

Comparative efficacy of two internal teat sealants on 3 New Zealand dairy farms

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Objectives: Internal teat sealants (ITS) infused at the end of lactation have been shown to reduce the risk of new intramammary infections (IMI) over the dry period and the risk of clinical mastitis both during the dry period and early in the subsequent lactation. The objectives of this study were to demonstrate clinical noninferiority between two internal teat sealants NoroSeal (also known as SureSeal; Norbrook Laboratories) and Teatseal (Zoetis) in cows treated at the end of lactation for: i) incidence of new intramammary infections over the non-lactating period; ii) incidence of clinical mastitis over the non-lactating period; and iii) incidence of clinical mastitis over the first 30 days post-calving.

Methods: Cows (n=465) from 3 spring-calving Waikato herds were enrolled. Within each herd, cows were ranked by maximum SCC for herd tests in the preceding lactation and randomly assigned within sequential pairs of cows to be infused with NoroSeal (group N) or Teatseal (group T) in all 4 glands following final milking. Cows with a maximum SCC of >200,000 SCC/mL and/or a history of treatment for clinical mastitis had a long-acting 600 mg cloxacillin benzathine intramammary (Noroclox DC 600) infused into each gland before the ITS was infused. Duplicate milk samples were collected from all enrolled quarters for microbiology after the final milking of lactation and again between 0 and 5 days after the subsequent calving. The presence of any clots in the milk was recorded at these times. Quarters of all cows were assessed at approximately fortnightly intervals for six weeks after drying off. Quarters with clinical mastitis had duplicate milk samples collected for culture and the quarter was treated with a lactating cow intramammary antibiotic. Duplicate milk samples were collected from all 4 glands from any cow detected with clinical mastitis within 30 days of calving for bacteriological culture. New IMI was modelled with a GEE with herd, group (N or T), and dry cow therapy treatment (yes or no) as fixed effects. Survival analyses were used to assess the hazards of clinical mastitis. A generalised linear model was used to assess the effect of ITS group on the Log SCC of the first production recording of the subsequent lactation.

Results: Intramammary infection was present in 787 of 1,801 quarters (43.7%) at the end of lactation and 262 of 1,813 quarters (14.5%) post-partum. A total of 152 of 1,768 glands acquired a new IMI over the non-lactation period.

In the final multivariable models there was no difference in incidence of new IMI with any pathogen between teat sealant groups (0.067 (95% CI = 0.050-0.088) vs 0.059 (95% CI = 0.043-0.079) for glands in group N versus group T, respectively; $p=0.44$), incidence of new IMI with environmental bacteria (predominantly Streptococci) between teat sealant groups (0.006 (95%CI = 0.002-0.014) vs. 0.012 (95%CI = 0.006-0.023) for glands in group N versus group T, respectively; $p=0.14$), or incidence of clinical mastitis over the first 42 days of the non-lactating period between teat sealant treatment groups (6/904 (0.66%) vs 2/916 (0.22%) for glands in group N versus group T, respectively; $p=0.15$). There was no statistical difference in individual SCC at the first herd test of the lactation between the two treatments (93 (47-148) versus 80 (35-182) geometric mean (95% CI) SCC ($\times 1,000$ cells/mL) for cows in group N versus group T, respectively; $p=0.78$). Fewer group N glands developed clinical mastitis in the first 30 days of lactation than Group T glands (Hazard ratio (95% CI) = 0.3 (0.14-0.66); $p=0.003$).

Conclusions: The results reported here indicate NoroSeal is clinically non-inferior to Teatseal for: i) prevention of new intramammary infections; ii) prevention of new intramammary infections caused specifically by environmental mastitis over the dry period; and iii) prevention of clinical mastitis over the dry period, and that NoroSeal was more effective in decreasing clinical mastitis in the first 30 days following calving.

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