

EFFICACY OF EXTERNAL TEAT SEALANT, APPLIED ON PRE-CALVING COWS IN GRAZING SYSTEM

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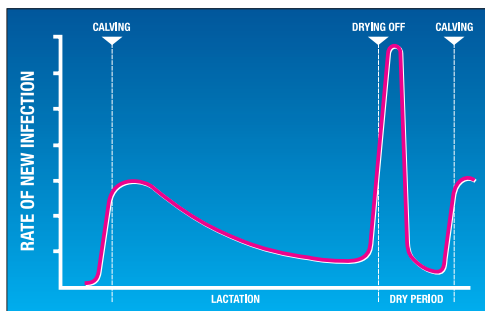
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INTRODUCTION

The epidemiological research of bovine mastitis has demonstrated that 30% to 50% of new intra-mammary infections (NIMI) occur during the dry cow period! The susceptibility of the mammary gland is greater during the beginning of this period (active involution period) and at the end (colostrum genesis), in which most of the NIMI are produced by major infectious and environmental pathogens, respectively (*Figure 1*).

Figure 1. Nearly half of intramammary infections originate during the dry period.



During the involution period, antibiotic therapy has been successful in reducing the rate of NIMI by approximately 50%. During the second half of the dry period a second antibiotic therapy, generally intravenous¹, and more recently a teat sealant for dry cows² have been tested. In Argentina, intensification of milk production systems has lead to an increase in post-partum NIMI rate and clinical mastitis due to environmental pathogens, especially *Streptococcus Uberis*, *Strep. Dysgalactiae* and *Coliforms*³.

The objective of this study was to evaluate the persistence and effectiveness of a teat sealant (DryFlex™/Stronghold®)* applied in pre-partum dairy cows in a grazing system.

*Marketed in the U.S. as Stronghold® and marketed globally as DryFlex™ by DeLaval.

MATERIAL AND METHODS

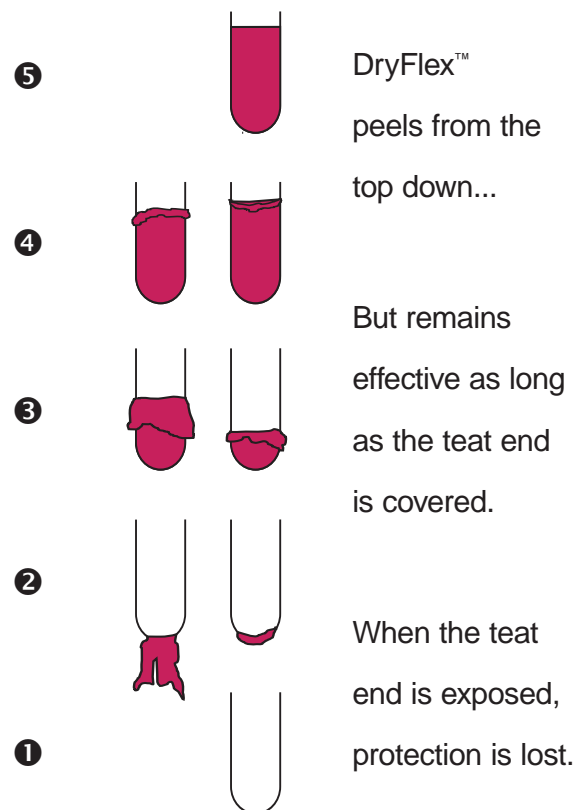
Test 1: Evaluation of the persistence of the teat sealant on adult pre-partum Holstein cows in grazing conditions.

- 17 cows evaluated.
- First application 10–12 days before the estimated calving date.
- Each teat was qualified according to the visual scales shown at right (*Figure 2*). Note that values 2 through 5 provide equal and complete protection to the teat orifice.

Application recommendations

1. Clean any soil/manure off teats.
2. Thoroughly clean teats with alcohol pads. Allow drying.
3. Infuse antibiotics according to standard routine (at dry-off only).
4. Re-clean the teats with alcohol pads. Allow to dry thoroughly.
5. Apply DryFlex as high up on the teat as possible. DryFlex dries within 2-3 minutes.

