On-farm hatching: more than just early feeding

On-farm hatching is a concept that was introduced in the broiler industry more than 10 years ago. The idea is to transfer the 18-day incubated eggs after the setting phase (and after candling and possibly in-ovo vaccination) to the broiler farm for the three-day hatching phase. Since that introduction, several on-farm hatching systems have been developed, especially in Europe.

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There is the clear and undisputed benefit in terms of chick welfare because of the complete elimination of various stressors, such as feed and water deprivation, exposure to noise, dust and pathogens in hatchers, chick handling, as well as transport of the day-old chicks to farms.

Other quantifiable advantages of all on-farm hatching systems are comparable and have been demonstrated in fundamental and applied comparative studies and in field conditions, demonstrating the added-value of on-farm hatching from a sustainability point of view.

There are technical and financial advantages for hatcheries (improved hatchability and less first week mortality claims), for farmers (lower FCR, better growth, drier litter and less veterinary costs) and for slaughtering and processing plants (less rejects, better uniformity, better yield and start of cycles on every day of the week).

From a bird's health point of view, reduced stress and uninterrupted early feeding will result in enhanced immunity and a faster intestinal development and hence drier litter and less footpad lesions. Another obvious outcome is less utilisation of antibiotics.

The latest development in on-farm hatching

With NestBorn, a new approach in on-farm hatching has been introduced in recent years. The system allows engagement with on-farm hatching without any investments or modifications in broiler houses, making it very accessible for all stakeholders.

With a NestBorn egg placing machine – belonging to the hatchery or integrator – hatching eggs can be transferred gently and directly from setter trays onto a natural litter bed in a broiler house; no equipment or material is left behind at the farm.

Depending on the type of setter tray used, 50-60,000 eggs per hour can be placed with this machine and the battery has a capacity of up to 250,000 eggs.

The NestBorn machine is compact and easily transportable and can be thoroughly cleaned and disinfected between houses and farms.

NestBorn machine placing 60,000 eggs per hour.

On-farm hatched chicks are not dehydrated and therefore eat before drinking.

This 'traditional' NestBorn egg placing machine has the most optimal profile in conditions where they can place between 300,000 and 500,000 eggs per week. In order to also provide solutions in a context where volumes per operational machine would be less important, NestBorn has developed a compact edition of the machine.

This compact machine has a pace of about 25-30,000 eggs per hour and a battery capacity for 120,000 placed eggs. The length, width and weight of this machine has also been reduced, making it more suitable to load and unload on a truck's tail lift and to transport the NestBorn machine on the same vehicle as the hatching eggs. The high IP67 standard for efficient cleaning and disinfection has obviously been maintained.

A NestBorn Monitoring Platform offers the option to a hatchery to stay involved during the hatching process and to demonstrate its expertise and added-value. At some strategic positions, wireless Ovoscan sensors are positioned in between the hatching eggs and they allow for a remote and real-time view on eggshell temperature and on climatic conditions in the house.

In 2020 more than 100 million NestBorn chicks have hatched and, in total, 10 countries have already had NestBorn experiences in the past two and a half years.

By the end of 2021, 15 NestBorn machines will be operational throughout Europe and the focus is now also turned towards other parts of the world.

Opportunity for a new hatchery design approach

It is perfectly possible for an existing hatchery to combine the production of day-old chicks in a traditional way, with a partial production of day-old chicks according to the NestBorn approach.

The next step toward optimal organisation – and for a capacity increase in an existing hatchery – is to remove some excessive hatchers and to use that vacant space for more setting capacity.

For a hatchery or an integrator in a situation where a new hatchery needs to be designed and constructed, the option of a NestBorn hatchery should be considered.

First of all this would be a future-proof choice, because it would be the sustainable answer to increased societal and customer awareness in terms of early feeding, animal welfare, food safety and reduced utilisation of antibiotics. Secondly, from a chick quality and health point of view, important advantages can be expected if setting of hatching eggs occurs in a context where only eggs are present in the hatchery during the entire process.

