because of poor shell quality. Numerous factors involved in eggshell quality include nutrition, age, stress and disease. But the most important factor which should be managed for the bird's health and to maintain good eggshell quality is heat stress.

Effect of heat stress

The extent of heat stress will be influenced by factors such as humidity and the extent to which the birds have become acclimatised. The deleterious effects of heat stress on eggshell quality appear to be due to several reasons. Both heat exposure and reduced appetite affect the laying performance and eggshell quality of birds exposed to high ambient temperatures.

Whereas egg production and egg weight are influenced to a major extent by the reduction in feed consumption, eggshell quality is influenced primarily by high temperature.

- Heat stress in birds causes many biochemical and physiological changes, such as shifts in acid-base balance, hyperthermia, increased oxygen consumption and the release of carbon di-oxide, increased production of free radicals and corticosterone.
- Depressed feed intake results in decreased calcium consumption.
- At high temperatures, birds pant to enhance evaporative cooling. Panting results in respiratory alkalosis, which is caused by loss of carbon dioxide from the blood and involves an increase in blood pH. This, in turn, decreases the proportion of the blood calcium that is in the ionised form and reduces the amount of calcium available for eggshell formation.
- The activity of carbonic anhydrase (the enzyme which produces bicarbonate for shell formation) is also reduced during heat stress and blood flow to the uterus is also decreased.
- Under high temperature, blood flow within the body is changed and more blood flows to peripheral tissues to transfer

more heat from the body core to the surface. The decreased concentration of plasma calcium and the partial pressure of carbon dioxide is attributable to respiratory alkalosis.

- Reduction in shell weight.
- Low shell thickness.
- High eggshell reflectivity. The light coloured shell of the eggs laid during heat stress is due to the reduction in pigment deposited in the cuticle.

Bicarbonate supplementation

Loss of carbon dioxide is accentuated by the need for blood bicarbonate to buffer the hydrogen ions produced during eggshell formation. A reduced bicarbonate concentration in the lumen of the shell gland adversely affects eggshell quality, leading to the laying of rough-shelled eggs. It is therefore possible that, at high temperatures, hens have a nutritional requirement for bicarbonate in order to improve eggshell quality by supplementing the diet with sodium bicarbonate at the rate of 2-2.5 kilogram (kg) per tonne of feed.

The eggshell formation occurs normally during dark periods, but sodium bicarbonate intake by birds does not happen during dark periods. In order to improve sodium bicarbonate intake, the birds are provided with an extended photo period of 18 to 20 hours. An extended photo period does not affect egg production during heat-stressed conditions. Continuous lighting allows hens to consume the dietary supplements during the period of active eggshell formation. If sodium is increased by supplementation with sodium bicarbonate, then, to balance the higher level of sodium, ammonium chloride is supplemented along with the sodium bicarbonate at the ratio of (40:60).

Zinc supplementation

Carbonic anhydrase is reduced during high temperatures. Carbonic anhydrase is required to form bicarbonate that passes through the shell gland to form calcium carbonate. So zinc supplementation in the form of zinc methionine or zinc propionate increases the carbonic anhydrase activity that alleviates the effect of heat stress and maintains better eggshell quality.

Potassium Chloride supplementation

Water is an essential nutrient which facilitates the transfer of the minerals (Na⁺, K⁺, Cl⁻). The water intake during summer increases to three times the feed intake. The water circulation in the body system reduces body heat. In cases of heat stressed birds, the water intake becomes suppressed. So, along with the water, potassium chloride mixes at the rate of 0.5-0.6%, improves the water intake by 90%, increases evaporative heat loss by 80% and increases apparent respiratory efficiency by 25%.

Chromium and Manganese supplementation

Heat stress effects are counteracted by chromium (Cr) and manganese (Mn) supplementation in feed. The addition of 20 milligrams (mg) of Cr/kg and 120 mg of Mn/kg of diet alters eggshell thickness.

Ascorbic acid supplementation

Ascorbic acid is a natural supplement available to alleviate heat stress in layers during hot weather. Adding 5 millilitres of lemon juice per litre of drinking water will reduce eggs with broken and fragile shells. The useful effect of lemon juice on

the eggshell quality of heat-stressed birds could be due to ingredients such as the ascorbic acid in lemon juice.

Although poultry can synthesise vitamin-C, its quantity becomes insufficient during heat stress as a result of its increased rate of usage to combat the free radicals generated. Vitamin C supplementation at 500 parts per million (ppm) is beneficial to maintaining bird performance, including interior and exterior egg quality under severe environmental stresses. The decline in eggshell quality is affected not only by the decreased intake of calcium and phosphorus, but also by the depletion of the ascorbic acid required for the conversion of 25-hydroxycholecalciferol-r into the one 25-dihydroxycholecalciferol produced in the kidneys, which is essential for regulating calcium metabolism and eggshell calcification.

Vitamin-E supplementation

In a normal bird, there is sufficient antioxidant capacity to remove active oxygen; but when exposed to environmental stress, this may be depressed. Through its intra-membrane antioxidant properties, vitamin E may protect tissue membranes from the lipid peroxidation caused by free radical attacks and it alleviates the effects of environmental stress in laying hens. Supplementation of vitamin C at 200 mg/kg and vitamin E at 250 mg/kg in the diet can ameliorate the detrimental effects of heat stress and improve the egg quality parameters of egg weight, eggshell weight, albumen and yolk weight.

