In-Ovo Sexing Could Enable On-Farm Hatching for Layers

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In-ovo sexing is a new technology that allows egg producers to sort males and females early in incubation, allowing only females to be hatched. While this technology was initially developed to end the practice of male chick culling, it has the potential to dramatically improve welfare, sustainability and efficiency by unlocking additional technologies, such as on-farm hatching.

Until recently, male and female layers needed to be manually sorted at the hatchery, making on-farm hatching impossible. However, in-ovo sexing makes this post-hatch sorting unnecessary. It's now estimated that 10-20% of the European layer population is sexed in-ovo, with more capacity being added each month. As in-ovo sexing becomes widespread across Europe, some egg producers are now trialing hatching chicks directly in their rearing environment.

Traditionally, fertilized eggs are incubated in setters until day 18, after which they're transferred to separate incubators for hatching. One challenge of this approach is that chicks do not have immediate access to food and water. Moreover, post-hatch processing like sexing, vaccination, and transport can be particularly detrimental for the chicks and labor-intensive for the producer. With on-farm hatching, eggs are transported directly to the farm on day 18.

On-farm hatching has been gaining popularity in the broiler industry due to its advantages in feed efficiency, antibiotic usage, and hatchability, as well as welfare indicators such as footpad dermatitis and stress levels. Scientific studies and large-scale field studies show that broiler chicks hatched on-farm show consistently higher weights throughout their life, which may be due to the fact that the chicks start to feed right away. Because of these benefits, on-farm hatching is now widely used for broilers in Europe and has also been adopted by farms in Canada and Russia.

The company pioneering this approach for layers is Rondeel BV, an egg farm in The Netherlands known for its innovation and emphasis on animal welfare. "We like to do

what's best for the hens, because we believe that the better the hen is growing up and taken care of, the better performance can be expected," said Peter Koelewijn, General Manager at Rondeel BV. Once they moved to on-farm hatching, they observed a 4% increase in hatchability and a lower mortality rate after a viral infection. Koelewijn also noted that his on-farm hatched hens seemed more resilient to intestinal issues and started laying eggs earlier, although he noted that it was too early to tell if they would continue laying eggs for longer than conventionally hatched hens.

Koelewijn emphasized that on-farm hatching is clearly a "more natural and less stressful" start to the chick's life. Chicks hatch in a clean environment with good lighting and without the loud noises associated with the hatchery. They immediately have access to food and water and don't have to go through the stressful experience of transportation to the farm.

Two companies are developing technologies to make on-farm hatching easy for farmers: Vencomatic Group and Nestborn. Freek Leijten, product manager at Vencomatic Group, says that their approaches boil down to a simple question: "what can we do differently to improve the quality of the day-old chicks?" To that end, Vencomatic Group offers two on-farm hatching solutions: Patio and X-Treck. With the Patio solution, platforms are stacked vertically inside the barn on which the chicks hatch and live. Within each platform, egg trays are suspended above the litter bed onto which chicks fall as they hatched. With X-Treck, the system used at Rondeel, the egg trays are suspended from the ceiling, and can be retracted for easy cleaning of the barn. Vencomatic Group also has an in-ovo sexing technology, Genus Focus, which uses MRI to sex eggs non-invasively.

Another company from Belgium called Nestborn offers an on-farm hatching solution that requires no modifications to the facility. With this technology, the hatchery brings a machine to the farm which gently lays eggs on the litter bed on the ground.

Dr. Michael J Toscano, a researcher from the University of Bern's Veterinary Public Health Institute who's studied the effect of the hatching environment on layer performance, expressed caution that there's still a lot we don't know. Unlike broilers, which are typically slaughtered after six weeks, a layer hen needs to stay productive over the course of its entire life. It's therefore much more important to understand the long-term behavioral effects of the new hatching environment.

According to Toscano, hatchery hatching is stressful for the chicks, and "could contribute to a lot of the welfare problems we see, whether it's feather or toe pecking, aggression towards less dominant birds, or other issues." On the other hand, there could be long-term benefits to low-level early life stress, if it better prepares the chicks for

later life. Toscano continued, “Should we apply the silver spoon complex where we shield the animal from all stressors? But then the animal is likely to act adversely when experiencing challenges like the producer walking through the barn to check on animals or the pophole opening. Clearly, we need to find a balance between minimizing stressful experiences and preparing the animal to deal with life’s challenges.”

Despite these areas of uncertainty, Koelewijn is “convinced that this is absolutely the future for laying hens.” Regarding feather pecking, he said “the on-farm hatched hens still have perfect feather cover, which is not always the case.” He also noted some behavioral improvements: “The on-farm hatched hens also divide themselves better over the space available to them, with less chances of smothering and it is more easy for the farmer to walk through the flock.”

As in-ovo sexing becomes more common around the globe, on-farm hatching isn’t the only thing that might grow with it - Koelewijn pointed to in-ovo vaccination as another new possibility for layers. Leijten echoed the idea that in-ovo sexing could enable a host of new beneficial practices: “In the beginning [in-ovo sexing] was more about regulation, the industry had to adapt,” referring to the bans on male chick culling which previously drove adoption of in-ovo sexing in Europe. He continued, “What you see now when you have discussions with the hatchery and the decision makers is that they see the possibilities in-ovo sexing will bring.”