

During the seminar programme at VIV Asia in March this year, **Dr GOOSSEN VAN DEN BOSCH*** presented a range of options for the management of Salmonella. With experience as a senior poultry health specialist for over thirty years, Dr. van den Bosch owned and ran his own large-scale poultry operation in the Netherlands until 1990, when he joined the Veterinary Services Department of Intervet International to provide technical support for the company's poultry customers - particularly in Europe and the Far East.

Vaccination versus treatment: How Europe is tackling the eradication of Salmonella

Since the mid 1980's, S. enteritidis has emerged worldwide as the most common form of Salmonella isolated from poultry. At the same time, public awareness of the health risks associated with food-borne pathogens has never been greater - so it is no surprise that the major food retailers have been central to lobbying for change to safeguard public health, as well as their reputations.

However, as globalisation continues to impact on the commercial and industrial sectors, so the efficiency of Salmonella management in poultry production comes increasingly under the microscope.

In Europe, major food retailers like Tesco and Marks and Spencer have had an enormous impact on the shape of European food safety standards and legislation, where the whole chicken pyramid must be clean. These retailers continue to lobby to prevent the use of antibacterial growth promoters, animal proteins and animal fats in food products for human consumption. Their voice is part of a growing international trend to reduce treatment by antibiotics, in favour of a preventative strategy that puts vaccination at the core of an integrated approach to

maintaining a clean, healthy food chain.

The severity of Salmonella in humans varies, but it can be fatal for immune compromised individuals, the elderly or the very young - and in 1992, against the backdrop of increasing reports of Salmonella infection in humans, a new European Directive, the Zoonosis Directive (EC/92/117), was enforced to minimise contamination in layers and breeders.

This Zoonosis Directive laid down rules for the extensive monitoring of flocks and antimicrobial resistance, together with setting targets for the reduction of zoonoses and crucially, the adoption of relevant control measures.

However in 1999 alone, there were as many as 166,000 official reports of human Salmonella infection in European countries - and the actual number of unconfirmed cases is likely to be even higher.

The number of officially reported cases dropped to 150,000 by 2000, and targets have now been recommended for both S. typhimurium and S. enteritidis to be reduced to five per cent in layer flocks by December 2006, with all Salmonella serotypes to be reduced to 10 per cent in broiler flocks in

the same period. Subsequently both targets are revised to one per cent and two per cent respectively by December 2011. These targets are yet to be approved and fully adopted.

In the meantime, the European poultry producing sector has been proactive in its adoption of control strategies, to deliver Salmonella-free poultry products for human consumption.

European strategies for the control of Salmonella

The Zoonosis Directive acknowledged the need for comprehensive controls, recognising the importance of combining measures to create an effective, protective barrier between poultry flocks and the outside world. Effective biosecurity is a business critical function in commercial poultry operation in Europe - and as such, preventing any breach of this barrier, for example via drinking water, feed and litter (where provided), or the prevention of contamination by rodents, wild birds or even human handlers, is fundamental to achieving optimum results and meeting Directive targets.

Different countries have, however, adopted differing strategies to

Salmonella control - with varying levels of success.

In Scandinavia, where the emphasis is on control by biosecurity without vaccination, combined with extensive flock monitoring, the incidence of Salmonella outbreaks in broilers is almost non-existent, reducing from 40+ outbreaks annually between 1969 and 1982 to less than five outbreaks up to 2000. However reported cases of human Salmonella have failed to reduce significantly.

In Germany, the vaccination of all laying hens is compulsory, and broiler breeders are almost 100 per cent vaccinated. Routine testing of broilers takes place at two weeks prior to slaughter - although there is no compulsory monitoring system. However of total Salmonella infections reported in Germany, S. Typhimurium has started to emerge more prominently in recent years.

In 1997, The Netherlands' three-year 'Action Plan Salmonella' was introduced, with the aim of reducing the incidence of positive testing for S. enteritidis and S. typhimurium to less than five per cent of national flocks. The Netherlands favoured a more integrated strategy, placing considerable emphasis on flock monitoring in combination with the adoption of clear hygiene and management controls, changing room facilities and rodent control plans.

Processes were engineered so that positive testing triggered an official disinfection programme - yet monitoring during the period 1997 to 2001 revealed only limited and somewhat inconsistent success in reducing Salmonella in rearing and laying flocks.

This first phase did, however, provide a useful benchmark against which to measure the success of the second phase. 'Action Plan Plus', which has been in effect since 2001.

Stringent controls combined with the risk of incurring considerable costs if a flock tests positive, have encouraged many farmers to turn to vaccination as a more cost-effective alternative - and last year alone, over 80 per cent of laying flocks were vaccinated as a preventative measure, with the

result that during the third quarter 2002, only one per cent of poultry meat tested positive for S. enteritidis or S. typhimurium. Over half of those infections were caused by S. paratyphi java.

Nowhere though, is the success of an integrated strategy more evident than in the United Kingdom, where in 1988 a single statement by a then junior health minister caused the virtual collapse of the egg producing sector.

Edwina Currie's statement, that 'most of our [UK] egg production is infected with Salmonella' prompted an unprecedented boycott of eggs and egg products by British consumers, and it was ten years before the industry put its house in order and engineered the very public launch of the now industry standard 'Lion Code of Practice'.



This new charter highlighted traceability and registration, combined with specific Salmonella vaccination; hygiene, time and temperature controls; the adoption

of best before date stamping on both packaging and individual shells - and crucially, to boost public confidence still further, a programme of independent auditing.

Traceability was - and still is - applied to hens, eggs and feed, and a 'passport' accompanies pullets from the rearing farm to their egg-producing destination.