Cost-effective measures

Measures to alleviate the effects of heat stress by adding supplements to the bird's diet could alleviate the effect of heat stress on acid-base imbalance, plasma Ca concentration, egg production and egg quality in commercial layers. These are the cost-effective ways of combating heat stress without creating additional stress in birds. Egg breakage will be reduced and fertility and hatchability will be improved in parent flock.

References available upon request



A detailed sculpture of a rooster, where its feathers are meticulously crafted from various international banknotes. The head is primarily red and pink, with a prominent red comb. The neck and upper body feature a mix of red, yellow, and green notes. The wings and tail are composed of numerous long, pointed feathers made from light-colored and green banknotes. The background is a dark, textured surface with faint, large characters.

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Improving vitamin D status boosts breast meat yields in broilers

Global meat consumption continues to rise: according to the OECD-FAO, it is projected to increase by around 1.6% a year from 2013 to 2022. Poultry meat uptake per person will increase faster than that for pork or beef, growing by some 9% between 2013 and 2022. Increasing meat yield is essential to meet the extra demand.

By DSM

Legislative constraints on poultry production, such as the environment, hygiene and welfare, have increased production costs and pushed up profitability thresholds. Further commitments under quality schemes have also increased costs and so margins for broiler producers largely depend on final product characteristics, such as meat quality, the live weight of the birds, the feed conversion rate and meat yields.

When the birds are processed, the meat products – such as the whole carcass, the parts and the further processed products –

are sold and distributed. Nowadays, the global broiler industry has advanced to the point that every gram of meat has value, with the most valuable part of the broiler generally being the breast in many countries. Breast meat yield may therefore offset 'losses' incurred in feed conversion rate and/or daily gain. In broilers, increased serum levels of 25-hydroxycholecalciferol (25-OH-D3, tradename Hy-D®), the first metabolite of vitamin D3, have been positively correlated with increased body weight, improved feed conversion and higher breast yield. *Figure 1* demonstrates the increase of breast meat yields obtained in several experimental and field trials with broilers when fed with HyD®, compared with a diet supplemented only

with vitamin D3. The outcome of 26 trials revealed that the addition of Hy-D® to the broiler diet can enhance breast meat production by almost 1% compared with standard production methods in which the feed is supplemented with vitamin D3 as the sole source of vitamin D.

Explain excellent results

25-OH-D3 promotes muscle formation and development. The impact of 25-OH-D3 on skeletal muscle development is an exciting and interesting area of research. Some preliminary studies have attempted to shed light on the action of this metabolite of vitamin D3 on the myogenesis to explain the excellent results obtained at the processing plants.

Berri et al. (2013) and Hutton et al. (2014) have conducted similar studies to evaluate the effect of 25-OH-D3 on skeletal muscle growth and on the involvement and activity of the satellite cells in broiler chickens.

It is well known that, during the embryonic phase, the cells called myoblasts proliferate and differentiate, thanks to growth factors and hormones, so as to generate the muscle fibres.

During this process, the fibres increase in number (hyperplasia) and then their number is fixed at birth. After hatching, the muscle cells can only grow in size (hypertrophy) if additional DNA is available. The satellite cells are the source of the DNA that enables cell proliferation.

Studies show promising results

In the studies of Berri and Hutton, the gene expression of certain myogenic factors were analysed to determine if there is a

link between them and the circulating levels of 25-OH-D3. The results showed a greater proportion of proliferative satellite cells in the breast muscles of the birds fed with a combination of vitamin D3 and 25-OH-D3, compared with the broilers fed only with vitamin D3. Moreover, the number of vitamin D receptors (VDRs) was increased in chicken supplemented with Hy-D®, suggesting that this metabolite can enhance the metabolic activity of vitamin D and modulate the expression of specific genes linked to muscle development. These preliminary results may help to explain the enhancement of broiler breast meat yields at the processing plant.

Vignale et al. (2015) carried out another study to determine the effect of 25-OH-D3 on protein synthesis through the activation of the mechanistic target of the rapamycin (mTOR) pathway. The mTOR is a protein that is a key regulator of cell growth and proliferation in response to nutrient availability and growth stimuli, and is related to protein synthesis.

In this trial, four different feed treatments were tested: 1) a control diet with 2,760 IU/kg of feed of vitamin D3; 2) a higher (double) amount of vitamin D3, 5,520 IU/kg feed; 3) a combination of vitamin D3, 2,760 IU/kg feed and 25-OH-D3, 2,270 IU/kg feed; and 4) a combination of vitamin D3 and 25-OH-D3 as in treatment (3) for up to 21 days, and then only vitamin D3, 2,270 IU/kg feed up to 42 days (end of trial).

