Is stripping a way to control mastitis?

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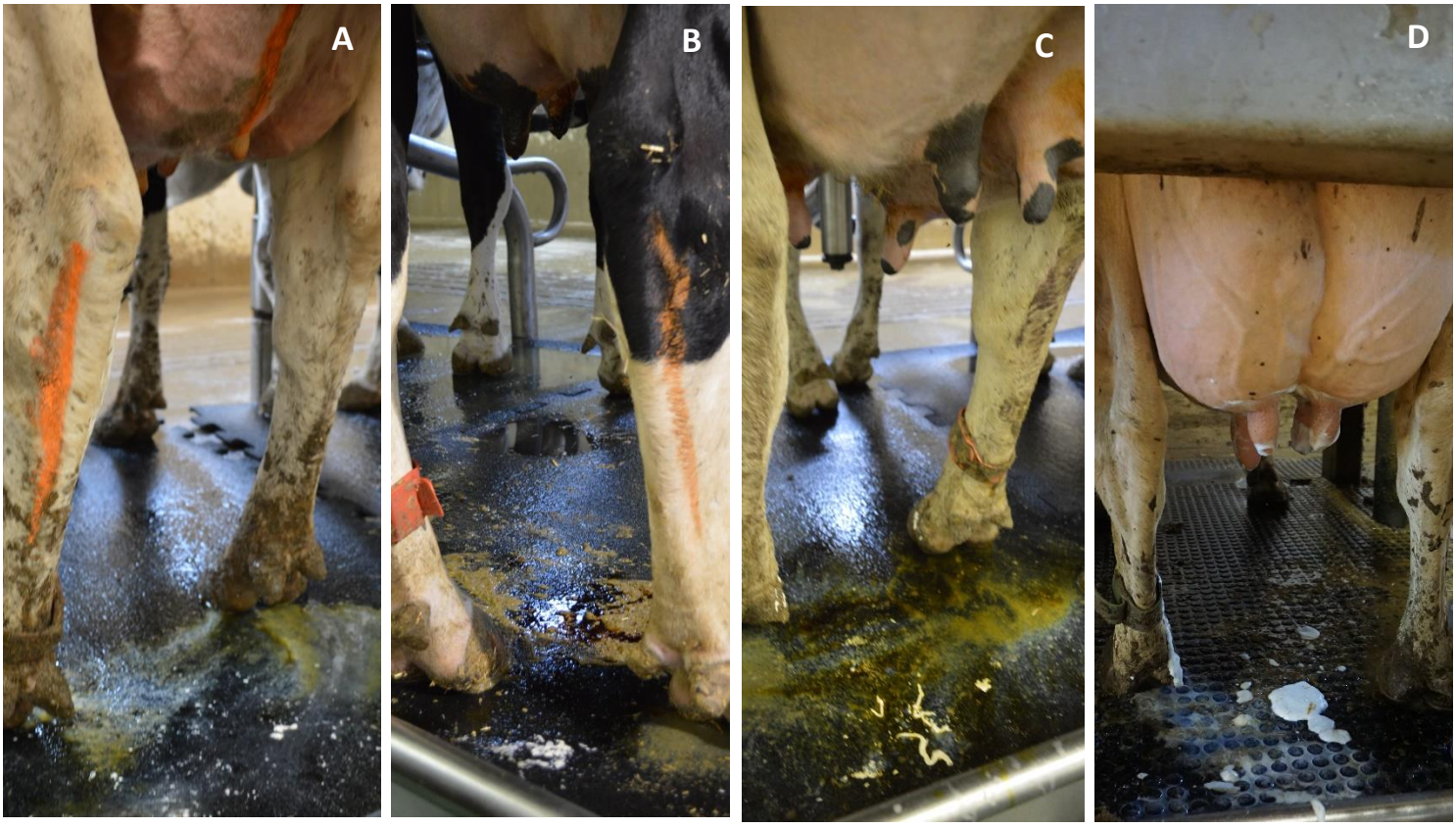
Stripping is the action of hand strip the first three to five streams of milk prior to milking unit attachment, and it is a recommended and important step for most milking routines. Stripping serves a multitude of purposes: 1) stimulates milk let-down; 2) flushes bacteria from the teat canal; 3), and detects milk abnormalities (i.e. watery milk, flakes, clots; Picture 1 – A, B, C), which is useful to discover early stages of clinical mastitis.). It is known that many dairies adopted a common procedure of stripping directly onto the floor as an alternative to the strip cup; however, we should not be stripping on floors to avoid spreading pathogens. Also, when using white teat foaming as a pre-dip (Picture 1 D) followed by stripping this procedure jeopardizes your ability to observe the milk abnormalities.



