



On-Farm *Salmonella* Control Measures for
Layers

Vaccination



Why Vaccinate?

- To help reduce *Salmonella* infections in individual chickens
- To help reduce the number of positive flocks
- To help reduce the amount of *Salmonella* shed into the environment
- To help reduce contamination of eggs
 - Shell contamination
 - Vertical transmission

Why Vaccinate Layers Against *Salmonella enteritidis* (SE)?

- To reduce risk of human *S. enteritidis* (SE) outbreaks
- To help reduce risk of SE colonization of the hen's internal organs, including the reproductive tract and intestines, hence becoming an integral part of an SE control program
- To protect brands and industry image
- To protect company and stock value
- To help reduce the risk of losses associated with diversion of eggs to breaking plants
- To help reduce potential of SE growth in eggs
 - SE bacterin use results in antibodies in yolk¹

Modified-live *Salmonella typhimurium* (ST) Vaccines

- *Salmonella typhimurium* (ST) used for modified-live vaccines
- ST vaccines can help provide significant cross-protection against SE, *S. hader*, *S. heidelberg* and *S. kentucky*²
- Mass Mass application – water or spray
- Early stimulation of immunity
- Minimal post-vaccination stress on birds

Target System Of *Salmonella* spp. Is Gastrointestinal (GI) Tract



Water and spray vaccination helps target GI route for optimum local immunity

Modified-live ST Vaccines – Spray Administration

- Coarse spray helps ensure vaccine reaches GI tract
- Spray particle size should be at least 150 microns
- Coarse-sized droplets
 - Less inhalation and more coverage on feathers
 - Slower evaporation allows more time for preening
- Lights on during and after vaccination encourages preening
- Exhaust fans off during vaccination, when possible

SE Bacterins

- Bacterins contain inactivated (killed) bacteria
- SE Bacterins contain various phage types
- Phage types vary in pathogenicity

SE Bacterins

- Stimulate production of circulating SE antibodies
- More effective in turning positive environment negative³

SE Bacterins



- Bacterins are water-in-oil mixtures (antigen:adjuvant)
- Adjuvant stimulates strong immune response
- Strong response may slow pullet rate-of-gain and delay onset of lay

SE Bacterins

- Prewarm bacterin to ~85° F (29° C) prior to injection to minimize vaccine reactions
- Not all bacterins are equally reactive
- While most are given under skin, some are mild enough to be injected into muscle

SE Bacterins: Antibody Response

- Bacterins stimulate an antibody response
- Circulating antibodies can be measured in laboratory





**Vaccination should be an
integral part of a *Salmonella*
control program to provide you
with confidence and added value**

References

1. Holt PS, Stone HD, Gast RK, Porter RE, Jr. Growth of *Salmonella enteritidis* in egg contents from hens vaccinated with an SE bacterin *Food Microbiology* 1996;13:417-426
2. Data on file, Study Report Nos. TIA#20061, TIA#22497, B-393-01-Phase 4 A&B, Zoetis Inc.
3. Gast RK, Stone HD, Holt PS. Evaluation of the Efficacy of Oil-Emulsion Bacterins for Reducing Fecal Shedding of *Salmonella enteritidis* by Laying Hens. *Avian Diseases* 1993;37:1085-1091.