

Efficiency improvement in integrated broiler production

by Peter Schreurs, Director Operations Vencomatic Group China, Asia/Pacific.

Rapidly growing consumption results in higher demands on the resources of the planet. Current predictions estimate that the world population will reach 9.0 billion around 2050. World poultry meat production is predicted to nearly double by 2050 to reach 200 million tonnes. In poultry production a higher demand of resources reflects in increasing costs for land but also for feed, which increased tremendously over recent years.

These changes demand a more efficient and smarter use of resources. How can we increase the number of chicks produced per breeder, and how do we grow more robust broilers? For continuing success we need an integrated way of thinking where we look at the total production chain. Every link in the chain impacts the final outcome of the chain.

In this article we look at the integrated broiler production; from the production of hatching eggs to brooding robust broilers.

Hatching egg production

Perfect hatching eggs are the start of a profitable broiler production. With small gains in egg quality, tremendous improvements can be made in output at the end of the production cycle. But how to improve the quality of the hatching eggs with an efficient use of our resources?

A possible solution is the housing system Veranda breeder, designed by Vencomatic. This multi-tiered group housing system provides the best possible environment for hatching egg collection.

Egg hygiene

Minimising the loss in collecting quality hatching eggs is first of all a matter of preventing floor eggs. A hen has the natural behaviour to look for a safe, clean and sheltered place to lay her eggs.

For successful hatching egg production it is therefore essential to provide a comfortable nest that allows this behaviour. Secondly, it is key to preserve the high quality of the eggs



at lay. Contamination of hatching eggs greatly depresses hatchability and chick quality, which consequently affects profitability in the broiler industry. The Veranda breeder is equipped with the Vencomatic roll away nest. The design of the Vencomat ensures minimum contact with the eggs. With the perfect angle of the nest floor eggs gently roll away directly after lay protecting them from damage by the birds. A tipping floor closing mechanism prevents littering the nest at night and allows dirt and dust to fall off easily when closing the nest.

The system offers an hygienic environment through the combination of the nest and the plastic slatted floor. The open structure of the floor allows manure to fall through keeping a hygienic environment and preventing birds from bringing manure into the nest.

Climate

The well being and nesting behaviour of birds is highly influenced by the climate inside the house. When climate conditions are not up to standard this will be visible in the performance of the flock and the efficiency with which feed is utilised.

The Veranda breeder has an integrated climate system. Large aeration tubes bring fresh air at bird level and onto the manure belt to dry the manure.

This reduces dust and the emission of ammonia to an absolute minimum. Ammonia levels in the Patio are up to 85% lower com-

pared to floor housing. The climate system ensures a constant temperature in the house with an efficient use of energy.

Feed intake

An important factor affecting the performance of a breeder hen is flock uniformity. The most important factor to maintain uniformity in production is to accommodate all birds to have access to feed at the same time. This prevents the birds from crowding at the point where the feed first appears, and prevents uneven consumption which otherwise happens since more aggressive birds will push other birds away.

These features are taken into the development of the feeding lines that are integrated in the Veranda breeder system. The feed consumption is 5-8% lower per hatching egg compared to a floor system.

Labour

As it is getting more difficult to find skilled labour, the importance of an easy to manage system is growing. The Veranda breeder uses vertical space to increase the number of birds for the floor area used. This facilitates a more efficient inspection which is even further enhanced by the use of LED lighting. Possible eggs laid outside the nest do not need to be collected as these will automati-

Continued on page 9



Continued from page 7

cally roll into the nest. This is due to the positioning of the plastic slatted floor.

The system houses birds in groups assuring a uniform distribution of males and females. This reduces stress within the flock and enhances natural fertilisation which makes the labour intensive work of artificial insemination redundant.

Egg collection

Hatching eggs are valuable and should be handled with care, in order to keep the egg shell intact. Damage during collection can be reduced by a high level of accurately adjusted automation and a minimum number of transfers of the eggs.

In the Veranda breeder system eggs that are laid roll directly onto the egg belt that brings the eggs to the egg room. The belt has a unique pattern that consists of square holes which hold the egg and prevent it from further movement.

