

Duration of Immunity from Vaxsafe® ST in Layers

Practical Protection against Salmonella for the Egg Industry

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The Problem

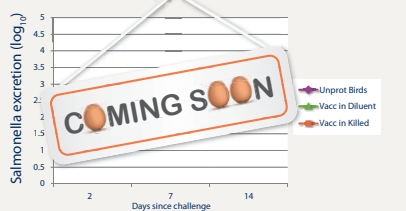
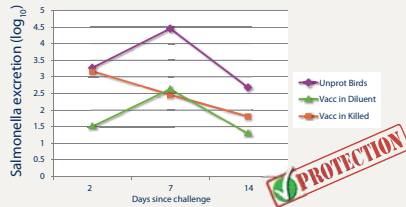
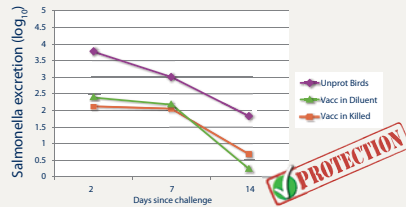
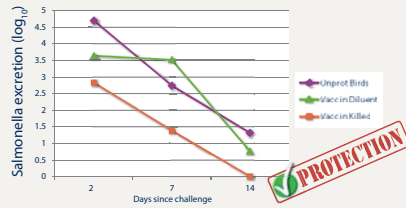
Salmonella contamination of eggs is considered an important public health problem. Increasing the resistance of hens to infection with Salmonella would help decrease contamination of table eggs with Salmonella.

To date the problems have been how to get long lasting protection and broad (heterologous) protection. Vaxsafe® ST is a live *aroA* deletion mutant vaccine that can decrease ST shedding and colonisation when given orally but the duration of immunity is probably limited to around 6 weeks.

The Poultry CRC, established and supported under the Australian Government's Cooperative Research Centres program, has funded this research looking at whether long term protection could be given for the laying period of hens by injecting the vaccine as part of pullet vaccination.

Experimental Design			
Group ID	Vaxsafe® ST (10 ⁷ CFU) priming	Group	Comment
Unprot Birds	None	Unprotected	Positive control for Salmonella challenge
Vacc in Diluent	Spray at day old & in water at 2 & 6 weeks	Vaxsafe® ST vaccine (10 ⁷ CFU) in Mareks diluent injected (IM) at 10 weeks	Experimental
Vacc in Killed	Spray at day old & in water at 2 & 6 weeks	Vaxsafe® ST vaccine (10 ⁷ CFU) in EDS/NDV Killed vaccine injected (IM) at 10 weeks	Experimental

Homologous Challenge (10⁹ CFU wild *S. Typhimurium*)



PROTECTION: Specific

RESULTS

Weeks since experimental vaccination

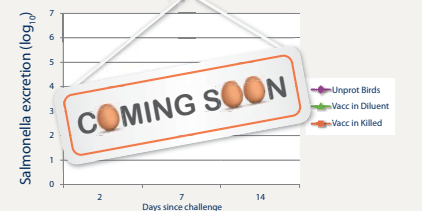
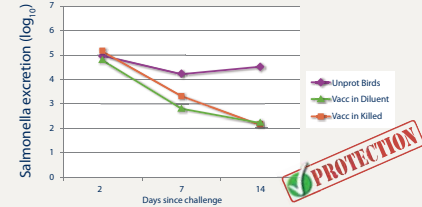
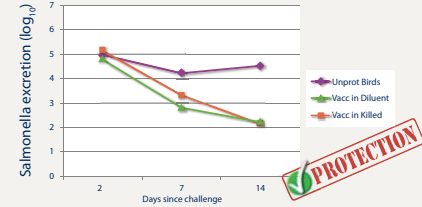
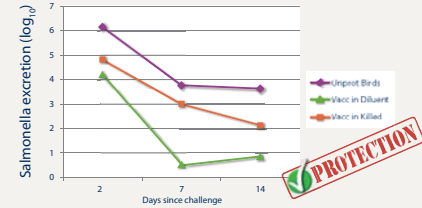
6 weeks

20 weeks

35 weeks

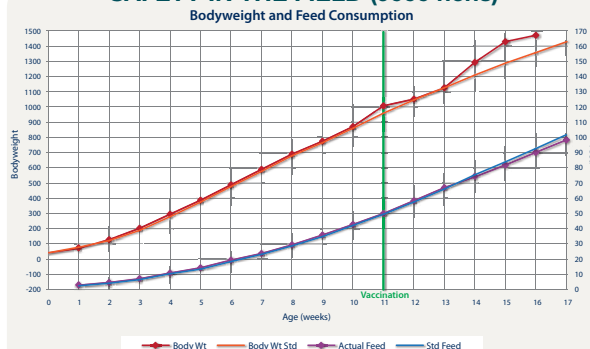
50 weeks

Heterologous Challenge (10⁹ CFU wild *S. Infantis*)



PROTECTION: Broader than achieved from Killed vaccines

SAFETY IN THE FIELD (9000 hens)



No adverse effects were seen in the short or long term in a flock vaccinated with Vaxsafe® ST injection in NDV and EDS Killed vaccine and the serological responses to NDV and EDS at 14 weeks were unaffected compared to a sister flock.

Conclusion

Long lived protection (so far 35 weeks post vaccination) and heterologous protection to massive laboratory challenges has been demonstrated by a vaccination regime including Vaxsafe® ST injection. Demonstration that reduced excretion can be achieved with mixing into a killed vaccine that is currently used, makes this intervention cost effective. The effect seems to be by decreasing the ability of the challenge strain to initially establish in the birds making its clearance faster. In the field this can be expected to decrease egg contamination. Further in the field we have demonstrated that the injection method is safe. Biosecurity is still needed to minimise the challenge but better protection can be expected.

Reference
Arnold ME, Gosling RJ, La Ragione RM, Davies RH, & Martelli F. (2014) Estimation of the impact of vaccination on faecal shedding and organ and egg contamination for Salmonella Enteritidis, Salmonella Typhimurium and monophasic Salmonella Typhimurium. Avian Pathol. 43:155-63.

What next?
You talk to your vet!
We'll explore extension of our registration!