The risk of cross-contamination between several batches of chicks would, in this context, also be completely excluded. Furthermore, it is also a sound economical choice

Continued on page 9

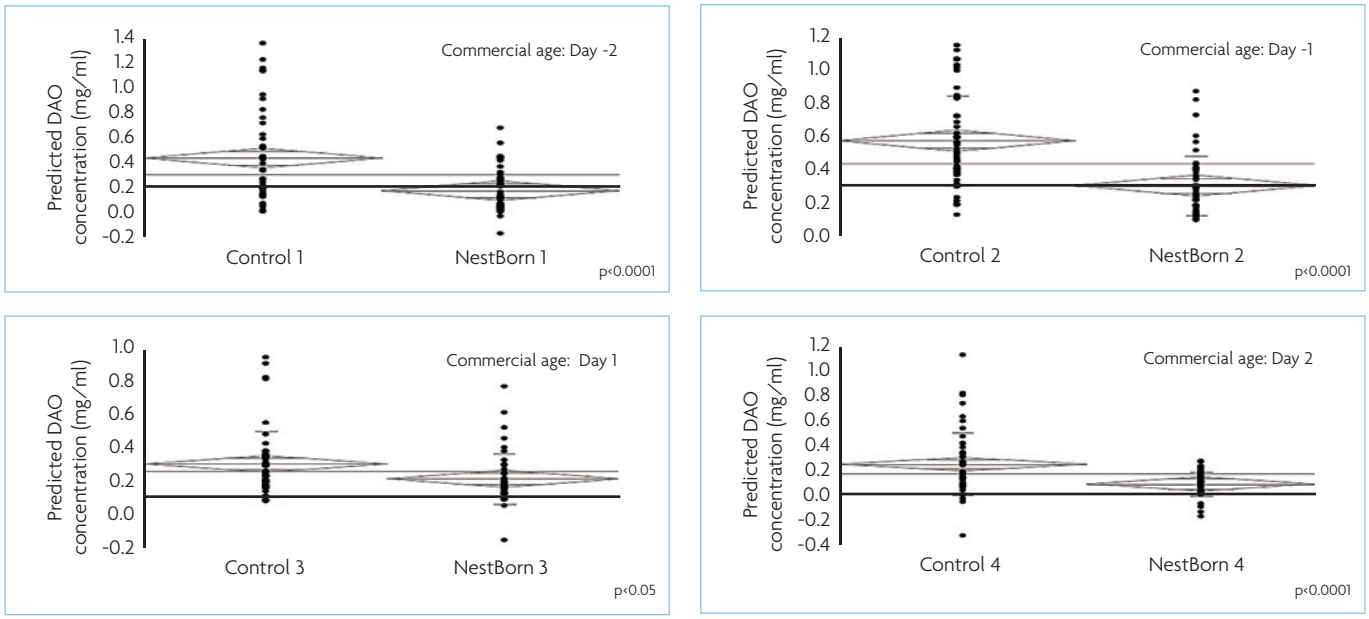

Fig. 1. Lower diamine oxidase (DAO) for NestBorn chicks equals better intestinal health, which equals less antibiotics.

Continued from page 7
because the level of investment in a hatchery that only focuses on setting and candling of hatching eggs can be at least 40% lower. Less land and less hatchery building is required, as no space is needed for hatchers, chick handling automation and chick storage.

Washing and storage of hatching crates and chick transport boxes also becomes redundant. Besides space, at the same time this is a huge saving in hatchery equipment and machinery. The impact on the running costs is also significant as about half of the variable costs (labour, water and electricity) in a hatchery are related to the post-setting phase and would hence disappear. For instance with respect to water (for cleaning), 75% lower utilisation can be realised in a NestBorn hatchery, hence far less wastewater is generated.

The Yellow Bird Group

The Belgian, family-owned, hatchery group Yellow Bird is one of the early adopters of on-farm hatching via NestBorn. In Belgium three broiler hatcheries are part of the group (Belgabroed, Vervaeke-Belavi and L'Œuf d'Or). Hatcheries in The Netherlands (Kuikenbroederij van Hulst) and Germany (Heijmer – van Hulst) are also part of this group. Total production is 4.4 million day-old chicks per week.