Figure 2.



Test 2: Evaluation of the effect of DryFlex application on the prevalence of clinical mastitis, bacteria aetiology and evolution of the SCC/mL.

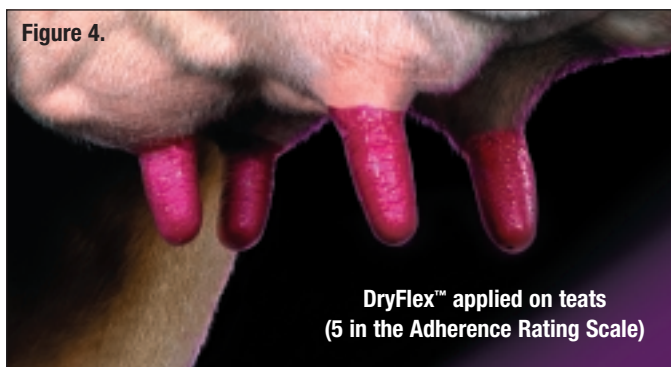
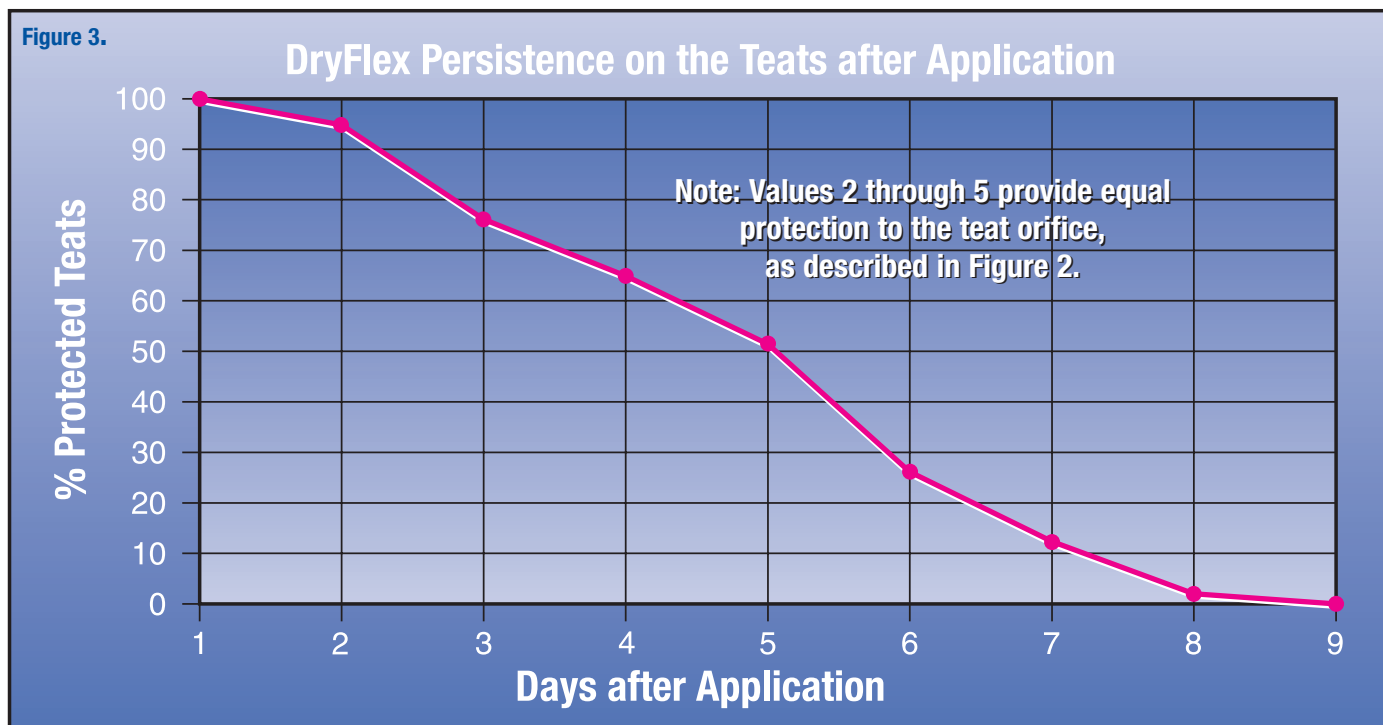
- 108 Holstein cows and heifers, paired by number of lactation, their calving date and with incidence of clinical mastitis in the previous lactation. Randomly assigned to a Treatment Group (T, n=49) or a Control Group (C, n=54).
- All adult cows dried off at the end of lactation and infused with Mamyzin S (Boehringer Ingelheim). This product contains per mL 20 mg of Penetamate Yodhidrate, 56 mg of Benetamin Penicillin and 20 mg of Framicetin Sulfate. Each quarter injection syringe contains 5 mL.
- DryFlex application began 7 days before the estimated calving date. Cows were checked every 4–5 days. Teats that lost the film completely were treated with the product again.
- Experiment conducted during a period of abnormally high rainfall (11 inches in 2 months), mud and flooding.

