

Comprehensive food safety program for better salmonella control

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Producers facing increased pressure to reduce salmonella in their poultry flocks can comply by implementing a comprehensive salmonella control program that ultimately will benefit consumers, themselves and the entire poultry industry.

Despite past control efforts, salmonella remains a leading cause of food poisoning in people. In the European Union (EU), salmonella was the most commonly reported cause of foodborne outbreaks in 2007, according to The European Food Safety Authority and the European Centre for Disease Prevention and Control. Eggs and products containing eggs were the foods most often involved.

In the United States, an estimated 40,000 cases of salmonellosis in people are reported annually. Although salmonella can occur in a wide variety of food products, poultry is a main reservoir for the pathogen, according to the US Centers for Disease Control.

The most prominent salmonella serotypes where food safety is concerned are *Salmonella enteritidis* and *Salmonella typhimurium*, although the EU now also considers *Salmonella hadar*, *Salmonella virchow* and *Salmonella infantis* to be the main salmonella serotypes.

EU leads effort

The leader of efforts to reduce the incidence of human salmonellosis is the EU, where the Commission of the European Communities recently announced an ambitious plan. By the end of 2009, a maximum of 1% of adult breeding flocks would be infected by one of the main serotypes. In 2007, 1.2% or less of breeding flocks were positive for one of the main serotypes, but five member states had an incidence between 4.2% and 15.4%.

In broilers, the EU's goal is to have 1% or fewer of flocks positive for *S. enteritidis* and *S. typhimurium*; an average of 23.7% of broiler flocks were positive for all salmonella

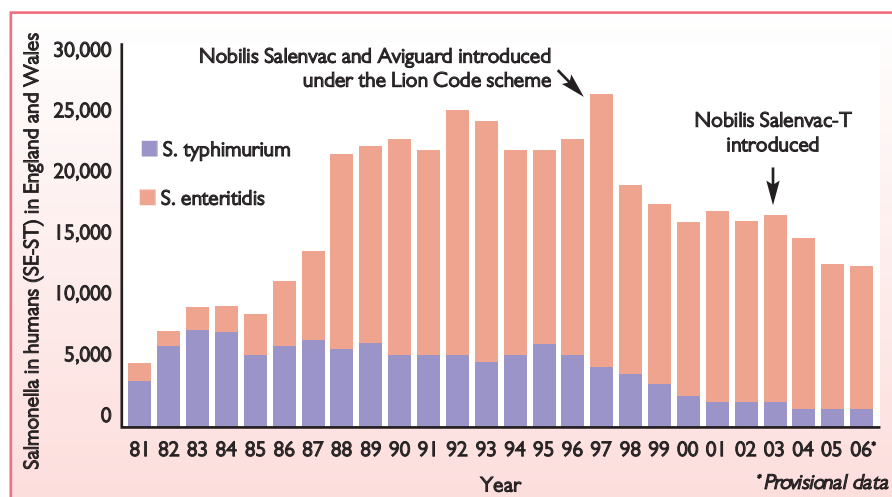


Fig. 1. In the UK, the introduction of an inactivated salmonella vaccine contributed to a significant drop in human salmonella cases.

types in a 2005-2006 study. The ultimate target for layers is under 2% positive for *S. enteritidis* and *S. typhimurium*; a baseline study in 2004-2005 showed that the incidence of positive layer flocks ranged from 0% to over 50%.

The Commission also plans to adopt detailed rules on salmonella food safety criterion for fresh poultry meat before the end of this year, which will include minimum sampling frequencies, harmonised sampling plans and analytical methods. Individual countries where salmonella control is intensifying include Japan, Brazil and Thailand. In the United States, new standards for turkeys and poultry will be developed by the end of the year as well as a salmonella verification program for poultry companies.

