



SALMONELLA SPP. NEW SOLUTIONS TO ONGOING PROBLEMS

With more than 2,000 known strains⁵, Salmonella continues to threaten the health of dairy cattle and the profitability of dairymen. The incidence of Salmonella infection continues to rise, with the percentage of cows testing positive via fecal culture more than doubling over an 11-year period from 5.4 percent in 1996 to 13.7 percent in 2007. The number of dairies testing positive for Salmonella infection also nearly doubled in that time frame, from 21.1 percent to 39.7 percent⁷. Another study found Salmonella to be present in 18.1 percent of diarrheic calves¹.

INFECTION WITH SALMONELLA CAN BE FATAL TO CATTLE. COMMON CLINICAL SIGNS INCLUDE:

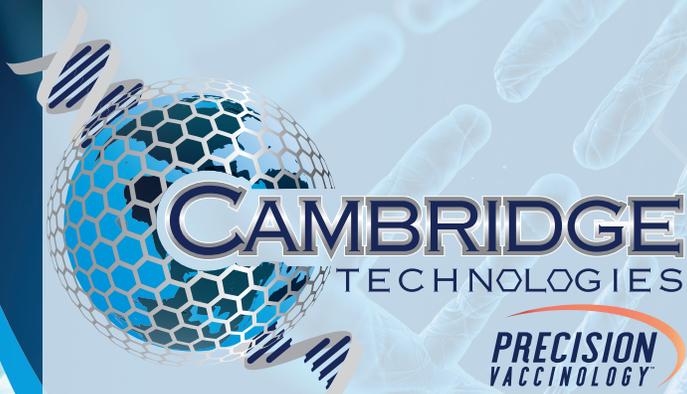
- Fever
- Diarrhea
- Anorexia
- Abortion
- Decreased milk production⁶
- Rapid dehydration and death of calves⁵

There are a number of strains of Salmonella that can affect cattle, with the most common including *S. anatum*, dublin, montevideo, newport and typhimurium. Modern literature classifies these into a single species, *Salmonella enterica*, with subclassification by the traditional serovar name². There are many other strains that do not produce clinical disease in animals, but colonize in the gut, eventually entering the human food chain and causing food poisoning³.

There is evidence that Salmonella can be spread vertically from dam to fetus, causing calves to be born infected⁴. When a farm is infected, large numbers of animals can become ill within a short period of time, leading to major costs for the producer. While clinical illness usually lasts 7-10 days, and recovery 2-3 weeks, there are some animals that never do resume full production. In addition, "recovered" cattle may continue to shed the disease, in some cases for the life of the animal⁵.

PRECISION VACCINOLOGY™

Autogenous vaccines from Cambridge Technologies employ next generation diagnostics and state of the art production technology to create a customized product targeting the disease-causing agents in the affected herd(s). Our industry-leading molecular diagnostics, including metagenomics and next-generation sequencing, identify the specific antigens threatening the herd(s) which may need to be included in the product. Then, the experienced production team can formulate and manufacture a vaccine customized to the needs of each individual customer, including antigen concentration, multiple adjuvant choices, dose sizes, and the option of SoliDose[®] implants. SoliDose[®] implants are the tool to use in cattle for the convenience of two doses in one application and for the safety of reduced endotoxins when vaccinating against gram negative bacteria.



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WHY AUTOGENOUS?

SPECIFIC: Autogenous vaccines from Cambridge Technologies are the most targeted, science-driven solution available. The vaccines will be built around the disease strains that are identified as potential threats to the herd in question.

SPEED AND FLEXIBILITY: The nature of autogenous products means a speedy turnaround, so that emerging threats can be dealt with in a timely fashion. Should a new strain or agent emerge, future manufacturing runs of the autogenous product can be altered to include the new threat.

ANTIBIOTIC STEWARDSHIP: Many cases of clinical disease are treated with antibiotics. However, the recent implementation of FDA guidance 209 and 213 along with the expansion of the Veterinary Feed Directive has created a need for an alternative to managing animal health. Autogenous vaccines offer veterinarians and their clients a flexible management tool to counter emerging and evolving diseases.

SERVICE AND SOLUTIONS: The customer and technical service at Cambridge Technologies extends beyond the vaccine bottle. Our experienced team partners with veterinarians and cattlemen through every step of the process, from initial diagnostics through product testing and shipment, and continued monitoring moving forward.

SOURCES:

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2. Gay J. Bovine Herd Salmonellosis. <http://people.vetmed.wsu.edu/jmgay/courses/FDIHUHerdSalmonella.htm>. Updated June 16, 2015. Accessed August 10, 2017.
3. Gruenberg, W. Overview of Salmonellosis. <http://www.merckvetmanual.com/digestive-system/salmonellosis/overview-of-salmonellosis>. Accessed August 10, 2017.
4. Hanson DL, Loneragan GH, Brown TR, Nisbet DJ, Hume ME, Edrington TS. Evidence supporting vertical transmission of Salmonella in dairy calves. Epidemiol Infect. 2016 April; 144(5):962-967.
5. New York State Cattle Health Assurance Program. Salmonellosis – Background, Management and Control. <https://ahdc.vet.cornell.edu/programs/NYSCHAP/docs/SalmonellaTrifold.pdf>. Accessed August 14, 2017.
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7. United States Department of Agriculture, Animal and Plant Health Inspection Service. Salmonella and Campylobacter on U.S. Dairy Operations, 1996-2007. https://www.aphis.usda.gov/animal_health/nahms/dairy/downloads/dairy07/Dairy07_is_SalCampy.pdf. Updated July, 2009. Accessed August 10, 2017.



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