A Practical Approach to Reducing the Incidence of Intramammary Infection in Heifers by Using Prepartum Systemic Tylosin Therapy

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Introduction

While mastitis in heifers is recognized as a problem, most dairymen often view heifers at parturition as free of intramammary infections (IMI) For example, in a survey (*Borm et al*, 2006) that included farms in seven states and one province, as many as 63% of heifers and 34% of their quarters had a IMI at calving. IMI during lactogenesis can impair mammary development and cause a decrease in milk yield in the productive life at the animal level. At the herd level IMI could cause an increase in somatic cell counts (SCC) and clinical mastitis cases. To prevent and treat IMI in heifers, infusion of antibiotics in the mammary gland before calving was proposed. However, systemic administration of antimicrobials to heifers before calving could offer advantages related to its relative lower cost and easier administration when compared to intramammary infusion. Tylosin offers an excellent diffusion into the mammary gland related to its basic pK, which results in a very high milk to plasma concentration ratio.

Materials and Methods

Heifers on a commercial farm in Michigan, due to calve within 14 to 18 days, were assigned randomly to one of two treatment groups. The control group (n = 108 heifers) received no antibiotic treatment or teat sealants to prevent IMI. Group tylosin (n = 112 heifers) animals were injected intramuscularly with 20 g of tylosin. Quarter milk samples were taken in duplicate from all functional quarters at two to six days (sample-1) and seven to 15 days (sample-2) after calving for bacterial culture. Representative isolates from sample-1 were speciated. Somatic cell counts and milk production were recorded during lactation. Culture results were analyzed using chi-square and SCC scores were analyzed as repeated measures using a mixed model procedure

Results

A total of 92 (42%) heifers were infected at calving. 46% of the heifers were infected at sample-1 in the control group and 38% in the tylosin group. At sample-2, 34.5% of the heifers were infected, 40% in the control group and 29% in the tylosin group. Spontaneous cures were observed in 19 heifers (38%) for control group and 21 animals (50%) in tylosin group. In both groups, 11% of the heifers acquired a new IMI in the first week after calving. At the quarter level, coagulase negative staphylococci (CNS) were the principal agent causing IMI. The tylosin group had 36 quarters (8.1%) infected at sample-1, and the control group had 59 quarters (13.5%). Similarly, at sample-2, CNS infected 25 quarters (5.6%) in tylosin group and 47 quarters (10.7%) in the controls. Differences in CNS infection rate for both samples were significant ($P < 0.01$). Spontaneous cure for CNS was 61% for tylosin and 49% for controls. Streptococci infected 3.6% of the quarters at sample-1 and 2% at sample-2. When analyzing IMI by season, tylosin treated heifers had significantly fewer infections caused by CNS in summer when compared to controls at sample-1 and sample-2 ($P < 0.05$). No differences were observed in SCC and milk production.

Significance

Systemic administration of tylosin was effective in reducing levels of IMI in heifers caused by CNS at quarter level, but routine use on this farm may not be economically sound. Transient IMI occur early in lactations with at least half of the infections cleared without antibiotic intervention. Tylosin, administration to primigravid heifers two weeks before parturition, should not be advised without a previous analysis of udder health, management, and economic implications in each individual farm. Furthermore, in this study 10% of the heifers acquire an IMI within the first week after calving, therefore special attention has to be given to environmental and housing issues. Antibiotic therapy will not replace poor management in a close-up, calving or fresh pens.

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