This ensures minimum contact between the belt and the eggs securing the quality of the eggs.

On-farm egg packing and points down setting direct on setter trays gives an advantage, as this takes out extra transfer of eggs in the hatchery. An accurate points down setting maximises the hatchability of eggs. Each 1% of fertile eggs that are placed points up in a setter tray result in a loss of 0.2% sellable chicks. Manual setting has a points down setting rate of 97%. This is 2.8% lower than the unsurpassed rate of 99.8% which is guaranteed with the use of a Prinzen setter machine.

Brooding robust broilers

From the production of hatching eggs we move on to broiler production. How can we increase the robustness of broilers? The Vencomatic Group have designed a revolutionary system to hatch and house broilers, called Patio. The features of this system improve production, animal welfare and the working environment.

Brooding period

Once the hatching eggs are collected in perfect condition they are commonly incubated for 18 days in incubators, after which they are candled and transferred to the hatcher cabinets for the last three days of incubation. Chicks hatch over a time window of approx-

imately 36-48 hours and are removed from the hatchers only when the majority of the chicks has hatched.

The Patio system takes an alternative route; this system is designed to hatch and house broilers on-farm. Instead of receiving day old chicks, 18 days incubated eggs are now transported from the hatchery to the broiler house. The eggs remain on the setter trays and are transferred into a multi-tiered system.

When a chick hatches, it gently lands on the belt with litter and has direct access to feed and water, while its peers are still hatching. Extensive scientific studies showed this optimal start results in healthy broilers with well developed immune systems, digestive and respiratory systems that are perfectly able to regulate their body temperature.

Climate conditions

The brooding period, which comprises the first few days of the chicks' life, is known to be the most important phase in the production of robust broilers. Broiler breeder companies emphasise how the later performance of the flock is affected by these early life conditions. It is a challenge to achieve an even climate in the broiler house, with the correct temperature and air quality throughout the entire house.

As the broilers grow, the correct climate continues to be a challenge, as the demand for oxygen and removal of carbon dioxide, moisture and ammonia increases. The Patio system is set up in insulated compartments, with two system rows per compartment. Each row consists of six identical levels on top of each other equipped with feed, water and litter.

The rows are separated by a central corridor and two corridors at each other side of the rows. Fresh air is delivered to the outer corridors and is guided through each separate level of the system due to the under pressure that is created with the fans in the central corridor. The climate system achieves a reduction of 50% in heating costs and is entirely controllable by the manager.



The sophisticated climate design distributes fresh air on bird level throughout the entire house, with the right temperature and air speed fitting the birds' needs. It reaches a carbon dioxide level that is 60-70% lower compared to floor houses. This brings more oxygen at bird level which improves the performance of broilers.

Labour

Companies look for efficient tools to maximise the number of chicks that one worker can handle as it is getting more difficult to find skilled workers. The multi-tiers of the Patio system allow inspection at bird level.

This is facilitated by the inspection platform on the side of the system making it a less time consuming operation. In the Patio chicks are grown on a litter belt, which is used to load the chicks and is connected to an automatic harvesting system.

By automating the process of harvesting and loading the chicks, Vencomatic integrate a gentle handling of birds with automatic manure removal. It also eliminates the risk of catchers contaminating the flock. Broilers and manure are separated at the back end of the system. In the Patio there is minimum contact between broilers and farm workers, and labour is kept to a minimum.

Currently over 20 million birds are placed on a Patio. Results show a 1.7% higher hatch of fertile eggs. Broilers housed in the Patio are a day ahead compared to broilers in traditional housing. Hatching on farm combined with an optimal climate in a controlled environment results in 3.6% more first quality chicks with minimum or even without the use of antibiotics.

Summary

This article focuses on efficiency improvement of two important links within the chain of integrated broiler production.

Real improvements can be achieved when companies consider the chain as a whole. An integrated production chain with high efficiency also includes good quality inputs like feed, water and skilled labour. It is then also possible to refrain from the use of antibiotics in broiler production.

The Veranda breeder and Patio systems provide a solid base for efficient production with maximum resource use efficiency to help integrations to get the best possible results. ■