Full vaccination of the Lion flock - 1.9 million pullets per month at a cost of US\$6.7 million per annum for vaccines and administration - was in place within a year of launching the Lion Code, and on-farm hygiene controls combined with effective rodent control became mandatory.

These stringent measures extended even to the Feed Mills, where 'Lion' approval requires guarantees that no mammalian or avian products are in use, and no tainting of raw materials is permitted. Transportation and packing centres must also adhere to strict measures governing temperature controls, traceability, crack and blood detection and cleaning schedules.

Vaccination, in conjunction with comprehensive biosecurity measures, has proved to be a powerful and convincing antidote for what was probably the first and most public poultry-related health scare in the UK. Shell egg consumption is rising for the first time in thirty years - and while Edwina Currie has long ago moved

Salmonella in broilers in England & Wales.



Data for other serotypes not available for years 1989-1992.

on, her legacy remains with British consumers, who are more discerning and more vocal than ever before about the quality of the food they eat.

Make no mistake, the incidence of human Salmonella infection is a powerful motivator for Legislators throughout Europe, who are listening to the major retailers because they clearly reflect consumer concerns.

As a world leading authority in animal health, Intervet International B.V. has worked hard to consolidate its reputation as a problem solver for the poultry industry. The company's product development strategy is to find and refine solutions by active research - and its Salmonella vaccines Nobilis Salenvac and Nobilis SG9R have emerged as world-class products that promote confidence by results. Notably, Nobilis Salenvac was introduced in the UK in 1993, and produced an immediate and verifiable reduction in the incidence of Salmonella in Livestock production.

Intervet has created several tools to help poultry producers meet the challenge of Salmonella each designed to manage the challenge in each segment of poultry production.

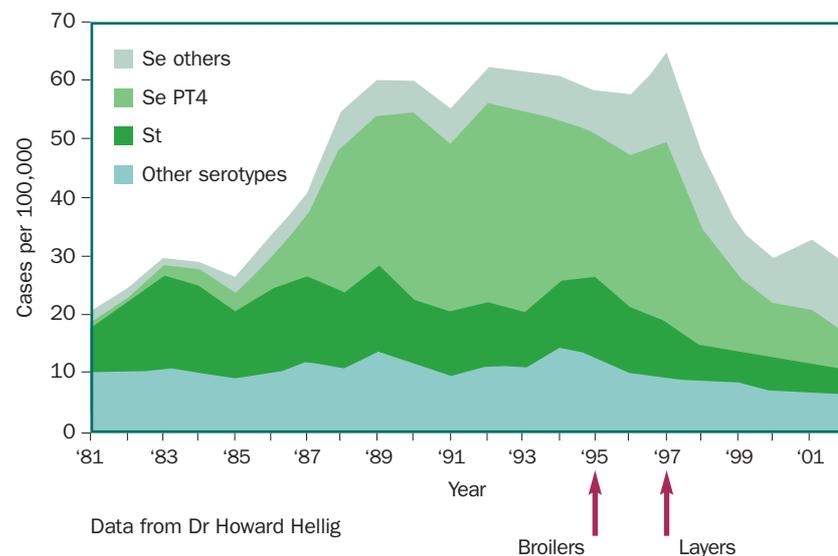
As well as Intervet's established SG9R and Salenvac vaccines, our next generation Salmonella vaccine Salenvac T now extends the range to provide effective, combined protection against both S.

Salmonella in retail chicken in England & Wales.

Salmonellae	Frozen	Chilled	Total
1979/80			
All	79/100 (79%)	Not examined	79/100 (79%)
S.e.	0/100		0/100
1987			
All	65/101 (64%)	56/103 (54%)	121/204 (59%)
S.e.	20/101 (20%)	10/103 (10%)	32/204 (16%)
1990			
All	79/146 (54%)	62/146 (42%)	141/292 (48%)
S.e.	33/146 (23%)	28/146 (19%)	61/292 (21%)
FSA			
2001 local			c. 2,5000 tested
All			c. 5.8%
S.e.			c. 0.15%

Data from Dr Howard Hellig

Salmonella in humans in England & Wales.

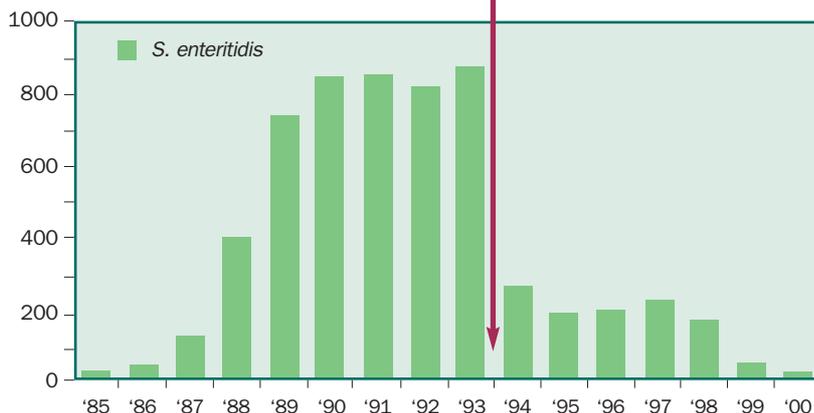


Experience with Salenvac in UK.

Ref: Salmonella in livestock production, MAFF

Salmonella incidents, poultry breeding flocks and hatcheries order 1999.

Salenvac introduction



typhimurium and S. enteritidis. Salenvac T was introduced in the UK Jan 2003, and will be available worldwide from 2004.

Intervet's vaccine development strategy is to deliver effective reduction in the shedding of Salmonella, thus preventing cross-contamination anywhere in the production chain. We are strongly committed to the adoption of a comprehensive prevention programme alongside the use of vaccines that focuses producers on the need for high standards of bio-security. ■

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