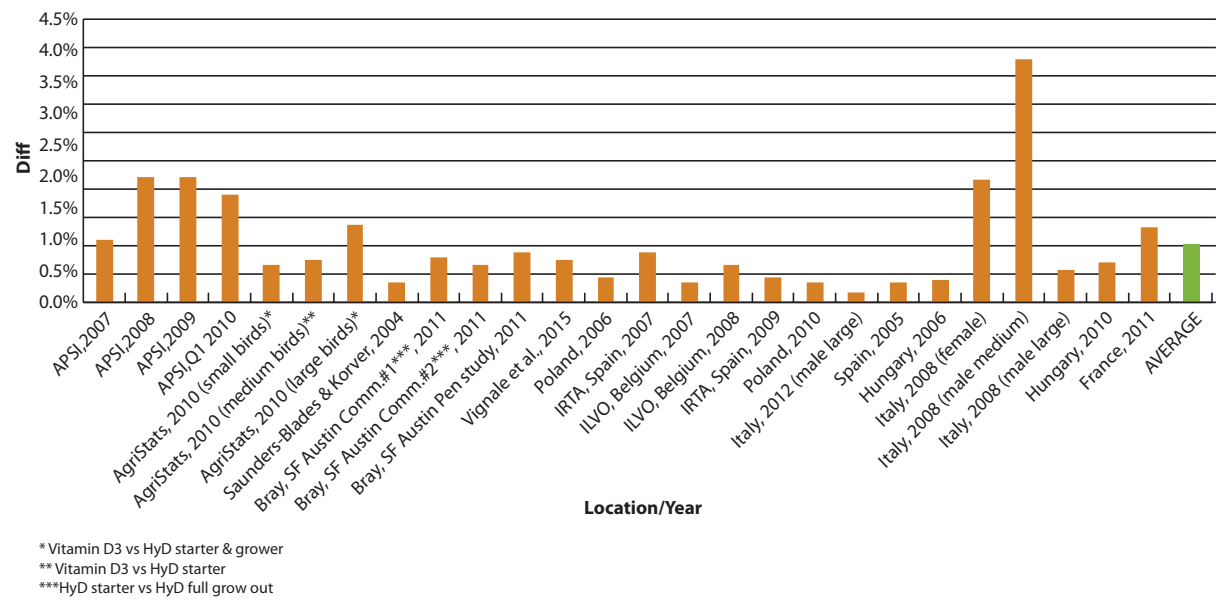
Protein synthesis

The analysis of the expression of the mTOR, the gene related to protein synthesis, showed a significantly higher expression of this gene in treatment (3), birds fed 25-hydroxycholecalciferol

Nowadays, the global broiler industry has advanced to the point that every gram of meat has value, with the most valuable part of the broiler generally being the breast in many countries.



Figure 1 - Percentage points of breast meat yield increase in birds fed Hy•D® compared to birds fed only vitamin D3.



for the full cycle. In the same group of birds, a significantly higher protein synthesis rate was also found. Moreover, in agreement with previous results, the broilers supplemented with HyD® for the full period also showed a markedly higher concentration of VDRs, suggesting again a link between the circulating levels of 25-OH-D3, the concentration of VDRs, and the gene transcription and activation.

As shown in Figure 2, the birds whose diet was supplemented with Hy•D® also performed better in terms of breast meat production. Surprisingly, birds fed with a higher amount of vitamin D3 showed the same meat production as did broilers fed half the dose of D3.

Collectively, these findings indicate that improving the

vitamin D status by feeding 25-hydroxycholecalciferol to broilers can stimulate the activity of the satellite cells, which are muscle fibre support cells necessary for increasing fibre hypertrophy (size) and which also stimulate protein synthesis. It is important as well to notice that levels of 25-OH-D3 in the blood are not affected by doubling the vitamin D3 content of the diet (Figure 3). More studies are probably necessary to elucidate all the aspects of the metabolic effect of 25-OH-D3, but the research conducted so far indicates a strong correlation between dietary supplementation with 25-OH-D3 and improved breast meat production in broilers.

References available upon request

Figure 2 - Effect of Hy•D® diet supplementation on broiler breast meat yield (P<0.05).

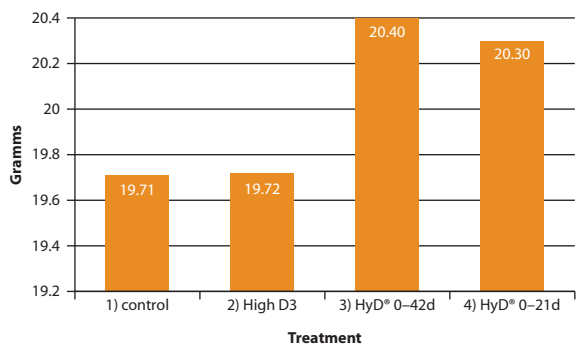
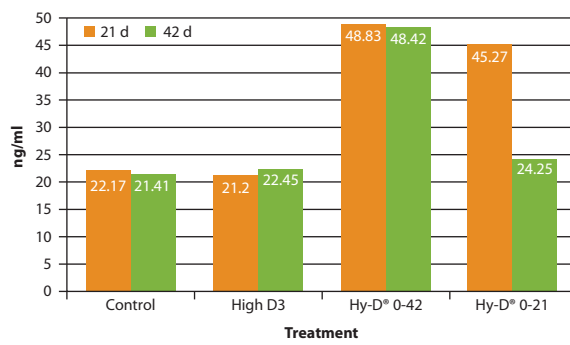


Figure 3 - Effect of Hy•D® diet supplementation on serum levels of 25-OH-D3 (ng/ml).





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Feed additives with a track record

There are plenty of feed additives on the market. Some have an impact, some less of one. The nutritionists at Aviagen describe the performance of key additives that have been tested in trials, the results of which have been published in peer reviewed journals.

By Sandro Cerrate, Aviagen nutritionist

The beneficial effects of commercially available poultry feed additives have been extensively promoted, but deciding which, if any, may be of economic benefit to an individual operation can be challenging. Innovative products that might result in better performance under one specific set of conditions may not yield the same results under a different set of conditions. Sufficient repetition of experimental studies in different labs and proven efficacy in commercial trials are the best way of establishing which feed additive may be useful in a given operation.

