The Influence of Using a Neomycin and Chlorobutanol Compound in Dry Cow Treatment on the Control of Mastitis

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Summary

Dry treatment of about one-half of a 60-cow herd with a neomycin and chlorobutanol compound over a three-year period reduced the number of positive California Mastitis Test (CMT) scores. This effect was greatest during the first ten days after calving. Streptococcal infections were reduced but not staphylococcal infections. Dry treatment with the antibiotic compound reduced the risk that a cow would be culled because of mastitis.

Introduction

The advantages of dry cow therapy were listed by Dodd, *et al.* (1), and the need for more efficacious data was pointed out in the report of the National Mastitis Research Committee (3). This study was designed to measure the long range effect of dry cow treatment in a commercial dairy herd. Post-milking teat dipping was practiced in the herd throughout the experiment.

Methods

From January 1971 through January 1974, the 60-cow Holstein herd at the Southern Indiana Purdue Agricultural Center was used in a dry treatment experiment. Milk samples, taken from all cows on the last day of the lactation, were cultured for bacteria. Each quarter was checked with the California Mastitis Test (CMT). The cows were milked dry and all quarters of alternate cows were treated with Biodry[5] according to label instructions. Cows treated at the end of the first lactation were also treated at the end of each subsequent lactation.

Milk samples for culture and CMT readings were taken on all cows within 48 hours after calving. Also, during 1971 and 1972, CMT readings were taken and results recorded each day for 10 days after calving. During all three years, monthly CMT readings were taken and recorded from all lactating cows.

Milk samples for bacterial culture taken just before drying the cow and within 48 hours after calving were drawn aseptically according to the procedure described by Fairbank, *et al.* (2). Milk samples were streaked on 10% sheep blood agar plates, incubated aerobically at 37C for 24-48 hours and examined for bacteria that are considered pathogenic for the bovine udder. Organisms designated as *Staphylococcus aureus* were catalase-positive, gram-positive cocci that produced α or β hemolysis on sheep blood agar and coagulated rabbit plasma. Streptococcal pathogens were screened as catalase-negative organisms with gram-positive streptococcal morphology. (On the basis of the Camp test those organisms which were positive and which did not utilize esculin were identified as *Streptococcus agalactiae* (4).

Results

CMT results for treated and control cows were summarized as follows: 1) fourth and later lactations, 2) second and third lactations, and 3) second lactations only.

There was a 10% difference between total positive control and treated quarters (57-47) and a 7% difference between CMT 2 and 3 positive quarters of control and treated (25-18). The most effective results occurred during the second and third lactation as shown by a 13% difference between positive control and treated quarters (59-46) and a 12% difference between CMT 2 and 3 positive quarters (31-19). CMT positive quarters were somewhat less (4%) in the fourth and later lactations.

During 1971 and 1972, CMT readings were taken each day for 10 days after calving to measure the influence of dry cow therapy at the start of the lactation. Each quarter was tested ten times.

The total treated cows freshened with 18% fewer positive CMTs (64-46) and 16% fewer CMT positive 2

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[5]Biodry is a product of TUCO Division of the Upjohn Company, Kalamazoo, Michigan, 49001, U.S.A. Each 10 ml contains: Neomycin Sulfate, 500 mg (equivalent to 350 mg neomycin base); Chlorobutanol Anhydrous (chloral deriv.), 50 mg in a special bland vehicle.

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Table 1: Monthly CMT lactation scores of control & dry treated cows - (3-year period).

Lactation No.		CMT Reactions Neg.	Pos. +	% Neg.	% Pos.	% 2&3s	Total Number Lactations Scored
4th & later	Control	594	828	42	58	25	38
(1971-1974)	Treated	456	528	46	54	21	27
2nd & 3rd	Control	190	270	41	59	31	13
(1972-1974)	Treated	493	424	54	46	19	26
2nd only	Control	63	37	63	37	12	3
(1973)	Treated	182	62	75	25	4	6
Total	Control	837	1135	43	57	25	54
	Treated	1131	1014	53	47	18	59

Table 2: Number of quarters with indicated CMT scores in first ten (10) days of lactation.

Lactation No.		CMT Reactions Neg.	Pos. +	% Neg.	% Pos.	% 2&3s	Total Number Lactations Scored
4th & later	Control	177	463	28	72	52	16
	Treated	198	282	41	59	42	12
2nd & 3rd	Control	183	137	57	43	29	8
	Treated	262	178	60	40	27	11
2nd only	Control	131	259	34	66	45	10
	Treated	390	270	59	41	21	17
Total	Control	491	859	36	64	45	34
	Treated	850	730	54	46	29	40

Table 3: Comparison of CMT scores at end of lactation and beginning of lactation over a three-year study (1971-1974).

