



PROFESSIONAL SERVICES

Boehringer Ingelheim Vetmedica, Inc.

TECHNICAL BULLETIN

How LYSIGIN® Bacterin Works

Key Points

Bovine Udder Immune Mechanisms¹

- Keratin, a mesh-like substance, partially occludes the teat canal lumen and inhibits bacterial penetration.
- Smooth muscle around the teat canal maintains tight closure and inhibits bacterial penetration.
- Many leukocytes, or white blood cells, kill bacteria or process bacteria by presenting them to lymphocytes for antibody production; in the face of subclinical or clinical infections leukocytes migrate to the udder from the blood.

Udder Antibody

Most udder antibody is IgG derived from blood serum. IgA and IgM, produced in the udder lymph tissue, passes into milk through mammary cells along with the IgG from the blood. Milk in normal udders contains small amounts of antibody. Antibody concentration increases when swelling or inflammation increases. Blood vessel permeability in the udder tissue is decreased as inflammation increases and antibodies then transfer into milk from the lymph tissue and blood. *Staph aureus* vaccination stimulates an antibody response in the blood and in the lymph tissue around the milk cisterns.

Antibodies do not occur in high levels in the milk of normal udders. After bacterial invasion and inflammation, antibodies pass into the milk to reduce the severity of the mastitis and possibly rid the udder of the organism as illustrated in the drawing below. This coincides with findings of Dr. J.W. Pankey.^{2,3} His studies show spontaneous cure rate was significantly higher in cows vaccinated with **LYSIGIN**. In two studies spontaneous cure rates were 61% and 76% in vaccinates and only 21% and 30% in controls. Clinical signs were also less in vaccinates.

The Bottom Line

- **LYSIGIN** bacterin should be initiated first in heifers to prevent *Staphylococcus* infections from chronically infecting udders and thereby extending the length of time a dairy cow can remain in the milk line.

- ¹ Nickerson, S.C., Immune Mechanisms of the Bovine Udder: An Overview. **American Journal Veterinary Medicine**, Vol. 187, No. 1, July 1, 1985,
- ² Pankey, J.W.; Duirs, G.; Twomey, A.; **Evaluation of a Commerical Bacterin Against *Staphylococcus aureus* Mastitis in New Zealand**, Dairy Research Report, Louisiana Agricultural Experiment Station. 1983.
- ³ Pankey, J.W.; Boddie, N.T.; Watts, J.L; **Preliminary Report on Protein A and a Commercial Bacterin as Vaccines against *Staphylococcus aureus* Mastitis in Dairy Cattle**, Dairy Research Report, Louisiana Agricultural Experiment Station. 1983.

