

# The Value of Retreating the Dry Cow

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## Introduction

Mammary gland infusion of the cow at drying off has been shown to be an efficacious and profitable management technique for reducing mastitis.<sup>1</sup> However, it is unknown as to whether retreatment during the dry period might provide additional benefits. Cows are susceptible to recurrent mastitis following drying off and again as parturition approaches.<sup>2</sup> The main purpose of dry cow therapy is to prevent new infections during this period. Long-acting mammary infusion products provide therapeutic levels for approximately 20 days. Concentrations of benzathine cloxacillin (500 mg) in dry udder secretions were above the minimal inhibitory concentration for *Strep. agalactia* and *Staph. aureus* for approximately three weeks.<sup>3</sup> The recommended dry period, however, is usually 60 days. Therefore, during the latter part of the dry period, the mammary gland is no longer protected by an antibiotic infused at drying off. Since mastitis occurs frequently at parturition and immediately thereafter, retreatment of the udder two to three weeks prior to calving might provide additional protection pre and postpartum. There are few reported studies of retreatment during the dry period. One study<sup>4</sup> compared no treatment to a single or three treatments. In that study, the multiple treatments were given at 0, 7, and 14 days of the dry period using benzathine cloxacillin (500 mg per quarter).

Considering all genera of bacteria isolated, 75.5%, 73.5%, and 52.8% of infections were eliminated in the multiple, single and no infusion groups, respectively. The authors concluded that multiple treatments did not offer any advantage over a single treatment with cloxacillin. In this study, retreatment was performed within the first two weeks after drying off. If dry cow therapy is effective for only about three weeks, and the udder is susceptible to new infections at parturition, a prepartum treatment with a lactating infusion product might reduce infections pre and postpartum. Hence, our study was undertaken to

evaluate dry cow therapy with retreatment using a lactating product (Cephalosporin) two to three weeks before parturition. A cephalosporin product was chosen because of its effectiveness against gram-negative bacteria, particularly coliforms.

## Materials and Methods

Holstein cows in a 420-cow purebred herd were used in the study. Mastitis control programs had been used for several years. The herd consistently had a somatic cell count below 200,000. *Strep. agalactia* had been eliminated from the herd a number of years previously and *Staph. aureus* was present at very low levels. Lactating cows were housed in freestalls on shavings. Clinical mastitis in lactating cows occurred at an incidence of approximately 2.9% per month. Mastitis prevention including predipping, drying with individual paper towels, proper milking procedure and post-dipping was practiced. Dry treatment entailed infusing all quarters with benzathine cloxacillin<sup>a</sup> following appropriate udder and teat sanitation after the last milking.

After treatment, teats were dipped using 1% iodophore teat dip and the cows released into a dirt lot with a roofed shed bedded with wood byproducts. Two to three weeks before parturition, cows were brought to a lot close to the barn. At that time, cows were vaccinated with *E. coli* K99<sup>b</sup> and *Hemophilus somnus* antigens, and injected subcutaneously with 10cc of selenium.<sup>d</sup> After sanitation of the udder and teats, every other cow was treated with an intra-mammary cephalosporin infusion product. Each quarter was infused with 200 mg cephalosporin. The CMT reaction and the occurrence of

<sup>a</sup>Dry Clox®—Bristol Laboratories or Orbenin®—Beecham Laboratories.

<sup>b</sup>Coli-Bovis®—Beecham Laboratories, Bristol, TN 37620

<sup>c</sup>Somny Tech®—Tech America, Omaha, NE 68134

<sup>d</sup>MUSE Schering Corp., Kenilworth, NJ 07033

mastitis was monitored at parturition. Quarters with a CMT 3 reaction were cultured. A diagnosis of mastitis was made if cows had a CMT 3 reaction and significant pathogens were isolated within the first week postpartum. Alternate cows were left untreated.

### Results

The incidence of mastitis and the CMT reaction at or shortly after calving following prepartum retreatment as compared to no retreatment is shown in Table 1.

TABLE 1. Incidence of mastitis and CMT reaction in dry cows with and without prepartum retreatment.

Findings at Parturition			
Retreatment	Mastitis	CMT 2	CMT 3
Yes	11/115 (10%)	18/115 (16%)	18/115 (16%)
No	18/107 (17%)	14/107 (13%)	26/107 (24%)

Of 115 cows that were retreated with a lactating infusion product (Cephalosporin) 11 (10%) were diagnosed to have mastitis.

Many of these cows were diagnosed as having mastitis without clinical signs or visibly abnormal secretions. Eighteen (16%) cows had one or more quarters rated as CMT 2 reaction within three days of freshening. Another 18 (16%) cows had one or more quarters rated as a CMT 3 reaction within three days of calving. In the group (107 cows) that was not retreated, 18 (17%) had mastitis, 14 (13%) were rated to have one or more quarters with a CMT 2 reaction and 26 (24%) were rated to have a CMT 3 reaction. Although almost twice as many cows had mastitis in the control group as compared to the retreatment group, these values were not significantly ( $p > 0.05$ ) different. CMT reactions also favored the cephalosporin retreatment group, but again these differences were not significant ( $p > 0.05$ ).

