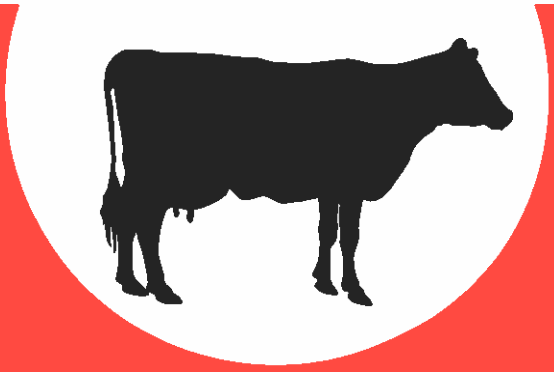
Streptococcus Uberis Bacterin

Vaccination Strategies

Establishment and maintenance of herd immunity is the key to success with this vaccine.



First Year of Use:

Milking Herd

Herds with known or suspected S. uberis infection should initiate use of the vaccine with whole herd vaccination followed by a rolling vaccination maintenance program. Whole herd vaccination involves vaccination of the entire herd with three doses spaced at monthly intervals and is accomplished in two months' time.

Dry Cows, Incoming Heifers

Dry cows and incoming heifers are managed separately from the rest of the herd. Cows already in the dry pen when the rest of the herd is being vaccinated should be vaccinated beginning at three weeks fresh, with three doses of vaccine spaced at monthly intervals. If possible, heifers should be vaccinated at seven and eight months gestation, with a third dose given at three to four weeks fresh. Otherwise, vaccinate heifers on the same protocol as dry cows.

Individual Cow

If a cow shows an elevated SCC on two consecutive tests, or has a single test above 500,000, a booster dose should be given.

Subsequent Years:

Once the entire herd has been vaccinated, a rolling vaccination schedule is used to maintain herd immunity. Rolling herd vaccination times vaccine doses to the lactation cycle, much like a J-5 type vaccine. Vaccinate at dry-off, mid-dry, and at three to four weeks fresh. Alternatively, cows may be vaccinated at dry-off, three to four weeks fresh, and at seven to eight weeks fresh.

If a cow shows an elevated SCC on two consecutive tests, or has a single test above 500,000, a booster dose should be given.

General Instructions:

Shake well before using, and occasionally during use. Administer 5cc subcutaneously (under the skin) to each animal. Do not vaccinate within two weeks before or after freshening.

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CASE STUDY: REDUCTION IN BULK TANK SOMATIC CELL COUNT ON A COMMERCIAL DAIRY ASSOCIATED WITH USE OF A *STREPTOCOCCUS UBERIS* BACTERIN

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Introduction

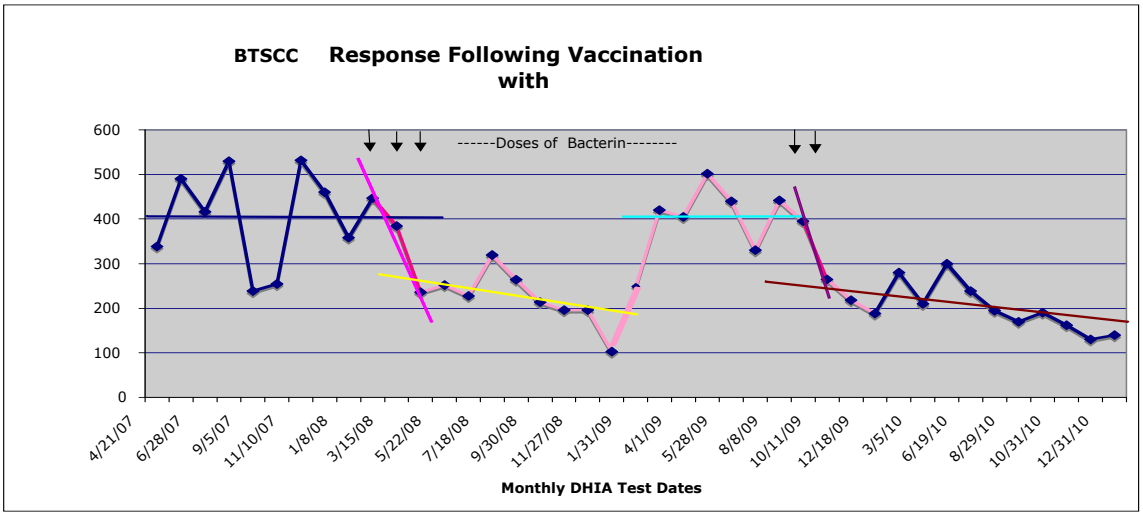
Streptococcus uberis is one of the most prevalent mastitis pathogens on U.S. dairies (Roberson, et al., 2010). Because the organism can be contagious and generally has an environmental reservoir, existing management methods can be inadequate (Zadoks, 2003; Leigh, 1999). Additionally, *S. uberis* mastitis can be refractive to antibiotic treatment (Cattell, 1996; Milne, et al, 2005). We were interested in the potential effect vaccinating the entire milking herd (450 cows) with a Streptococcus uberis bacterin might have upon bulk tank somatic cell counts (BTSCC) in a commercial setting.

