

What's Lurking on the Teat Ends of Your Cows?
Kayla Stomack, B.S and Ronald J. Erskine, D.V.M, Ph.D.
Department of Large Animal Clinical Sciences
College of Veterinary Medicine
Michigan State University



Anything inserted into a teat, including the cannula on an antibiotic tube for mastitis therapy, has the potential to bring bacteria and other microbes “along for the ride.” This forced entry may lead to new infections; the teat end is the most important defense to keep bacteria out of the udder. Thus, proper teat cleaning before infusing is a simple yet critical technique in order to reduce new cases of mastitis.

Most commercial mastitis tubes have a supply of alcohol pads packaged with their products. Unfortunately, the size of the alcohol pad is small (usually less than 2×2 inches), and many dairy managers and employees admit to not using them because:

1. the foil packaging is difficult to open,
2. wipes need to be unfolded,
3. the amount of alcohol in the pads is marginal, and
4. subsequent cleaning of the teat end is perceived to be poor.

In an attempt to facilitate more consistent teat end cleaning, herd managers should consider the use of larger, easier-to-use alcohol products such as commercial baby wipes, or alcohol-soaked cotton.

We performed a pilot study to determine the effect of cleaning on bacterial populations on the skin about the teat ends of milking cows. Three methods of teat end cleaning were compared:

1. teat ends that were not cleaned,
2. teat ends were prepared with alcohol pads supplied by the mastitis tube manufacturers, or
3. a commercial alcohol wipe (WipeOut®, ImmuCell, Portland, ME) that also includes the bacteriocide, nisin. These wipes are supplied in a pail for easy individual dispensing and are considerable larger (approximately 8×8 inches) than typical alcohol pads.

Opposite teats for each cow on the trial were randomly assigned to one of the three cleaning regimens, with 24 teats assigned for each cleaning regimen. Immediately after the milking unit was detached from the cow (to simulate the time when a cow might be infused with a lactating or dry cow tube), a culture swab was rubbed across the teat sphincter for 5 seconds then transported back to the laboratory.

Each swab was vortexed in 1 mL of sterile saline for two x 5-second pulses and then a 10 µL loop of the solution was cultured onto a blood plate.

The plates were incubated for 48 hours at 37° C. Colony counts and preliminary bacterial identification were performed and the counts of each type of bacteria (when applicable) were converted to cfu/mL of the saline. Geometric averages (after conversion to log₁₀) were calculated.

The results are displayed in Table 1. Bacterial growth was isolated from 46%, 29%, and 21% of the teat ends that were not cleaned, cleaned with alcohol pads, and cleaned with WipeOut® wipes, respectively.

Although the number of colonies isolated from teat ends did not differ between the two alcohol preparation methods, ten times the number of bacteria were isolated, on average, from teats that were not cleaned. Thus, alcohol cleaning reduced the frequency and numbers of bacteria on teat ends.

Table 1- Results of bacterial isolation from teat ends after milking

Teat End Preparation	Number of Positive Isolations (%)	Geometric Mean cfu/mL
No cleaning n=24	11 (45.8)	34.5
Alcohol Pad n=24	7 (29.2)	4.6
Wipe Out® n=24	5 (20.8)	3.6

Mastitis is a multifactorial disease, and there are numerous management practices that a herd can employ to help decrease the risk of new infections. Reducing the entry of bacteria into the gland during intramammary therapy from poor infusion technique can play a role in reducing new infections.

For example, partial insertion of cannulas during dry cow therapy reduces the risk clinical mastitis during the dry period and lowers bulk tank somatic cell counts in the subsequent lactation (McDougall, 2003). Intramammary infusion of drugs from multi-dose vials (such as bottles of penicillin) or improper cleaning of teat ends before dry off has been implicated in a higher prevalence of mastitis from unusual organisms such as *Prototheca* (Pieper et al, 2012). In our survey from over 600 dairy herds, 79% of herds reported always cleaning teat ends before infusions. Thus, 20% of herds do not practice consistent teat end cleaning and the actual percentage may be higher given the practical reality on many dairy farms

Cleaning teat ends before infusions is a common sense, simple approach to prevent bacterial entry into the gland. Some of the reasons for non-compliance on farms could be lack of education as to the importance of the teat end as the major barrier to new infections, the false sense of security that the presence of the infused antibiotic in the udder would prevent any microbes from establishing an infection, and, perhaps most importantly, the inconvenience of the alcohol pads supplied with commercially available mastitis tubes. Human nature dictates that if a task is made easier, it is more likely to be done.

Herd managers are encouraged to facilitate the cleaning of teat ends so that it is done every time before any cannulas are inserted through the teat canal.

References

McDougall S. 2013, *New Zealand Vet J*, 51:2, 63-72, DOI: 10.1080/00480169.2003.36342
Pieper L, et al., 2012, *J Dairy Sci*, 95:5635-44.