



# Livestock Knowledge Transfer

a DEFRA initiative

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## FOOD SAFETY: MINIMISING THE RISK OF SALMONELLA IN BROILERS

*Salmonella* is a major group (genus) of enteric bacteria, members of which can colonise the intestinal tract of all animals including man. *Salmonella* can also be found in the general environment as a result of dissemination of faecal contamination from sewage, wastes from farms and allied industries and wildlife. Contaminated food waste may also act as a source of infection for wildlife. Most *Salmonella* strains can survive for long periods in water and in dry materials such as dust and feedingstuffs. Low numbers of organisms surviving in the environment in a dormant or semi-dormant state can multiply rapidly if suitable warmth, moisture and nutrients become present.

If a virulent strain of *Salmonella* becomes established at the top of an animal breeding pyramid it can rapidly be disseminated to multiplier and parent herds or flocks and then onwards into the commercial generations of livestock. This is thought to be the mechanism by which *S. enteritidis* PT4 spread so rapidly in the 1980s and early 1990s. Spread of *S. enteritidis* was further enhanced by the unusual ability of the organism to persist in the ovary and oviduct and thereby contaminate the interior of hatching eggs. Now that *S. enteritidis* is uncommon the main sources of other *Salmonella* serotypes are contamination in the feed mill or hatchery, which may also become farm-resident if terminal cleaning and disinfection or rodent control is ineffective.

### CONTROL OF SALMONELLA ON FARM

- Ensure that broiler chicks coming onto farm are from parent flocks and hatcheries that are free from *Salmonella*
- Ensure that feed and feed delivery lorries are free from *Salmonella*
- Maintain a good pest control strategy as mice, rats and wild birds can carry *Salmonella* and contaminate clean buildings and feeding systems
- Ensure thorough and effective cleaning and disinfection of housing, equipment and ancillary areas at the end of each crop
- Provide and use separate dedicated footwear and protective clothing for each house or an effective disinfectant footbath at the entry to each house
- Maintain feed silos and feed delivery systems in good, clean condition to prevent a build up of contamination or access by farm pests
- Ensure that water supply is clean, and at the end of each crop flush out water tanks and pipes with an effective sanitiser to remove the thin layer of contaminated organic matter (biofilm) that can harbour *Salmonella* and other bacteria
- Maintain a well managed waste disposal routine. Litter and effluents such as wash water attract vermin and wild birds which may be (or become) infected with *Salmonella*
- Maintain strict personal hygiene standards; humans can carry *Salmonella* and may possibly infect a clean flock

## OTHER CONTROL MEASURES

- Heat or acid treatment of feeds at the mill is frequently used in order to reduce bacterial contamination
- Use the most appropriate vaccination regime for broiler parent flocks for your situation, as recommended by your vet
- Competitive exclusion products may help to reduce the risk of chicks becoming infected on problem farms
- Discourage visitors from entering your site, as every visitor, vehicle or item of equipment is a potential *Salmonella* carrier
- Routine microbiological monitoring is useful to help schedule slaughter and to measure the effectiveness of cleaning. Serotyping *Salmonella* isolates is useful for tracking back and identifying sources of contamination

## POTENTIAL PROBLEMS AFFECTING GOOD SALMONELLA CONTROL

- Pressures to increase throughput by reducing turn-round time have made implementation of good hygiene practice more difficult, especially on large sites
- The standard of cleaning and disinfection is variable and may deteriorate towards the rear end of houses or in houses cleaned last on large multi-house sites
- Some disinfectants in current use are not as effective as others
- Thorough cleaning and disinfection of transport crates and equipment/clothing used by cleaning gangs can prove difficult
- The quality of hygiene precautions taken by contract cleaners, catchers and thinners can be variable and can sometimes create difficulties
- Some feedmills and hatcheries are subject to intermittent or persistent contamination in pellet cooling systems or ventilation ducting of incubators

## THE FUTURE

Although *S. enteritidis* in poultry appears to be falling rapidly it will never be possible to relax control measures, and other serotypes, including *S. typhimurium*, are still present in broiler production. There will always be potential new sources of infection originating from contamination by sewage waste or imported material. *S. enteritidis* can persist in dry dusty places for several years so may be dislodged from inaccessible areas in buildings during repairs. Any monitoring scheme can offer only a certain level of sensitivity for detection of the target organism and it is possible that *S. enteritidis* in some vaccinated parent flocks may have been suppressed to levels below the limits of detection of current monitoring tests. It is also important to have sufficient surveillance in place to rapidly identify future epidemic strains of *Salmonella* and assess their significance. Molecular genetic techniques for 'fingerprinting' strains which appear to be spreading and assessing their potential for virulence in animals and humans, will therefore be essential tools for the future.

## MORE INFORMATION



Andrew Walker (ADAS Gleadthorpe) 01623 844331.

For a full list of available factsheets contact Deborah Courtney 01970 823 028 or email [kt@bbsrc.ac.uk](mailto:kt@bbsrc.ac.uk)



[andrew.walker@adas.co.uk](mailto:andrew.walker@adas.co.uk)  
[www.agriknowledge.co.uk](http://www.agriknowledge.co.uk)