Prebiotics and probiotics

Prebiotics are non-digestible feed ingredients, such as oligosaccharides, that positively affect the activity and growth of beneficial microflora in the gastrointestinal tract. Capable of surviving under a wide range of environmental conditions, the bio-efficacy of prebiotics tends to be less variable than that of probiotics, which are fed as a culture of live micro-organisms. The mode of action of these two products is similar in that they both work by increasing the amount of beneficial ('good') microflora in the gut. For example, an increased number of lactic-acid-producing bacteria results in a higher production of short-chain fatty acids and this reduces the pH in the intestine, improving the absorption of certain nutrients such as protein, calcium and phosphorous.

In broiler chickens, the beneficial effects of prebiotics will depend on the level of inclusion, the type of oligosaccharide, and the composition of the basal diets. In broilers, fructo-oligosaccharides tend to have greater impact, as do mannano-oligosaccharides and inulin to a lesser degree. The addition of inulin and oligofructose to the diets of broiler breeders has resulted

in improved egg production and shell quality.

The addition of probiotics to the diets of both broilers and breeders is a viable strategy with generally positive results during periods of challenge. However, probiotics tend to give a less predictable effect than prebiotics because their efficacy is determined by the bird's physiological state and product quality, which is sensitive to the environment. In addition, the presence of antibiotics or anticoccidials may affect probiotic activity.

Acidifiers

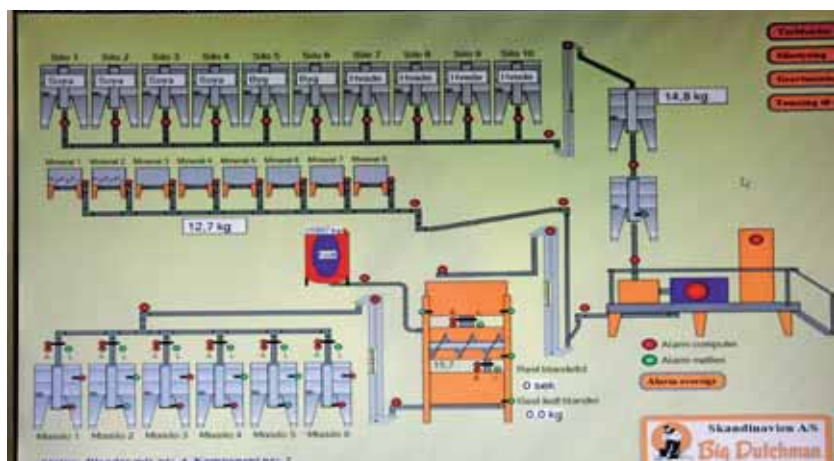
Despite the fact the benefits of acidifiers (short-chain fatty acids) have been successfully tested across numerous research institutions, their inclusion in poultry diets has yielded mixed results. The method of administration (whether they are encapsulated or conjugated), inclusion level and environmental conditions influence the efficacy of these products.

Acidifiers reduce the pH of feed and the gastrointestinal tract, increase the absorption of calcium and protein, and inhibit the growth of pathogenic microbes in the gut. In broilers, fumaric, propionic, formic and butyric acid have been shown to improve FCR, although combinations of these seem to produce a more predictable result. In broiler breeders, the addition of acidifiers to the diet has consistently resulted in increased egg production and shell thickness in aged hens and during high environmental temperatures.

Emulsifiers

Effective biosurfactants, suspended in emulsions of water and

In the making of compound feed, many ingredients and especially micro-ingredients are used. This is based on costs and presumed effectiveness.





A standard feed does not exist, batches are increasingly tailor-made.

oil, are useful for enhancing the digestibility of fatty acids and therefore, potentially, bird performance. Their effectiveness will depend on the type and levels of fats included in the basal feed, as well as the type of emulsion added.

Palm oil (80% of palmitic acid) at 3% inclusion with 0.03% of glyceryl polyethylene glycol ricinoleate has been shown to improve FCR and reduce the incidence of pasty vent in broilers; the likely mode of action was regulation of fatty acid production from the caeca (improved fatty acid digestion, reducing fat excretion). Similarly, high levels of palmitic acid (8%) or a mixture of palmitic acid (4%), oleic acid (4%) and cholic acid (0.2%) have been shown to increase dietary ME and improve FCR and body weight. The inclusion of the emulsifier lecithin at a level of 0.5% improved the performance of birds fed a diet with 1.5% soybean oil, yet increasing levels of lecithin (1-2%) did not improve the performance of birds fed 2-2.7% or 1-2% soybean oil. In laying hens, egg production and hatchability have been positively affected by the inclusion of 3% of lecithin due to better fat mobilisation from the liver to egg yolk.

Antioxidants

The use of synthetic antioxidants to maintain feed quality has been tested extensively. For example, ethoxyquin has proven to reduce fat rancidity and feed deterioration and is most effective when feeds are stored for long periods of time or when levels of peroxide (toxic by-products of rancidity) are equal to or higher than 4 mEq/kg of feed.

Vitamins A, E and C have antioxidant properties. A recent study has shown that, in breeders, Vitamin A reduces lipid degradation (peroxidation) in the yolk, leading to improved hatchability and fertility, and reduced early and late embryo mortality. The reduction of lipid peroxidation in eggs from broiler breeders fed canthaxanthin is more accentuated when the eggs are stored for a prolonged time.