In 2020 about 30 million NestBorn chicks were produced by the group. Bart Vermeiren, Director of Belgabroed, states that "by the end of 2022 we want to reach the annual figure of 60 million NestBorn chicks and that would then imply that we will concentrate this production in a dedicated NestBorn hatchery. From that moment onwards we will be able to grasp all hygiene and efficiency advantages of the concept."

Belgabroed is supplying day-old chicks to independent farmers, both in traditional growing systems but also in slow-growing concepts.

"Our annual data shows that – starting from an identical batch of candled hatching eggs – we are able to obtain 1% more high-quality chicks at the end of that key first week," Bart added. "This results in improved hatchability, facilitated by the NestBorn Monitoring Platform, and reduced first week mortality of these more robust chicks".

Today, most of the NestBorn farmers of Belgabroed are situated in The Netherlands, but more and more farmers in Belgium are now adopting on-farm hatching systems because the utilisation of antibiotics – especially in a preventive way – is increasingly coming under fire.

"An economical calculation with farmers based on better feed conversion, lower mortality, less rejects and less veterinary costs demonstrates that farmers can earn more money when they adopt NestBorn," Bart added. "Even when taking into consideration some possible extra heating costs and possibly – but not necessarily – less cycles per year due to the reception of the hatching eggs instead of day-old chicks."

Yellow Bird General Director Carl Destrooper states that "adopting NestBorn has made it easier for us to discuss matters with slaughtering and processing plants. Where traditionally we were able to start growing cycles only four days a week, suddenly with on-farm hatching we can start cycles on an 'every day of the week, every hour of the day' basis. The result is that processors can obtain more desired target weights and the birds are also more even and of better quality; they also appreciate the fact that they have been less exposed to antibiotics and have excellent slaughter yields."

"Last but not least," Carl continues, "slaughtering and processing plants also acknowledge the fact that their own customers also start to embrace the on-farm hatching principle. Because it helps retailers or food service companies to find answers to the increased consumer awareness in terms of animal welfare, food safety and low antibiotics usage in the broiler production chain."

Improved intestinal health

In 2020 a trial was conducted in collaboration with the Laboratory for Host Pathogen Interactions in Livestock of the University of Leuven, Belgium. Traditional hatchery chicks were compared with NestBorn chicks (see Fig. 1).

In order to objectively compare the intestinal development, an enzyme (diamine oxidase, DAO) present in the blood, was used as a marker. This enzyme is released into the blood when intestinal cells are damaged or insufficiently develop. The lower the DAO-values in the blood, the less intestinal damage.

A representative number of blood samples were taken from both groups of chicks on four consecutive days, starting two days before the end of the hatching process.

The NestBorn chicks were sampled during four consecutive days at the farm (Day -2 to Day 2), whilst the traditional chicks were first sampled at hatchery (Day -2 and Day -1) and subsequently at farm (Day 1 and Day 2).

During this entire period, the NestBorn chicks had a significantly lower (= better) DAO-value compared to the traditional chicks. That advantage was maintained even when the traditional chicks received a preventive treatment with Linco-Spectin.

This is an indication that the intestinal development of NestBorn chicks is not only starting sooner, but also that this clear advantage is persisting during the period of the trial. The already demonstrated technical and health advantages of on-farm hatched chicks are hence at least partly due to an early and better intestinal development.

From disruptive to future-proof

At the start of the development of the NestBorn system, the perception was that on-farm hatching and the increased accessibility of such a concept, would be hugely disruptive for the hatcheries and their activities.

But on-farm hatching is now more and more acknowledged as an opportunity for more sustainable broiler production, where advantages for all stakeholders will be obtained in terms of animal welfare (early feeding, stress reduction, less footpad lesions), food safety (less use of antibiotics and less cross-contamination), technical and efficiency improvement (in hatcheries and in broiler farms) and economic gains (up to the level of the slaughterhouse).

The added value of on-farm hatching can lie both in conventional broiler production, but also in concepts based on slower-growing birds, where on-farm hatching can be combined with the other elements used for market differentiation and value creation. ■