### Discussion

The efficacy of retreating the dry cow has been controversial among veterinary practitioners. Some contend that the teat sphincter is sealed during the dry period and should not be violated, especially when retreatment is performed by nonveterinary personnel. In this study, the difference in clinical mastitis for retreatment (10%) as compared to no retreatment (17%) was not statistically different although there was a trend favoring retreatment.

If the incidence of mastitis can be reduced, is there

possibly an economic benefit for retreatment? An economic analysis might have merit beyond the statistical comparison of incidence. In Table 2, the cost of treating a simple and a severe mastitis episode and prophylactic retreatment is outlined.

TABLE 2. Cost of a mastitis episode and prophylactic retreatment.

	Drug	Labor	Milk Loss	Total
Simple mastitis	3.50	.75	34.50	38.75
Severe mastitis	25.00	20.00	34.50	79.50
Proph. retreat.	4.75	1.25	--	6.00

The cost (\$4.25) for treatment of simple mastitis not requiring professional services assumes one quarter is treated for three days and that it takes approximately three minutes for the infusion. The cost (\$45.00) for severe mastitis assumes professional services (30 min.). The cost for treating an average mastitis episode has been calculated at \$15.00.<sup>5</sup> The milk loss of \$34.50 assumes milk loss during three days of treatment plus another three days for drug withdrawal. It also assumes 50 lbs. of milk production during the first week of lactation with a milk price of \$11.50 per 100 lbs. of milk.

Applying the probability of mastitis (risk) from our study of retreated and nonretreated cows, an economic comparison is made in Table 3.

TABLE 3. Evaluation of prophylactic retreatment for mastitis control.

Severity	Retreatment			No Retreatment		
	Retreat- ment Cost/ Episode	Risk	Total Cost	Retreat- ment Cost/ Episode	Risk	Total Cost
Simple mastitis	6.00 + 38.75 x	.096	9.72	0.00 + 38.75 x	.168	6.51
Severe mastitis	6.00 + 79.50 x	.096	13.63	0.00 + 79.50 x	.168	13.36

In the case of simple mastitis the cost with retreatment (\$9.72) is considerably more than the cost for treating one episode without retreatment (\$6.51). For severe mastitis, using \$45.00 as the cost for one episode, retreatment approaches the breakeven point (\$13.63 vs \$13.36).

## References

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This economic comparison shows no benefit for prepartum retreatment. However, no economic consideration was given for subclinical mastitis, possible premature culling, or death. This might favor pretreatment if prolonged milk loss from subclinical mastitis, premature culling or death were included. Based on this study, prophylactic retreatment cannot be recommended routinely for cows prepartum unless there is a high incidence of severe clinical mastitis following parturition.

## PRACTICE TIP

### A Teat Surgery Technique

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One of the more exasperating items in my career has been the inability to achieve success in surgery on severe bovine teat lacerations. All efforts and techniques seem to produce the same minimal satisfactory results. Dr. William Donawick of New Bolton Center, University of Pennsylvania can take credit for directing me out of these doldrums by trying some new techniques. Although our procedures now vary, my success rate has changed markedly. I attribute this change to several factors:

1. Early intervention is mandatory. The prognosis decreases dramatically after 6-8 hours.
2. Dorsal recumbency in a clean area or in-house surgery facility increases results in several ways.
  - a. Milk is not flowing into the surgical site during surgery. Gravity works.
  - b. You can see what you are doing to perform proper teat lining closure and identify other layers as well.
  - c. You are not dodging feet.
3. A three inch Jorgensen plastic teat cannula (#J13L) inserted into the teat canal pre-surgically will drain milk, help to identify an often mangled

teat lining, and provide milk drainage post surgically for as long as necessary which helps keep milk pressure from stretching the suture line. The end is open to provide constant milk drainage.

4. Four 0 PDS suture in 3–4 layer closure provides a very non-reactive, monofilament, absorbable suture material for all layers and the skin.
5. An elasticon wrap over enough gauze sponge to just cover the wound with a small amount of Dermacens ointment (Dermatologic Cream by Beecham). This allows for maximal contact between the one inch elasticon tape strips and teat skin for maximal holding power. The wrap helps reduce swelling quickly, protects the wound and provides a place for manure and bedding to stick besides the suture line. This can be removed in 5–7 days and only reapplied if necessary.
6. Post-operative intramammary treatments are at the surgeon's discretion. The teat tube can be plugged for one hour post treatment if leakage occurs.
7. The teat tube is removed on a trial and error basis after 7–10 days. A new one can be reinserted by the owner if he is still experiencing difficulty getting milk to flow by hand or machine. The record cannula remained in place for 53 days with no signs of mastitis.

These cannulas are also excellent for traumatized teats which are difficult to get milk from. They provide drainage while the teat organizes and heals. After removal, the sphincter often constricts to a very functional level.

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