Vitamin E protects the high concentrations of polyunsaturated fatty acids found in sperm, aiding fertility in males. Studies completed in broiler breeder females have shown that feeding them vitamin E results in better egg production and hatchability. Reduced egg lipid peroxidation will allow for improved lipid utilisation by the embryo and young chick, although supplementing vitamin E to broiler breeders has not shown to improve viability and performance in the progeny chicks. In broilers, the addition of extra vitamin E to the diet mildly decreased the number of damaged fibres in the pectoral muscle of young broilers.

Under conditions of high environmental temperatures, high doses of vitamins A and E in poultry have resulted in improved performance. Vitamin C is most useful when environmental diseases or nutritional challenges are present. Yet improvements in performance are inconsistent; this inconsistency in performance may be linked to the instability of vitamin C during storage. The use of coating substances can significantly improve the storage stability of vitamin C and the consistency of performance benefits.

Carnitine

Carnitine is involved in the transport of fatty acids during the breakdown of lipids (fats) for the generation of metabolic energy. The addition of carnitine to the diets of broiler chickens might result in reduced abdominal fat and improved breast and/or thigh yield. The addition of carnitine to breeder diets may improve sperm concentration in roosters, as well as fertility and hatchability in breeder hens. The progeny of hens fed carnitine or the addition of carnitine to the diet of the chicks resulted in better yolk sac absorption.

Creatine

Creatine naturally occurs in vertebrates and helps to supply energy to all cells in the body, particularly muscle. The use of creatine as an additive to all vegetable protein poultry diets (which have no naturally occurring creatine present) has recently been investigated. A precursor of creatine, known as guanidinoacetic acid, has been added to diets as it is less expensive and more stable than creatine itself. The addition of this additive to all-plant protein-based diets has proved effective in improving energy utilisation and FCR in diets with adequate ME levels, although benefits in low ME diets seem to diminish. The feeding of creatine or one of its precursors may also be beneficial in diets low in arginine. Because the synthesis de-novo creatine utilises arginine, this additive might also promote growth due to the sparing effect of arginine.

Nucleotides

While the use of nucleotides has been shown to positively improve the growth and immune response of piglets, in broiler chickens their benefits for performance are limited. Physiological differences during the de-novo synthesis of nucleotides in mammals and birds might explain this difference; the need in chickens for additional nucleotides may be smaller than that of piglets. Furthermore, variations between sources of nucleotides derived from yeast might also contribute to the lack of positive responses observed in chickens.

Enzymes

Over the last 25 years, countless studies have been conducted reporting the benefits of exogenous enzymes in poultry feeds. As a consequence, there are a large number of commercially available enzymes for inclusion in poultry feeds. While not all enzymes have been shown to work consistently, the number of commercially available enzymes is so large that their use in poultry feeds is common practice nowadays. There are three broad categories of enzymes used in poultry feeds; Carbohydrases, which improve the digestibility of carbohydrates; proteases, which improve the digestibility of proteins and phytases,

which make plant-derived phosphorus more available. The use of phytases, for example, is widely accepted, well-defined and the benefits have been proven. It is well-known, for example, that the efficacy of cell wall degrading enzymes largely depends on the cereal used in the diet. On the other hand, the uses of other enzymes, e.g. proteases, are still not well-defined. The addition of exogenous proteases often does not result in a discernable benefit in performance and this lack of correlation between the digestibility of protein and the performance might suggest an over-stimulation of endogenous enzymes when exogenous proteases are added.

But the inclusion of proteases in lower doses and in combination with other enzymes (e.g. phytase and xylanase, a type of carbohydrase) has resulted in better, more predictable performance, suggesting synergy in the mode of action between enzymes.

Vitamin D

Vitamin D plays a crucial role in calcium metabolism. The inclusion in birds of cholecalciferol (D3), calcidiol (25-OH-D3), or calcitriol (1.25-OH2-D3) results in a positive response on eggshell quality. The addition of products containing vitamin D is most relevant in older hens. Furthermore, the inclusion of these additives in the water instead of feed has sometimes resulted in better response to improve the eggshell quality.