Control strategy

There is no question that poultry producers in all segments of the industry will need to sharpen their salmonella control efforts, but experience in the EU has demonstrated that it is possible to reduce the incidence of salmonella in poultry and people with a dedicated action plan. The plan must be comprehensive, however, and the pillars of the plan need to be monitoring, biosecurity, management, vaccination and the use of

competitive exclusion. Monitoring is necessary to determine the salmonella status of farms, integrators and countries. It can target areas of the production chain where salmonella control is needed, direct the development of a control program and help evaluate the status and efficacy of the program.

Although salmonella can be transmitted vertically from chicken to progeny and horizontally from chicken to chicken, it can also be contracted from numerous outside sources such as people, rodents, wild birds, water, feed, dogs and insects. This is why biosecurity and management are crucial to any salmonella control program.

Poultry houses need to be built properly to protect birds from outside salmonella sources; preferably, farms should be enclosed within a fence. Rodents, wild birds and insects need to be controlled. Showers, clean clothing and boots should be provided to visitors and workers on the farm. Food and water should be routinely checked for salmonella contamination as well as new chicks to the farm. Single-age farms can further help control salmonella.

Vaccination plays a key role in any salmonella control program for poultry. Live vaccines induce active immunity in birds, protecting them from salmonella infection,

Continued on page 17

Continued from page 15

but killed vaccines do more: they protect vaccinated birds as well as induce high antibody titers that are passed on to progeny as maternally derived antibodies (passive immunity) via the egg. Research has shown that broilers from hens vaccinated with Nobilis Salenvac, an inactivated salmonella vaccine, are protected against *S. enteritidis* for at least 21 days.

UK experience

In 1998, the UK egg industry implemented the Lion Code scheme, which was aimed at improving biosecurity and carrying out mon-

itoring and vaccination of layers. Nobilis Salenvac was the first salmonella poultry vaccine to be used in the UK.

Around the same time, Aviguard, a competitive exclusion product, was also introduced. Following the new Lion Code scheme and vaccination with Nobilis Salenvac, there was a significant drop in human salmonella cases.

A further drop was achieved after the introduction of Nobilis Salenvac-T, an inactivated vaccine that protects against *S. enteritidis* and *S. typhimurium* (Fig. 1).

Vaccination is serogroup-specific. In other words, a vaccine for *S. enteritidis* will not protect against salmonellas from another salmonella serogroup. A vaccine for *S.*

enteritidis will not protect against *S. typhimurium*. However, challenge trials with birds vaccinated with Nobilis Salenvac-T have demonstrated cross protection within the serogroup.

For example, *S. typhimurium* belongs to Group B and Nobilis Salenvac-T controls other Group B serotypes such as *Salmonella agona* and *Salmonella heidelberg*.

Competitive exclusion products such as Aviguard can provide an additional tool for control of salmonella. Aviguard contains more than 200 different types of the normal intestinal bacteria found in healthy adult chickens.

It helps prevent the colonisation of transient pathogenic bacteria, including all types of salmonella. Studies have shown that adding Aviguard to a salmonella control program can boost salmonella control.

Other measures that can be employed to control salmonella may include the use of disinfectants, culling infected birds and the use of litter treatment products that discourage salmonella growth.

Food safety concept

Help for developing a salmonella control program is available to poultry producers. In Brazil, for instance, the Intervet/Schering-Plough Animal Health team has put together a comprehensive Food Safety Program.

The team helps with monitoring to identify where salmonella is present in the production chain, then works with producers to develop an individualised salmonella control plan.

Vaccination and other tools such as competitive exclusion, disinfectant and litter treatment are part of the program.



It is clear that the industry needs to take salmonella control seriously and that there is no 'magic bullet' for salmonella control. However, with proper monitoring and a dedicated action plan, control of salmonella can be achieved in both poultry meat and eggs.

A solid salmonella control program is an investment, but poultry producers ultimately will benefit because it will reduce the incidence of human food poisoning and increase consumer confidence in safe poultry meat and eggs. Salmonella control will also help countries safeguard the export of poultry meat and eggs. ■