

# Prevention of Intramammary Infections by Following a Teat Dipping Program<sup>1.</sup>

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Bovine mastitis is a general term applied to a group of diseases of the udder. Some 20 different types of pathogens have been isolated from infected udders, but 97% of them were Streptococcus agalactiae, Streptococcus dysgalactiae, Streptococcus uberis and Staphylococcus aureus. Any of these four main udder diseases may occur in various degrees:

1. Subclinical mastitis causes no swelling or gross abnormality of the milk, but is detectable by special tests.
2. Mild-clinical mastitis causes slight swelling, sensitivity and heat of the udder and may cause flakes, clots and a watery appearance of the milk. It is detectable by barn tests.
3. Severe-clinical mastitis involves a sudden onset with swelling of the infected quarter, which is hot, hard and sensitive. The secretion appears abnormal and milk production drops.

The teat canal is the primary barrier to new intramammary infections (IMI), which usually result from microorganisms ascending through the teat canal. Consequently, if no microorganisms contact the teat end, no IMI would result. Milking time hygiene seems to offer the greatest potential for preventing udder infection. There are at least four sources of microbial contamination and transmission from cow to cow at milking time. These sources include the milking unit, skin on the end of the teat, udder washing cloths, and hands of the milker. Several laboratories have tried to find a minimum effective procedure for reducing new infections during lactation, by adding to the normal milking routine only the dipping of all teats in a germicide immediately after each milking.

Schultz, W. D. and Smith, J. W. (J. Dairy Sci., 53:38, 1970) were able to accomplish a 96% reduction of micrococci on the skin at the opening of the teat using a 0.2% chlorhexidine teat dip under practical farm conditions. In addition, the chlorhexidine teat dip was used to sanitize half of the udder of 12 cows against exposure of the entire udder to Staphylococcus aureus applied at each milking through contamination of the milking machine teat

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cups. During 31 weeks of such challenge, nine new gland infections appeared among the undipped quarters whereas there were only three new infections among the dipped quarters.

In a field trial in which a commercial iodine preparation was used to dip only teats on the right side of the cow, Wesen, D. P. and Schultz, L. A. (J. Dairy Sci., 52:938, 1969) succeeded in reducing the new infection rate by 53% as compared to that in the left udder halves. The new IMI on the dipped side resulted in an estimated 3925 infection days during the experiment as compared to 9320 infection days on the control side. In a similar experiment (Marshall, R. T., Sikes, J. D. and Morgan R. D., J. Dairy Sci., 52:938, 1969), two teats on one side of the udder were disinfected with either hexachlorophene or iodophor germicidal preparations and the opposite teats served as non-disinfected controls. After 6 months the procedure was reversed and each cow was disinfected on the opposite quarters. Hexachlorophene and iodophor preparations caused a 25% and 16% reduction in CMT reactors, respectively. Isolation of hemolytic bacteria was 47% lower among disinfected quarters after the first 6 months than among opposite non-disinfected quarters. At 14 months after the switch in disinfected quarters, there was a 40% reduction of hemolytic infections in disinfected quarters relative to non-disinfected quarters. Clinical evidence of mastitis decreased approximately 52% since it was necessary to treat about twice as many quarters among the controls.

There is evidence that the overall effects of teat dipping or hygiene routines may be partially neutralized by new dry-period infections. Likewise the effects of dry cow medication alone are nullified by new lactation infections. This has led to the proposal that lactation-hygiene (teat dipping) and dry cow medication be combined into a preventative mastitis program. Treatment of the mammary gland during the dry period should serve two important purposes: (1) eradication of existing IMI, and (2) decrease the incidence of new IMI during the dry period. Cornell investigators (Roberts, S. J. et. al. J.A.V.M.A., 155(2):157, 1969) compared two lactation hygiene programs combined with a dry period treatment in reducing the herd infection level. The use of a 4% (40,000 p.p.m.) sodium hypochlorite solution (5.25% clorox) as a post milking teat dip and dry period medication with a streptomycin and penicillin preparation reduced the percentage of infected quarters by 75% (40 to 10%) over a 21 month period. The percentage of infections due to Staphylococcus aureus, Streptococcus agalactiae, Streptococcus dysgalactiae and Streptococcus uberis over the 21 month period was reduced 38%. The results of this study indicate that infection levels in herds can be decreased considerably by relatively simple hygiene and treatment practices.

Progress in reducing herd mastitis infection levels is a gradual process over a period of months, and visible improvements should not be expected "overnight".

#### Summary

A post milking teat dip reduces the incidence of new infections during lactation and the number of clinical cases requiring antibiotic therapy. Such a teat dipping program combined with dry cow treatments, with an appropriate antibiotic in a slow release base, appears to provide a highly effective program for controlling clinical and sub-clinical udder infections.