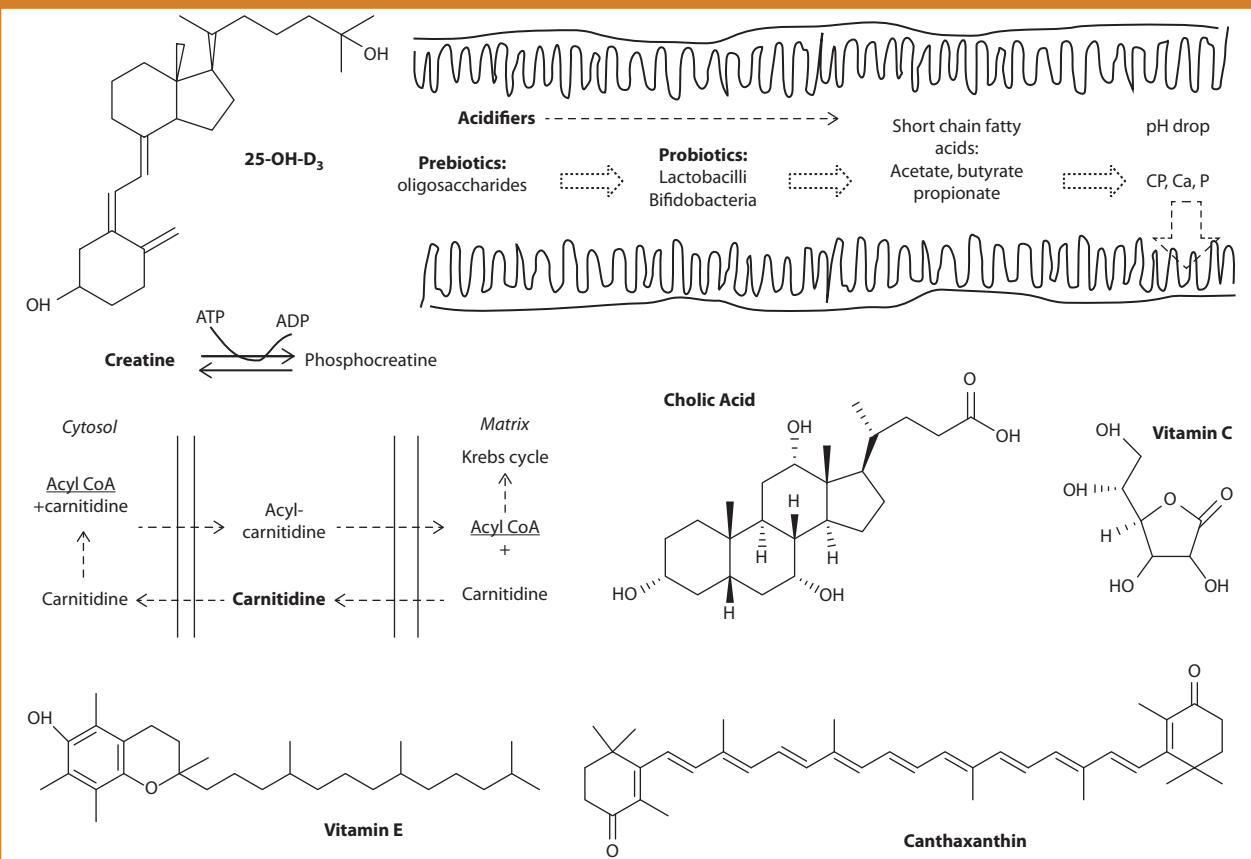
Benefits

Feed additives broadly fit into several different categories, each category with a slightly different mode of action. All purport to have beneficial effects on digestive function; improving the digestibility of nutrients, improving gut microbe balance, protecting dietary nutrients from degradation and so on. While the benefits of some are well-proven and consistent, the effects and efficacy of others are less proven. Nevertheless, during periods of challenge, whether it is environmental, nutritional or managerial, these feed additives may provide some benefit for performance in both broilers and breeders.

The beneficial effects of commercially available poultry feed additives have been extensively promoted, but deciding which, if any, may be of economic benefit to an individual operation can be challenging.

References available upon request

Figure 1- Mechanisms or molecular structures of additives.



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Eliminating dietary phytate through phytase superdosing

By aiming to completely degrade all soluble phytate in the diet, superdosing with an appropriate phytase effectively eliminates its anti-nutrient effects, producing 'extra-phosphoric' benefits.

The use of phytase superdosing in feed to target more than 85% of phytate for destruction is currently generating more interest than the standard use for phosphorus release. The addition of typically three to four times the standard dose of phytase to quickly destroy all phytate present in the diet is now well-proven in poultry, delivering improved nutrient utilisation and increased animal performance.

By Hadden Graham, technical director, AB Vista

To fully grasp the potential benefits available from superdosing, it is important to first understand the impact plant phytate can have, both as a nutrient and as an anti-nutrient. The former is the result of high levels of potentially available P – an economically valuable nutrient – whilst the latter is due to the detrimental effects phytate has on nutrient digestibility.

Anti-nutrient effects of phytate

In binding to essential nutrients within the upper gastrointestinal tract, phytate not only renders them considerably less available to the bird, but also forces the bird's digestive system to produce additional digestive secretions in an effort to compensate. This is both nutrient-inefficient and potentially damaging to the delicate gut wall lining.

To date, phytate has been implicated in reduced calcium, zinc, magnesium, sodium and copper digestibility, whilst also

reducing the digestibility of amino acids by 3-16%, depending on the makeup of the diet. Undigested protein reaching the lower levels of the gastrointestinal (GI) tract can trigger an increased production of pepsin and acid in the proventriculus. This increase in acidic content requires additional protective mucus to be secreted in the small intestine and increases sodium bicarbonate secretion from the pancreas to achieve the required buffering.

The net result is an increase in bird energy requirements and in the secretion of both sodium and sialic acid. It is also important to note that investigating the anti-nutrient effects of phytate is not straightforward, since any change in feed ingredients can alter not only the level of phytate but also other nutrients and anti-nutrients, such as non-starch polysaccharides. This is the reason why nearly all studies on phytate interactions *in vivo* involve the use of semi-purified diets. For the poultry producer, however, perhaps the clearest indicator of the benefits of eliminating phytate comes from the overall impact that superdosing phytase has on bird performance.

Superdosing benefits

While the use of a modern phytase at a typical 500 FTU/kg feed dose rate can provide worthwhile feed cost savings by releasing 0.10-0.15% available P (avP) from dietary plant phytate, it is now understood that this represents only a fraction of the potential benefits available from phytase use. By aiming to completely degrade all soluble phytate in the diet, superdosing with an appropriate phytase effectively eliminates its anti-nutrient effects, producing 'extra-phosphoric' benefits (i.e. beyond simple P release). These include increased feed intake, improved nutrient digestibility, additional mineral release and less energy demand on digestion. In practice, the use of high doses of phytase can increase profitability through two principal means: maintaining the usual formulation savings from the associated 0.15% avP release with 500 FTU/kg of phytase and significantly improving bird performance due to the extra-phosphoric effects of superdosing phytase.