- Animals in both groups were properly identified and equally handled in feeding and milking.
- When milking, cows were forestripped, and pre- and post-dipped with a 0.25% iodine teat dip (Della-Pro™, DeLaval Inc).

Clinical mastitis cases registered and analyzed following the IDF recommendation.⁴ Samples for SCC were taken during the milk control on a monthly basis. SCC determination was made with Fossomatic (Foss Electric, Denmark) according to the FIL.IDF 148 A: 95 norm. Chi square test was used for analysis of clinical mastitis cases, according to type of bacteria. The SCC/mL was analyzed according to Student's T test and analysis variance by using The Statistix, Version 3.5 software (Analytical Software, St. Paul, Minn., U.S.A.) & BMPD (Statistical Software, Los Angeles, Calif., U.S.A.).

RESULTS AND DISCUSSION

Test 1: Persistence of teat end covering between days 4 and 5 after application was 50%, which is consistent with other reported results⁵ (Figure 3). If the teats at the time of application were clean and dry, intense rainfall or muddiness (Figure 4) did not affect the adherence.



Test 2: Pre-partum application of DryFlex was shown to reduce SCC and new cases of clinical mastitis during the first 45 days post-partum. SCC was reduced at 14 days post-partum and significantly reduced, by up to 66%, at day 45 (Figure 5, on following page). NIMI was significantly reduced for DryFlex-treated cows compared to the controls. It was especially effective against Environmental *Streps.* and *Coliforms*. No differences were observed in the cases of clinical mastitis produced by

Staphylococcus aureus.

