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Salmonella – Management and Solutions

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INTRODUCTION

The best management solution for Salmonellosis may be to live and dairy in sterile glass facilities. Since this is not realistic we need other options. The solution is really very simple, decrease the number of Salmonella organisms the animal is exposed to and increase the resistance (immunity) of the animal.

Cleanliness is next to Godliness. Good care and husbandry of our cows and calves, especially transition cows, is very important to help control Salmonellosis. Eradication is not a practical goal. Control means to use the best practices and products available to decrease the effects of a very ubiquitous and prevalent bacterial organism.

In 2003 at this conference Dr. Brad Smith presented: “Salmonella in Livestock: sometimes a pathogen and sometimes not.” The innate bacteriology, pathogenicity and dynamics of Salmonella bacteria all contribute to the disease entity. This does not mean Salmonella bacteria are normal intestinal inhabitants. Dr. Sheila McGuirk says there is zero tolerance for salmonella bacteria in calves.

Eleven action steps from the AABP Food and Water Symposium are good suggestions to tackle Salmonellosis. ¹

1. **Break the fecal-oral transmission link** by minimizing fecal contamination of feedstuffs, feeding surfaces, water troughs and equipment.
2. **Maximize host resistance** of susceptible animals (transition animals and newborns) and **minimize exposure dose**.
3. Control anything in the livestock environment that can perpetuate the organism including rodents, flies, nuisance birds, feral dogs and cats.
4. Because many of the infected animals are subclinical, **in an outbreak, handle all animals as if they were shedding**.
5. Implement a sound **sanitation program based on cleaning all organic matter** – feces, saliva, milk and blood – prior to use of disinfectants.
6. Look for development of **newer vaccines** that target signaling pathways and other unique strategies rather than relying on conventional bacterins for prevention and control.
7. A **healthy intestinal environment** gives cattle a competitive resistance. Survival of competitive lactobacilli offer resistance to calves. Maintain the normal gram negative flora (<1% of the gi mass of bacteria and these are primarily anaerobes) by minimizing oral antibiotic therapy.
8. **Maximize rumen function** by consistent DMI in transition and parturient cows. VFA's are toxic to salmonella.

9. Recognize extended survival time of salmonellae in the environment and deal with potential for spread 4 to 5 years after outbreak.
10. Minimize the chance for salmonellae to replicate by minimizing time in moist, warm environmental conditions. Mix feeds in smaller batches and feed soon after mixing. (Don't feed the waste TMR to young stock.)
11. Warn farm families about the **zoonotic potential**.

ORAL ADDITIONS AND/OR TREATMENT

Several oral products are available on the market to help treat or help prevent Salmonellosis. For adult animals, mannon oligosaccharides and probiotics containing lactobacillus and propionibacterium bacteria may be of value in certain cases. For calves, products containing egg produced salmonella antibody may help control Salmonella. These products should be used as "management tools" and not a management "cover up".

Good colostrum management is very important in our calves. Good quality, clean or pasteurized colostrum with adequate antibody levels to salmonella and other pathogens will greatly decrease morbidity and mortality in young calves.

VACCINES

Who in the dairy business vaccinates for Salmonellosis? NAHMS 2007 reported on Salmonella vaccine usage:

Heifers in Herds	<100	100-499	>500
	12.5%	34.4%	52.5%
Cows in Herds	<100	100-499	>500
	16.2%	37.9%	55.0%

Generally Salmonella vaccines are grouped as:

Bacterins:	Commercial Licensed Vaccines Autogenous
Modified live:	One licensed as Salmonella Dublin
Core Antigen:	J-5 Vaccines Endovac-Bovi
SRP Technology:	Salmonella Newport Bacterial Extract

Vaccines (Salmonella) need to be used as management tools to enhance the immunity (resistance) of the hosts. Bacterins, commercial and autogenous, have been available for many years. A modified live Salmonella Dublin vaccine from Fort Dodge Animal Health is licensed for calves two weeks and older. J-5 vaccines have been available for approximately twenty years. SRP Salmonella Newport Bacterial Extract vaccine was licensed for cattle in 2004. A recent challenge trial demonstrated efficacy in calves approximately 5 months of age. Also, a recent trial by Kansas State University showed

increased milk production and decreased SCC in a Kansas Dairy herd with subclinical Salmonellosis.²

CONCLUSION

With wide spread prevalence and multiple sources to the Salmonella bacteria our modern dairies are always at risk of Salmonellosis. We have tools available to help control and protect our dairies. Our use of these tools and good management will help reduce clinical disease and subclinical losses for our producers.

References:

1. McGuirk, Shelia and Peek, Simon, Preconvention Seminar 7: Dairy Herd Problem Investigation Strategies, AABP 36th Annual Conference, September 15-17, 2003-Columbus, OH
2. Hermesch, D. Thomson, D. et. al. The Effects of a Commercially Available SRP Salmonella Newport Vaccine on Milk Production, Somatic Cell Count and Salmonella Shedding in Dairy Cows with No Clinical Signs of Salmonellosis. Research Summaries: AABP 40th Annual Conference, September 20-22, 2007, Vancouver, BC