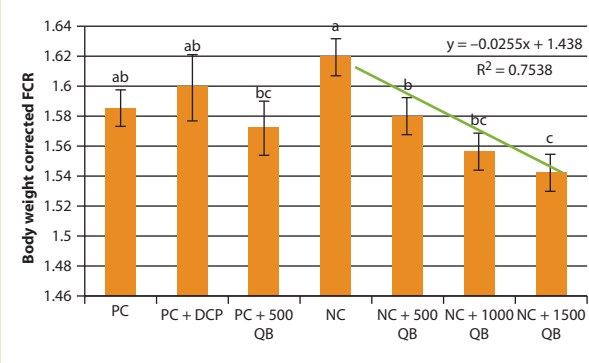
The clear impact of superdosing on the bodyweight-corrected feed conversion ratio (FCR) in 35/42-day-old broilers can be seen in *Figure 1*.

The result was an improvement in the feed efficiency of four points when comparing birds fed the 1500 FTU/kg phytase with those fed the more standard phytase inclusion of 500 FTU/kg in the NC diet. The fact that these benefits come from the extra-phosphoric effects of superdosing was confirmed by adding extra P (in the form of dicalcium phosphate, +DCP) to a normal P positive control (PC) diet. There was no improvement in performance in this +DCP diet relative to the PC; i.e. the improvements seen with superdosing were not related to additional avP supply.

Phytase characteristics for phytate elimination

The key to superdosing success is to achieve rapid and efficient phytate degradation at an early stage in the gastrointestinal tract, so as to maximise the time during which digestion and absorption processes can benefit. It is also important to be able to maintain continued phytate

Figure 1 - Impact of superdosing on body weight corrected, FCR in 35/42-day-old broilers.



degradation even at low concentrations in order to move towards elimination, rather than activity slowing down or stopping as soluble phytate levels drop. Simply reducing phytate levels will not achieve the full benefits of near-elimination. For example, at the standard level of phytase dosing, to release 0.10-0.13% avP, just 50-60% of the P locked up in dietary phytate needs to be released. Even those higher dose rates used to release 0.15-0.17% avP only require up to 70-75% phytate degradation.

In comparison, for the negative anti-nutrient effects of phytate to be eliminated, 80-85% of total phytate typically needs to be degraded. Given that some phytate is insoluble (unavailable), such high levels of phytate breakdown may require available (soluble) stomach phytate concentrations to be reduced to as low as 0.05% or below.

Optimal phytase activity for superdosing therefore differs from that required to simply release avP. It relies on the activity of the enzyme early in the gastrointestinal tract at low pH and also on other characteristics, such as intrinsic thermostability (to avoid delays to phytase release caused by coatings used to increase the thermostability of the product), protease resistance (to avoid the phytase degrading in the stomach), and activity at very low substrate concentrations.

Put simply, the ideal phytase for superdosing is intrinsically thermostable, able to survive stomach conditions, exhibits high levels of activity at low pH and degrades phytate at very low concentrations. The challenge facing poultry producers is that many commercial phytase products simply cannot meet these criteria and that activity at pH 5.5 and relatively high phytate concentrations (as used in the standard phytase assay method) does not relate to the activity needed in the animal.

Optimising performance

Superdosing phytase moves away from applying a dose-dependent nutrient matrix and focuses more on optimising animal performance, but an understanding of the factors that affect phytase superdosing performance is critical when making product choices. The potential additional value available from eliminating phytate through superdosing is substantial. As a result, it will likely lead to even greater phytase use in the future as poultry producers embrace the chance to further improve feed-use efficiency and bird performance.

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Groupe Grimaud

Jean-Marc Pinsault has been appointed deputy CEO of Groupe Grimaud as of 1 September 2015. He previously worked as general manager at Amélie and as deputy director general at Evolusion, specialising in milk and meat animal production. He will work in direct contact with Frédéric Grimaud, president and CEO of Groupe Grimaud.



EW Nutrition

EW Nutrition has reinforced its product management with the appointment of **Gregor Janknecht** as new



product manager for the Prote-N product line. For the past 17 years, he worked for one of the most established and acknowledged feed producers in Germany in different positions.

Hubbard

Hubbard has welcomed four new members to its R&D and technical team.

Julien Recoquillay will focus on genomic selection programmes for the Hubbard pure lines.

Paula Dias-Riboulet will work under the responsibility of **Yves Jégo** as a programme geneticist within the R&D department.

Magalie Nonis (pictured top) has joined as



nutritionist and broiler specialist and **Andrea Beneventi** (pictured bottom) has been appointed to the position of senior technical specialist. In addition **Jonathan Peeples** has joined Hubbard in the position of Southeast region sales manager in the US with sales responsibilities across five states.

Nutriad

Multinational feed additives producer Nutriad has appointed **Dr Adrian Krzykawski** as country manager Poland. He has held various senior positions in the animal feed industry.



