

# Prevention and Pirlimycin Therapy Strategies for a High Somatic Cell Count Herd: A Case Study

## A.S. Leaflet R1919

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### Summary and Implications

Objective of this field investigation was to: 1) examine the etiology and mastitis infection dynamics in a 45 cow herd and evaluate the efficacy of recommended and extended therapy (*S. aureus* only) with pirlimycin hydrochloride (Pirsue, Pharmacia/Upjohn Co. Kalamazoo, MI) for gram positive intramammary infections (IMI). Percentages of cows (quarters) infected with *Strep. agalactiae*, *Strep. dysgalactiae*, and *Staph. aureus* were 15(5); 54(23); 46(24); respectively. Cow and quarter cure rates were: *Strep. ag.*-100, 100; *Strep. dysgalactiae*- 77, 86; *Staph. aureus*- 74, 85%. High cure rates were seen for all organisms possibly due to bacterial strains involved or the limited antibiotic therapy seen in this herd over the previous 10 years. Observations at the final herd visit showed significantly improved teat end health and low new infection rate due to adoption of immediate proposed strategies. Herd SCC was down to 256,000 cells/ml within 1 month post treatment and continued to be 250-350,000 cells/ml 12 months later. Targeting prevention and therapy strategies based on causative organisms, and having a monitoring system in place can result in sustained lower SCC and improved milk quality and farm profitability.

The objectives of this field investigation were to: 1) examine the etiology and mastitis infection dynamics in a 45 cow herd during the fall-winter whose normal herd bulk tank SCC was 500,000 cells/ml but had jumped to 1 million for 3 months; 2) investigate herd management and procedures and develop and prioritize necessary changes for mastitis prevention; and 3) evaluate the efficacy of recommended and extended therapy with pirlimycin hydrochloride (Pirsue, Pharmacia/Upjohn Co. Kalamazoo, MI) for gram positive intramammary infections (IMI).

### Materials and Methods

The herd (45 cows) involved in this case study was in danger of market loss due to high SCC and was running weekly individual cow SCC to avoid this. The initial inquiry from the herd veterinarian only provided a single Pro-Staph report showing 76% cows >400,000 SCC and 87% Pro-Staph positive (9% suspect). Following telephone calls to the veterinarian, producer, and milk plant fieldperson, individual quarter milk samples of all cows were cultured and previous SCC data was obtained (32 cows with chronic high SCC; 11 with occasional high SCC). Within 3 weeks, an on-site herd visit at milking time was conducted which included obtaining a second set of aseptic quarter milk samples. Herd visit information showed a 18 kg/day milk average with cows in good body condition and

clean. Cows were housed on pasture and milked in a 2 x 2 parlor. Other housing areas included a small loafing area in an old barn and a 50' X 80' bedded shed (1/3 full of machinery). Premilking sanitation consisted of predipping as well as washing with a lot of water, drying with paper towels, no forestripping, and excessive time to unit attachment. There was some machine stripping and individual quarters pulled off under vacuum, but vacuum was usually shut off before milker unit removal. Teat dipping with a .25 iodine dip provided fair to mediocre coverage. Units were dipped in hot iodine water between cows. Teat end observations showed many cracks and lesions. Milking machine analysis showed adequate pump capacity, 53% regulator performance due to a dirty regulator and small pipe sizing, two non-functional pulsators (dirty) (Figure 1), inadequate claw and milkline size capacities, and single pulsation. Strategies for preventing new IMI were categorized as immediate (cleaned pulsators, cleaned regulator, teat dip (better, more consistent coverage and a 1% iodine dip), milking procedures (washing teats eliminated, forestripping instituted, unit attach time optimized, eliminated machine stripping and unit removal under vacuum)), short (update equipment for proper sizing), or long term (conversion of part of machinery shed to a free stall barn) and were discussed and immediate changes were implemented on that visit where possible. Based on subsequent bacterial cultures, a herd therapy trial was instituted. This herd had not treated intramammary (dry or lactating) for at least 10 years. All gram + infected quarters (excluding *Staph. aureus*) were treated IMM 2X 24 hr apart with one 10 ml plasset 50 mg Pirlimycin HCl, with *Staph. aureus* quarters treated 3 times with this series at 48 hrs between treatment series. Individual cow SCC were run 21 days post treatment and the herd was visited 31 days post treatment to obtain aseptic quarter milk samples and assess prevention changes and results.

### Results and Discussion

Herd culture results prior to the therapy trial are shown in Table 1. The percentages of cows (quarters) uninfected or infected with *Strep. agalactiae*, *Strep. dysgalactiae*, and *Staph. aureus* were 17(46); 15(5); 54(23); 46(24); respectively. Only 46% of cows had *Staph. aureus* on multiple cultures compared to 87% being Pro-Staph positive. This supports that there was a high level of exposure of *Staph. aureus* to many animals and quarters, but lessened IMI probably due to the other established *Strep. IMI*. The high level of *Strep. dysgalactiae* correlates well to the high degree of teat end lesions, while the moderate level of *Strep. agalactiae* correlates to teat dip coverage weaknesses. Cultures 31 days post treatment (21 days post last treatment withdrawal times) (Table 2) showed the following cow and quarter cure rates: *Strep. ag.*-100, 100; *Strep. dysgalactiae*- 77, 86; *Staph. aureus*- 74, 85%.

High cure rates were seen for all organisms possibly due to bacterial strains involved or the limited antibiotic therapy seen in this herd over the previous 10 years. Observations at this herd visit also showed significantly improved teat end health (pulsator and teat dip changes) and low new infection rate due to adoption of immediate proposed strategies. Herd SCC was down to 256,000 cells/ml within

1 month post treatment. The herd was monitored over the next 12 months and SCC continues to be 250-350,000 cells/ml. The herd is now dry treating, made milking equipment changes to enhance flow capacity, and plans have been developed to convert the bedded shed into a free stall barn.

**Table 1. Herd culture results prior to therapy based on 2 different samplings**

	<u>No. (%) cows</u>	<u>No. (%) quarters</u>
Uninfected	7 (17%)	76 (46%)
Strep. agalactiae	6 (15%)	8 (5%)
Strep. dysgalactiae	22 (54%)	38 (23%)
Staph. aureus	19 (46%)	39 (24%)
Coag. neg. staph.	1 (2%)	3 (2%)

**Table 2. Cure rates for gram + IMI using recommended (\*) or extended pirlimycin therapy (\*\*)**

	<u>Strep. agalactiae</u> *	<u>Strep. dysgalactiae</u> *	<u>Staph. aureus</u> **
Cow cure rate	100%	77%	74%
Quarter cure rate	100%	86%	85%

\*Recommended therapy = treated intramammary 2x with one 10 ml plasset 50 mg pirlimycin HCl 24 hrs apart;

\*\*Extended therapy = 3 series of recommended therapies 48 hrs apart

Figure 1: Milking machine analysis graphs