	CMT Reactions Neg.	Pos. +	% Neg.	% Pos.	% 2&3s	Total Number Lactations Scored
Control, end of lactation	58	147	28	72	44	53
Control, beginning of lactation	55	153	26	74	52	53
Treated, end of lactation	89	169	34	66	43	65
Treated, beginning of lactation	108	148	42	58	41	65

and 3 reactions (45-29) than in non-treated controls. Those treated had fewer CMT positive quarters during the first 10 days of lactation.

The comparison of the CMT score at the completion of lactation with the one taken within 48 hours after calving is shown in Table 3.

The control cows and treated cows were turned dry with nearly the same percent of CMT positive 2 and 3 quarters (44 vs. 43); however, the control cows freshened with 11% more CMT positive 2 and 3 reactions (52-41) based on the CMT conducted within 48 hours after calving. The CMT positive 2 and 3s of the treated cows decreased at calving (43 vs. 41); there was an 8% increase in the CMT positive 2 and 3s in the control cows (52-44).

The treated cows were turned dry with 8% more *S. aureus* identified than the control group (22-14). They calved with a 3% increase in this pathogen. The streptococcal infections were 5% less (18-13). In the control cows, the percent of staphylococcal and streptococcal infections remained the same, before and after the dry period (14-14 and 20-18).

The failure of dry cow therapy with Biodry to reduce the *S. aureus* infections may be due to the presence of resistant strains of this pathogen at the beginning of the experiment (1). Sensitivity tests were not done with this product.

Further study of the disposition of the 27 control cows and 33 treated cows through June 1975, showed that six control cows remain in the herd while 11 of

the treated cows remained. Three control cows were culled for mastitis and one cow from the treated group was culled for mastitis. Conclusions:

1. Cows treated with Biodry had a reduced number of positive CMT scores.
2. Cows dry treated with Biodry had lower CMT scores immeidately after freshening than later in the lactation.
3. Cows dry treated with Biodry had lower incidence of streptococcal infections but this was not true with staphylococcal infections.
4. Only one cow treated with Biodry was culled because of mastitis while three of the control animals were culled because of mastitis.

Table 4: Quarters containing non-pathogenic and pathogenic bacteria at end of lactation and beginning of lactation.

	% No Growth	% Non-Path.	% Strep.	% Staph.	Total Number Lactations Scored
Control, end of lactation	30	36	20	14	53
Control, beginning of lactation	48	19	18	14	53
Treated, end lactation	25	36	18	22	65
Treated, beginning of lactation	47	14	13	25	65

Conclusions

The effectiveness of infusing the dairy cow udder at the end of a lactation period with drugs and antibiotics to control and/or prevent mastitis has been observed for some time. The data contained in this paper were collected over a three-year period on the 60-cow herd located on the Southern Indiana Purdue Agriculture Center.

One-half of the cows were infused with Biodry (Upjohn Company) at drying off. The rest of the herd remained as controls. The CMT (California Mastitis Test) and laboratory culture of milk samples were used to indicate quarters and udders of cows with mastitis.

The data for the three year period indicate that it is efficacious to "dry treat" dairy cows to control and/or prevent mastitis.

References

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FDA Memo

Importing New Animal Drugs

The Bureau of Veterinary Medicine has become aware of importations of new animal drug substances by veterinarians for compounding prescriptions in their private practice.

The bureau recognizes that a veterinarian may prescribe and administer to his patients whatever drugs he may legally obtain. This constitutes the practice of veterinary medicine which is subject to state laws and not under Food and Drug Administration regulation. However, new animal drug substances for which there are no provisions for importation or distribution under a New Animal Drug Application (NADA) or Investigational New Animal Drug Application (INADA) do not fall into this category.

A new animal drug, as defined in the Federal Food, Drug and Cosmetic Act, is one which is not generally recognized by experts as safe and effective for the conditions described on its label. FDA must approve a new animal drug as safe and effective for its intended use, based on data submitted by the manufacturer, before the drug can be legally marketed in interstate commerce.

New animal drug substances may be imported only if the importer is:

(a) the holder of an approved NADA for the imported new animal drug substance; or,

(b) the sponsor or investigator named in an INADA for the imported drug substance; or,

(c) the investigator conducting tests *in vitro* and in laboratory research animals, with drugs which comply with pertinent federal regulations (21 CFR 511.1 (a)); or,

(d) a distributor having an order from a consignee holding the appropriate NADA or INADA.

FDA intends to take appropriate action to prevent importation of new animal drug substances if the importer does not meet one of these criteria. Field compliance officers will prevent illegal importation by detaining the drug substances at the port of entry. Veterinarians should be aware of these regulations when planning to import bulk drugs.

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