Materials and Methods

The study dairy had a history of elevated BTSCC, individual animals with persistently elevated somatic cell count (SCC), and *S. uberis* isolations from fresh and high SCC cows. The dairy was free of *Streptococcus agalactiae* and practiced culling of cows infected with *Staphylococcus aureus*. Three doses of a *Streptococcus uberis* bacterin were administered at monthly intervals starting in January 2008. The study was longitudinal with historical BTSCC serving as a baseline. In February 2009, BTSCC abruptly returned to the baseline level and remained there until the herd was revaccinated using two doses of the bacterin spaced one month apart beginning in August 2009. Thereafter, cows and heifers were vaccinated at dry off (seven months gestation), again at 25-30 days fresh, and at 50-60 days fresh. Beginning in June 2010, any animal which developed an SCC above 1 million cells per ml or was above 250,000 cells per ml for two test dates in a row was also boostered with a single dose of vaccine.

Results/Discussion/Conclusion

The pre-vaccination (April, 2007 - January, 2008, n =10 months) mean BTSCC was 402,000 ± 111,000 cells/ml and the slope of that data was essentially zero (see graph). Vaccination distinctly correlated with a sharp reduction in BTSCC to a post-vaccination (May 2008 - January 2009, n =9 months) mean of 224,000 ± 60,000 cells/ml. Post-vaccination mean BTSCC was significantly ($p < 0.001$) different from pre-vaccination mean BTSCC. Following this period, BTSCC increased in a similarly distinct fashion to the pre-vaccination level (February 2009 - August 2009, n = 7) of 423,000 ± 56,000 cells/ml. Revaccination once again correlated with a reduction in BTSCC (November, 2009 - December 2010, n = 13 months; "post-revaccination") to 202,000 ± 42,000 cells/ml. The post-revaccination mean BTSCC was statistically different from the "Escape" mean BTSCC ($p < 0.001$).



The major factor influencing SCC at the quarter, cow or bulk tank level is an infection of the mammary gland (Harmon, 1994). Although many agents are known to be able to increase SCC, relatively few are capable of exerting herd-wide effects that manifest as high BTSCC. These include *Staphylococcus aureus, Streptococcus agalactiae* and *Streptococcus uberis*. In the present study, individual cows were cultured upon freshening, whenever a quarter became clinical, and when high SCC was detected. *S. aureus* was not thought to contribute to the high BTSCC because infected cows were culled upon identification. Pre-vaccination milk cultures suggested the herd was free of *S. agalactiae. S. uberis* was routinely isolated. Although the precise relationship between use of this vaccine and the associated reduction in BTSCC remains to be fully elucidated, the observed effect could prove useful on dairies through the concomitant improvement in milk quality and production.

References

Cattell, M.B. 1996. An outbreak of Streptococcus uberis as a consequence of adopting a protocol of no antibiotic therapy for clinical mastitis. Proc. 33rd Annual Meeting of the National Mastitis Council. pp 123-126.

Harmon, R.J. 1994. Physiology of Mastitis and Factors Affecting Somatic Cell Counts. J Dairy Sci. 77:2103-2112.

Khan, I.U. 2002. Identification and Further Characterization of Streptococcus uberis and Streptococcus parauberis Isolated from Bovine Milk Samples. Dissertation, Justus-Liebig University, Giessen, Germany.

Leigh, J.A. 1999. Streptococcus uberis: a permanent barrier to the control of bovine mastitis? Vet. J. 157:225-238.

Milne, M.H., A.M. Biggs, D.C. Barrett, F.J. Young, S. Doherty, G.T. Innocent, and J.L. Fitzpatrick. 2005. Treatment of persistent intra-mammary infections with Streptococcus uberis in dairy cows. Vet. Rec. 157:245-250.

Roberson, J., J. Mixon, S. Oliver, B. Rohrbach, and R. Holland. 2010. Etiologic mastitis agents of high somatic cell count dairy herds in Tennessee. The Bovine Practitioner. 44: 138-45.

Zadoks, R.N. 2003. Streptococcus uberis: environmental or contagious pathogen? Proc. 49th Annual Meeting of the National Mastitis Council. pp 61-67.