DRY COW TREATMENT OF BEEF COWS

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Story in Brief

Spring calving range beef cows were used to determine the effects of intramammary dry cow treatment on udder health and subsequent calf growth. At weaning, cows were assigned to intramammary treatment (n = 45) or untreated controls (n = 45). Milk samples from each quarter were collected prior to treatment at weaning and at the subsequent calving for analysis of somatic cell counts (SCC) and bacteriology. Treatment at weaning decreased intramammary infection at calving. Dry cow treatment reduced the presence of *Coagulase negative staph.* infections at calving from 42% for controls to 18% for treated cows, but did not influence the incidence of *Staphylococcus aureus* infections at calving. Treatment did not alter average SCC per cow, but did decrease maximum SCC (MXSCC) per cow after calving compared with control cows. Cows with greater SCC at weaning had greater average SCC and MXSCC at calving compared with cows that had less SCC at weaning. Dry cow treatment did not alter adjusted weaning weights the following fall. Dry cow treatment of beef cows at weaning reduced intramammary infection and SCC at the subsequent calving.

(Key Words: Beef Cow, Mastitis, Weaning Weight, Dry Cow, Infection.)

Introduction

Weight of calves at weaning is the main commodity of beef cow producers. Milk production of cows is a major factor that influences weaning weights (Rutledge et al., 1971). Intramammary infection, and increased somatic cell counts decrease milk production of beef cows and weight gains of calves (Newman et al., 1991; Simpson et al., 1995; Lents et al., 1996a). Intramuscular therapy of beef cows with oxytetracycline at drying off and after calving did not influence weaning weights of calves (Lents et al., 1996a). Consequently, if producers could implement another type of treatment, mastitis may be reduced, and weaning weights may be increased. The objective of this experiment was to determine the effect of intramammary dry cow therapy on the prevalence of mastitis-causing organisms and calf growth during the subsequent lactation.

Materials and Methods

Spring calving Hereford and Hereford x Angus cows (n = 90) were utilized to determine the effects of intramammary treatment with penicillin G procaine and novobiocin sodium on intramammary infection and calf growth following the subsequent calving. Cows grazed native range at the Range Cow Research Center, 15 miles west of Stillwater, OK. At weaning, cows were blocked by age and assigned to receive intramammary treatment with antibiotic (n = 45) or control (n = 45).

Quarter milk samples were collected at weaning and again 8 to 14 d after the subsequent calving. Calves were removed from cows for 2 to 3 hours before milk collection. Cows were confined in a squeeze chute and administered 10 units of oxytocin (i.m.) to facilitate milk let down. Teats were dipped with .1% iodine solution and wiped dry with paper towels. Ten mL of milk from each quarter were collected into plastic vials containing Microtablets for preservation and analyzed for somatic cell counts (SCC) at the Dairy Herd Improvement laboratory, Manhattan, KS. Teat ends were then wiped with a cotton swab soaked in 70% ethyl alcohol, and 2 streams of milk from each quarter were discarded. Three mL of milk from each quarter were aseptically collected into sterile snap cap tubes. Sterile samples were placed on ice, transported to the lab, and stored at -20 ^{o}C, until they were later packaged in dry ice and transported to the Immunology and Disease Resistance Laboratory USDA-ARS, Beltsville, MD, for bacteriological analysis.

Teat ends were again individually wiped with alcohol soaked pads, and each quarter was treated with an intramammary infusion. Teat ends were held firmly to retain the infusion product in the udder, and udders were lightly massaged two or three times from the tip to the dorsal surface to facilitate the movement of the infusion product upward into the udder. After treatment, each teat was dipped with .1% iodine solution and the cow was released. Control cows received no intramammary infusion, however, each teat was dipped with .1% iodine after sampling.

Following the subsequent calving, calf weights were recorded at birth and every thirty days from May 5 until weaning in October.