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Enriched cages most sustainable

Battery cages were developed in the 1930s and their widespread use started in the 1950s. Over the years, this housing system for laying hens has been increasingly criticised in northern Europe for animal welfare reasons. Public concern led to an adjustment of European legislation to favour production systems that allowed hens to express their natural behaviour. Starting in 2012, the conventional cage has been banned and only enriched cages with a minimum space of 750 cm² per laying hen or alternative housing systems such as a barn, free-range and organic systems are allowed in the European Union. In the Netherlands, a further ban on enriched cages starts in 2021. Decisions on changing a production system should be based on a sustainability assessment that incorporates social, environmental and economic dimensions. As sustainability is a broad issue, indicators are usually used for quantification. In this study, the sustainability of enriched cages, barn, free-range and organic egg production systems following a predefined protocol was assessed. Indicators were selected within the social, environmental and economic dimensions, after which parameter values and sustainability limits were set for the core indicators in order to quantify



PHOTO: MICHEL ZOETER

Using equal weights for the indicators showed that, in the Dutch situation, enriched cage egg production was most sustainable. However, following legislation a further ban will start in 2021.

sustainability. Using equal weights for the indicators showed that, in the Dutch situation, enriched cage egg production was most sustainable, achieving the highest score on the environmental dimension, whereas free-range egg production gave the highest score on the social dimension (covering food safety, animal welfare and human welfare). In the economic dimension, both enriched cage egg and organic egg

production had the highest sustainability score. When weights were attributed according to stakeholder outputs, individual differences were seen, but the overall scores were comparable to the sustainability scores based on equal weights. *E. D. van Asselt, L. G. J. van Bussel, P. van Horne, H. van der Voet, G. W. A. M. van der Heijden, and H. J. van der Fels-Klerx, Poultry Science 94,1742–1750*

Influence of two-hand catching methods in broilers

In poultry production most steps are mechanised, whereas broiler catching is typically done by hand, since houses are not always suitable for the use of catching machines. In Germany, hand catching with five to eight workers is still standard. Catching is considered to be one of the most stressful situations in the life of a broiler. For this reason, recommendations for the catching process of broilers were made by the Council of Europe in 1995 and in 2000 by the Scientific Committee of Animal Health and Animal Welfare of the EU. Based on the recommendations of the Council of Europe for domestic fowl (*Gallus gallus*), national guidelines in Germany were published in 2012 banning one-leg-carrying of birds. However, meaningful data for catching birds by two legs are lacking. Reported lesions observed during catching (not always indicating the catching method applied) range between 4.5% and 15%. Studies from 1980 and 1990 do not always mention the type of transport cages used. In recent decades, plastic cages with a small opening on the top of the cage have been

used. Where possible, modular containers with cages resembling drawers with a wide opening are used. Studies have also focused on the catching and transport of birds and their influence on stress parameters such as blood cortisol concentration. In this study, the effects of two catching methods on body, leg and wing



PHOTO: ROEL DIJKSTRA

Mechanical catching equipment is not suitable for all types of houses.

lesions after the hand-catching of broilers by one or two legs for two weight classes (light animals: about 1.9 kg at pre-catching; heavy animals: about 2.5 kg at final depopulation) were compared.

Lesions on the body, legs and wings (haemorrhages and fractures) were recorded by a camera system located behind the plucking position. Two weight classes, two catching teams, and two flocks were included in the study. Heavy animals showed more lesions than birds of the light weight class. In all investigations, lesions on the body and legs were rare, whereas wing lesions occurred at a rate of up to 15.32%. Statistical analysis showed no significant difference between the two methods or between the catching teams for both weight classes. A correlation between lesions and weight was observed. During two-leg catching, the animals appeared to be more restless. Also, conditions for workers are considered harder.

Nina Langkabel, Maximilian P. O. Baumann, Annika Feiler, Arsooth Sanguankiat, and Reinhard Fries, Poultry Science 94,1735–1741

Sustainable egg production

If there is any industry in the world that knows how to efficiently produce animal protein it is the poultry and egg sector. Eggs in particular are not only nutritious, they are produced using the fewest of resources. Yet there are two reasons to increase our focus on sustainable egg production. The first and foremost is the fact that we know we are doing an excellent job, but there are many opportunities left untapped to communicate this to the broader public. The second reason to put greater emphasis on sustainable egg production is that every industry should continually challenge itself to improve.

This is why the International Egg Commissions Leadership Board gave the green light to launch a Global Round Table for Sustainable Egg Production. In the process that led up to this decision, we have had intensive discussions with WWF's Vice President of Food Sustainability, Carlos Saviani, to set the outline of the initiative. But this is just the start. This round table will follow the example of the Beef Industry: the Global Round Table for Sustainable Beef, a multi-stakeholder initiative with representation across the value chain.

The goal of the egg initiative is to achieve production that is environmentally sound, socially responsible and economically viable – achieved by continuous improvement in sustainability, through leadership, science, multi-stakeholder engagement and collaboration. Everyone has to be engaged in the process. The concept is to develop principles and objective criteria to define sustainable production. These then can be used by national or country round tables to benchmark their national initiatives. Possible principles that can be taken into account for the Global Round Table for Sustainable Egg Production (GRSE) are animal health, human health, the environment, natural resources and animal welfare. We have a truly fantastic industry and there is a great opportunity to first define and then communicate sustainable production.

Ben Dellaert initiated the initiative for sustainable egg production in his role as International Egg Commissions Vice Chairman. During the last global leadership conference of the IEC held in September in Berlin, Dutch native Dellaert was inaugurated as the organisation's Chairman.



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