<u>Picture 1</u>. Example of abnormal milk found (A, B and C) and dipping foam that could be confuse with abnormal milk (D).

But how to perform a strip cup test? This simple cow side test can be done at milking time (before unit attachment) just by pouring some milk from each one of the quarters separately to a cup with a black screen to easy and clear visualization of milk clots (Picture 2; plastic strip cup costs around US$15).

<u>Picture 2</u>. Example of plastic strip cup to be used in dairy animals for identify abnormal milk.

Once clinical mastitis is detected, we often hear the recommendation of milking out or frequent stripping of the affected quarter. In women, when lactational mastitis occurs, the doctors recommend stripping out milk every 2 to 4 hours to prevent the formation of breast abscess. In dairy species, veterinarians may recommend stripping the affected quarter several times a day. The thought behind is that it will help removing bacteria, milk clots, debris, and also toxins that might be released by the bacteria from the affected gland. Also, the frequent striping of the affected quarter will enhance milk let down due to oxytocin stimulation, and hence the milk retained in the small and large ducts will be drained out of the gland.

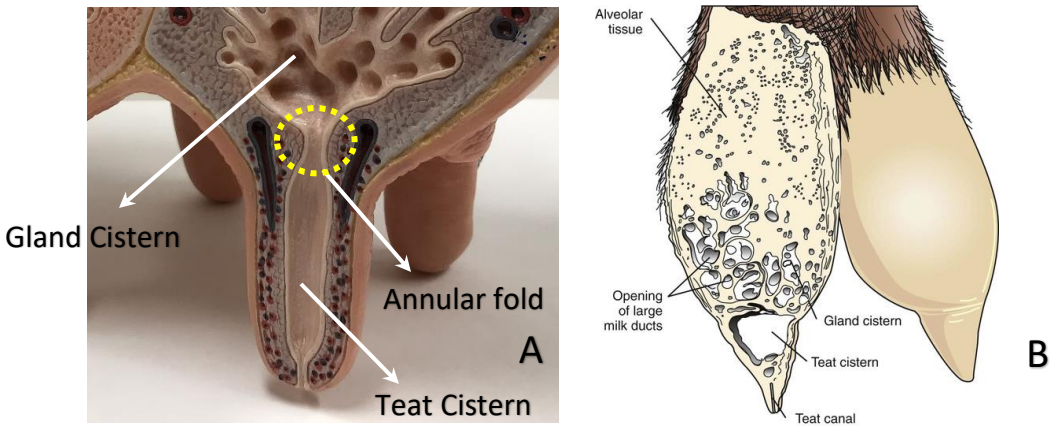
This method of treatment has been around for decades but until now, we do not have a clear idea whether: 1) this practice is useful during mastitis treatment and 2) how many strips are needed to be effective. In addition, it can be labor intensive and of course involve labor costs.

Although there are several studies comparing treatment efficacy between the use of different antibiotics, to our knowledge only a few studies have compared stripping to any other form of treatment. In the literature, a combination of intramammary antibiotic therapy and continuous striping may be more beneficial than either method alone. Roberson et al. (2004), found stripping to be detrimental against environmental streptococci when used as the only resource (resource available on https://www.sciencedirect.com/science/article/pii/S0022030204732002).

Stripping and good practice also involves knowledge, it is also beneficial to know which pathogen was found to be the cause of mastitis. Remember, those contagious organisms as *Staphylococcus aureus* can be passed from cow to cow by milker's hands. An emphasis on maintaining a clean, dry environment and udder hygiene at treatment time as well are key.