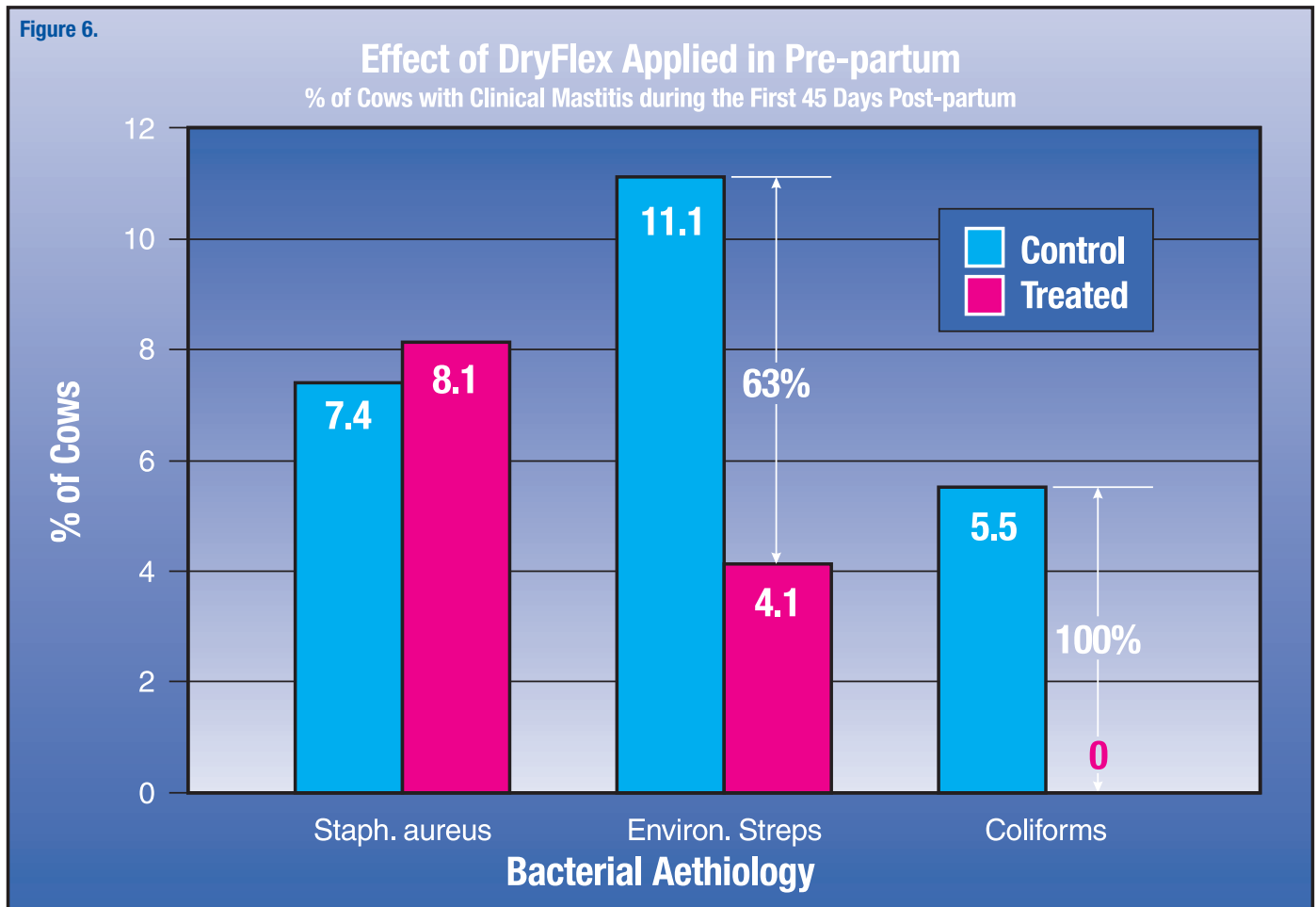
Previous results have shown that DryFlex is effective at reducing dry period NIMI when used in combination with a dry cow antibiotic and applied at dry off and pre-partum.² The current study shows a

strong benefit of the external teat sealant when applied pre-partum only (Figure 6, at bottom of this page). It is expected that the concentration of dry cow antibiotic in the gland would be below the MIC during the pre-partum period and the udder would be at its most susceptible state.

Figure 5. Effect of DryFlex applied in pre-partum – SCC/mL on days 14 and 45 after calving

Exp. Group	SCC/mL x 1000(Average)	
	14 days +-1	45 days +-1
Control (n=54)	419.2 ^{aa} +-162.9	367.2 ^A +-132.9
Treated (n=49)	328.1 ^{bb} +-98.6	123.9 ^B +-24.5
Reduction (SCC/mL)	91,000	243,000
Reduction (%)	19.80	66.25

^{a,b}—significantly different p<0.05 Chi Square; ^{aa,bb}—significantly different p<0.1 T test; ^{A,B}—significantly different p<0.01 T test



CONCLUSIONS

- DryFlex blocked the teat orifice for 5 days in 50% of the cases.
- DryFlex provided protection during the dry period and resulted in a 50% reduction in the prevalence of clinical mastitis produced by environmental pathogens (*Environmental Streps.* and *Coliforms*) and 100K average reduction in Somatic Cell count in cows treated with DryFlex, evaluated during the first 45 days post-partum.
- DryFlex is shown to provide protection during the dry period and results in improved udder health during the next lactation.
- There is a clear economic benefit for dairy producers due to reduced cases of clinical mastitis, reduction in expenses in antibiotics, reduced amount of rejected milk and less work for the milkers.

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