Results and Discussion

Dry cow treatment significantly reduced intramammary infection at the subsequent calving. Fifty-five percent of control cows were infected at the subsequent calving compared with only 30% of treated cows (P<.03; Table 1). Infection at treatment influenced (P<.02) the presence of infectious organisms at the following calving. Only 29% of cows that were not infected at weaning were infected at calving. However, 56% of cows that were infected at weaning were still infected at calving. Thirty-nine percent of control cows not infected at weaning were infected at calving compared with only 20% of treated cows (P<.1). Only 40% of treated cows infected at weaning were still infected at calving compared with 71% of control cows (P<.1). Newman et al. (1991) found that intramammary dry cow treatment of beef cows was effective in decreasing udder infection, and indicated that this reduction was not due to prevention of new infections, but rather the elimination of infections that were present at weaning. Our results indicate that not only were some of the infections present at weaning eliminated, but the incidence of new infections was decreased.

We previously determined that *Staphylococcus aureus* and *Coagulase negative staphylococci* are the major mastitis causing organisms in our herd (Duenas et al., 1994, 1995; Lents et al., 1996a, 1996b). Treatment at weaning did not influence the presence of *Staph. aureus* at calving. Treatment at weaning decreased (P<.02) the presence of *Coagulase negative staphylococci* at calving. Only 18% of treated cows were infected with *Coagulase negative staphylococci* at calving compared with 42% of control cows (Table 1).

Previously we determined that increased SCC was associated with decreased calf gain (Lents et al., 1996b). Dry cow treatment at weaning did not decrease average SCC per cow at calving (Table 1). However, dry cow treatment decreased (P<.06) maximum SCC (MXSCC) in any quarter of a cow compared with controls (454 x 10^3 vs 761 x 10^3 cells/mL, respectively; Table

1). Cows with greater (>165,000 cells/mL) average SCC at weaning had greater average SCC at calving compared with cows that had less SCC at weaning (184×10^3 vs 52×10^3 cells/mL, respectively; *P*<.03). Cows with greater MXSCC at weaning had greater MXSCC at calving compared with controls (830×10^3 vs 385×10^3 cells/mL, respectively; *P*<.1). Dry cow treatment did not alter average SCC, and cows with greater SCC at weaning still had greater SCC at calving. SCC are greater in early and late lactation, but are decreased during mid lactation (Hunter and Jeffrey, 1975; Schultz, 1977; Simpson et al., 1995). Cows were initially sampled during late lactation, thus SCC may not accurately reflect SCC during the lactation. Increased SCC at 8 to 14 d after calving may be due to greater SCC during early lactation.

Treatment at weaning did not influence adjusted weaning weights (ADJWW) of calves after the next lactation (Table 1). Somatic cell counts of cows at the calving following treatment did not influence ADJWW of calves the next fall. Although dry cow treatment decreased the presence of infectious organisms at calving, the decrease may not have been large enough to increase calf weight gains. In addition, cows may be reinfected during the lactation, and this would negate any benefit that may have occurred due to dry cow treatment. In this replicate, only 90 cows were studied. Since weaning weight is influenced by many factors, additional animals must be studied to determine if dry cow treatment influences weaning weights.

In conclusion, intramammary dry cow treatment of beef cows with penicillin G procaine and novobiocin sodium decreased the percentage of infected cows at the next calving. However, treatment did not alter average somatic cell counts per cow, or adjusted weaning weights of calves.

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Table 1. Effects of dry cow treatment on infection rate, organisms, somatic cell counts (SCC), and adjusted weaning weights.		
Item	Treated	Control
Cows infected at treatment, %	22	30
Cows infected at calving, %	30[a]	55[b]
Cows infected with *Coagulase negative staphylococci* at calving, %	18[a]	42[b]
Cows infected with *Staphylococcus aureus* at calving, %	6	13
Average SCC / cow at calving, $x10^3$ cells/mL	142 ± 39	94 ± 38
Maximum SCC / cow at calving,$x10^3$ cells/mL	454 ± 164[a]	761 ± 158[b]
Adjusted weaning weights, kg	242 ± 8	243 ± 8

a,bMeans within a row differ (*P*<.05).

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