

Integrated approach keeps Salmonella count at zero

Reducing the prevalence of Salmonella in poultry still has global attention. A recent field trial in Europe showed that improved farm management, plus feed and water additives, are proving the perfect combination to minimise Salmonella counts over successive cycles.

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The reduction of Salmonella prevalence is a global focus area for poultry integrators. In addition to the well-known negative effect on end product quality, it might lead to significant negative effects on growth and productivity throughout the flock. For these reasons, it is the goal of integrated poultry producers – and regulatory authorities – to minimise the prevalence of Salmonella from the incubator to the slaughterhouse. After trying different approaches, one European integrator has recently managed to eradicate Salmonella from its poultry, and to keep the Salmonella counts at zero over successive cycles.

Multiple routes to take into account

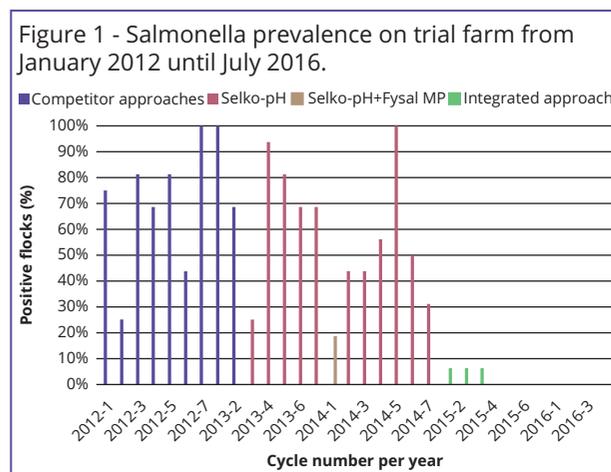
The study which led to this result was carried out between the start of 2012 and the end of 2015 at the integrator's 16 broiler houses. This farm had faced a high incidence of *Salmonella infantis* since 2009, with 25% to 100% of flocks testing positive each cycle. There are many possible points of contact for the

animals via feed, and in several production phases via contact between birds. Salmonella can also easily be transferred from one house to the next, for example from the clothing of people who pass between them. Finally, rodents, wild birds and insects can also carry Salmonella and spread it throughout the farm. The goal was to reduce the number of Salmonella-positive flocks to zero and to maintain that status over a period of time. After trying out several different strategies (acids, probiotics, and severe cleaning), the company started using a functional water additive from the third cycle of 2013 onwards. The product used was Selko-pH, a synergistic blend of free and buffered organic acids that reduces the pH of drinking water, supports digestion and improves the microbial balance in the gastrointestinal tract. Although the Salmonella incidence initially decreased, using a single additive alone was not enough. During the first cycle of 2014, a second product was added to the strategy (Selko Fysal MP). This resulted in a reduction in the number of Salmonella-positive flocks to 19%, compared to 69% of the flocks in the previous cycle. After that, the strategy returned to only using the water additive, resulting again in a far higher incidence of Salmonella-positive flocks (Figure 1).

Audit reveals the need for an integrated approach

By this stage, it was clear that a more comprehensive strategy was required. A complete audit was performed in order to gain a clear overview of the situation. The results suggested that an integrated approach should be introduced; and it was shown that Salmonella can be effectively reduced when hygiene and management measures are taken, in combination with a feed additive programme. This consisted of using a functional additive (Selko Fysal Fit-4) in the birds' feed, plus another product to reduce Salmonella presence in the feed, in combination with the two previous products. This integrated strategy addresses Salmonella in four ways:

- by reducing Salmonella in feed and raw materials,
- by reducing attachment to intestinal cells,
- by likely stimulating the growth of commensal bacteria in the gut, and
- by supporting natural mechanisms that reduce colonisation of the gut.





The fourth product (Selko Fysal SP) is very effective in feed residues in the feed production line, and so in reducing recontamination of feed. Crucially, this additive programme was combined with an improved hygiene and management protocol for treating feed, water and the birds' environment, and training staff in hygienic farm management, as shown in *Table 1*.

Consistently successful results

This integrated approach was used during the first three cycles of 2015, resulting in just one positive flock per cycle. However, in every cycle, Salmonella was still found in one of three houses in the farm area which was closest to a source of external contamination. Therefore, before the start of the fourth cycle of 2015, an extra Salmonella audit of these three houses and their surroundings was conducted. The surroundings were found to be Salmonella-positive, so extra hygiene measures were taken to prevent the bacteria from the environment from entering the houses. After this, all flocks tested negative for Salmonella and they have stayed negative up until the last measurement in the fourth cycle in 2016.

As shown in this field study, company-specific characteristics will have an effect on the specific strategy used to reduce Salmonella. Putting knowledge into practice means offering the most effective solution for each individual situation. Due to the multi-factorial nature of the problem, Salmonella reduction definitely involves teamwork. These results prove that an integrated approach of applying functional feed products combined with farm and hygiene management is very successful in reducing the prevalence level to zero. Feed and water additives can exert their effects best when applied in different produc-

tion phases. This is due to their different modes of action, as products that reduce Salmonella in the feed work differently to additives that support the animals' performance.

Lessons learned over time

The effect of hygiene measures cannot be underestimated. It's important to include hygiene measures in the housing system, since Salmonella can easily be transmitted from one house to the next. To avoid this, boots and overalls should be changed or cleaned without fail. In our industry, all players are part of a safe food production system, and it's in everyone's interest to achieve this, so proper training is vital. In addition to products that reduce the bacterial load in feed, good hygiene and management are therefore part of successful Salmonella reduction programmes. Performing audits has also proven to be of crucial importance in the elimination process. By implementing all of these points in a five-step process, the integrator in this case has been able to maintain the incidence of Salmonella at zero for seven cycles.

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Table 1 – The 5 steps of the integrated approach.

Goal	Execution
1 Gain insight into the causes of the problem	Perform the Selko Salmonella Audit at site
2 Advise a specific programme	Use of specialist products to reduce Salmonella
3 Offer hygiene and management advice	Train the integrator's farm and other staff
4 Evaluate the effects	Perform a re-audit
5 Create a financial benefit for the customer	Rationalise total feed additive use and improve performance