Stripping in Dairy Small Ruminants

Interestingly in many countries, the milking routine does not include stripping. The reason is related to the anatomy of the mammary gland. The mammary gland in most of the dairy species has a structure called annular fold or cricoid rings which narrows the passage from the gland cistern to the teat cistern (Picture 3). Sheep and goats "wider" annular fold allows the milk to pass freely between gland cistern and teat cistern. The other particularity of the small ruminant mammary gland is their capacity of holding more milk within their gland cisterns which is the double or more compared to dairy cows. Thereby, there is no need to strip milk out of sheep and goats before attaching the milking unities to: 1) stimulate early milk let down and 2) check for mastitis. The annual incidence of clinical mastitis is generally lower than 5% in small dairy ruminants.



Picture 3. Comparison of the internal structure and in detail the annular fold of dairy cow quarter (A) with a left mammary gland of a goat (B) showing the gland cistern, the teat cistern, and the teat canal.

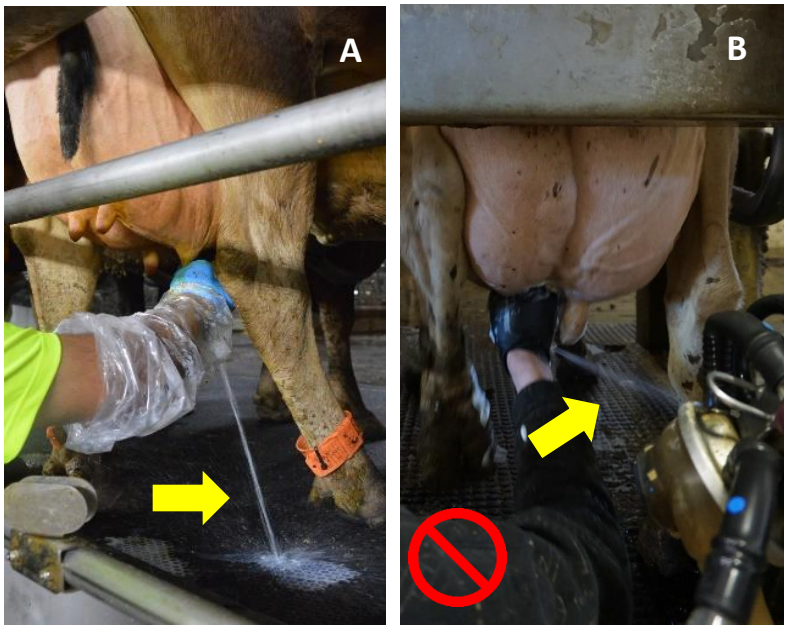
(Goat illustration from Cowie AT: Lactation. In Austin CR, Short RV, editors: *Reproduction in mammals,* ed 2, vol 3, Hormonal control of reproduction, Cambridge, UK, 1984, Cambridge University Press.)

We must remember that there are no specific antibiotics for treatment of mastitis labeled to be used in sheep or goats. In other words, treatment of mastitis in those species is extra-label ("drug used in a way or for a purpose not specified on the label") and as a result must be done under the supervision of a veterinarian.

Recommendations for a successful mastitis treatment:

1) Do a strip cup test routinely to identify the cases of mastitis at an early stage. By doing that you increase the treatment success for this disease.
2) Stripping not only can be used to identify cases but also to treat cases of mastitis in specific cases.
3) If cows are under antibiotic treatment you probably can reduce the stripping times or completely avoid it when milking the glands out. Once treatment period is complete, stripping and CMT (California Mastitis Test) will be useful to check drug effectiveness.

4) Record keeping with special attention on the order of sick cows to be stripped (cows positive with contagious pathogens can be spreading these organisms to other cows).
5) Caution on disinfection, cleanliness on performing this simple practice - use of clean gloves could be beneficial to prevent the spread of mastitis organisms.
6) Strip cups and floor should be cleaned and sanitized after each milking.
7) Record the necessary information for all days of treatment: i.e. drugs used, start of treatment day, result of stripping and/or CMT.
8) Perform stripping correctly avoiding spreading the milk skirts in other directions than the strip cup or floor (if using strip cups is not possible; Picture 4).



Picture 4. Stripping performance: correct (A) and incorrect (B).

How do you perform stripping? Share your thoughts/techniques/tricks with us! Are you interested in knowing an specific topic? Contact us at (Spanish, Portuguese and English): Maristela Rovai: maristela.rovai@sdstate.edu and Luciana da Costa: da-costa.2@osu.edu