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Department of Veterinary Preventive Medicine

Research

Ramey, D. W., & Kinde, H. (2014). **Commercial and Homemade Extremely Dilute Hypochlorous Acid Solutions are Bactericidal against *S. aureus* and *E. coli* in Vitro.** *Journal of Equine Veterinary Science*. Advance online publication. doi: 10.1016/j.jevs.2014.12.004

BACKGROUND: In human medicine, hypochlorite solutions diluted in water or saline have been used for vaginal, bladder and urethral irrigations, control of athlete's foot, and as infection prophylaxis in the management of burns. Countless topical agents have been used in an effort to prevent wound infection and decrease surface contamination. Unfortunately, the majority of such preparations may be locally toxic, and have limited to no proven effectiveness in enhancing wound healing.

PURPOSE: The first objective was to evaluate the antibacterial effect of a low concentration of hypochlorous acid solution (HCIO - 0.011%) against two common bacteria, *E. coli* and *S. aureus*, *in vitro*. The second objective was to compare the commercial product to that of a homemade solution (HCIO - 0.012%).

RESULTS: All trials had bacterial growth present in control samples. Trial 1 (commercial solution), no growth of bacteria was seen in test solutions after 24 and 48 hours incubation. Trial 2 (commercial solution), no growth of *E. coli* was seen at 500 or 1,000 µL. No growth of *S. aureus* was seen at 1,000 µL but growth was present at 500 µL. Trial 3 (homemade solution), no growth of either bacteria was seen at 500 or 1,000 µL.

CONCLUSIONS: This study showed that single samples of extremely dilute solutions of HCIO are bactericidal *in vitro* for two common equine pathogens. Given the low cost and easy availability of ingredients, as well as myriad uses in human medicine, it would seem that there are ample reasons for investigation of the use of such extremely dilute solutions of hypochlorous acid in equine medicine, including, but not limited to, areas such as in wound care, dentistry, and in the treatment of endometritis. Investigations into safety issues pertaining to such solutions, for example, potential cytotoxicity, should be performed, as well.

[ACCESS THE ARTICLE...](#)

Enger, B. D., Fox, L. K., Gay, J. M., & Johnson, K. A. (2014). **Reduction of teat skin mastitis pathogen loads: Differences between strains,**

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dips, and contact times. *Journal of Dairy Science.* Advance online publication. doi: 10.3168/jds.2014-8622

BACKGROUND: A teat dip's effectiveness is not simply dependent upon the concentration of the active ingredient. Longer premilking teat dip contact time with the teat skin potentially could result in reduced milking parlor efficiency as measured by cow throughput. No empirical evidence supports the recommendation that a 30-second contact time is optimum when considering both pathogen load reduction and milking parlor efficiency.

PURPOSE: The first experiment was designed to determine if strains within species differed in their germicidal sensitivity to disinfectant formulations of four commercially available postmilking teat dips using the excised teat model. The objective of the second experiment was to determine if the often advocated premilking dip contact time of 30 seconds reduced a greater or equal number of noncontagious (environmental and opportunistic) mastitis pathogens than dip contact times of 15 or 45 seconds.

RESULTS: Experiment 1 results indicated significant differences in strain sensitivities to dips within pathogen species: *Staphylococcus aureus*, *Staphylococcus chromogenes*, and *Streptococcus uberis*. Species differences were also found where *Mycoplasma bovis* (97.9% log reduction) was the most sensitive to tested teat dips and *Staphylococcus haemolyticus* (71.4% log reduction) the most resistant. Experiment 2 results indicated that contact times of 30 and 45 seconds were equally effective in reducing recovered bacteria for dips T-505 and DellaCare Enhanced and were also significantly more effective than a 15-second contact time. No differences were seen in recovered bacteria between tested contact times after treatment with dip T-Prox.

CONCLUSIONS: The authors concluded that different mastitis pathogen species and strains within species may possess different sensitivities to teat dips, and it may be that dairy operations tailor their teat dipping program to counter the difference in strain sensitivities to dips. With respect to the 3 tested premilking teat dip contact times, it can be concluded that a 30-second contact time is optimal when using an iodophor and a 15-second contact time is optimal when utilizing a hydrogen peroxide dip. Reducing unnecessary premilking contact time may potentially increase parlor efficiency and therefore potentially increase the number of animals milked per hour.

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Zoche-Golob, V., Haverkamp, H., Paduch, J. H., Klocke, D., Zinke, C., Hoedemaker, M., ... Krömker, V. (2014). **Longitudinal study of the effects of teat condition on the risk of new intramammary infections in dairy cows.** *Journal of Dairy Science.* Advance online publication. doi: 10.3168/jds.2014-8446

BACKGROUND: Although reducing Intramammary infection (IMI) is crucial for improving udder health, an evidence-based association between teat condition and risk of new intramammary infections (NIMI) has not yet been established.

PURPOSE: The objective was to investigate possible associations between short-term and long-term changes in teat condition, infectious status, and naturally occurring NIMI with different pathogens and new inflammatory responses under field conditions in a longitudinal design.

RESULTS: No effect was observed on any variable describing teat condition on the risk of new intramammary infections, inflammatory responses, or mastitis. Intramammary infections of the same udder quarter in the preceding month did not affect risk either.

CONCLUSIONS: This study did not show associations between teat condition and risk of NIMI. In particular, whether teat condition is a specific risk factor for a certain group of pathogens remains unclear. Data suggests that if teat condition does influence the risk of NIMI, the effect would be small. Further longitudinal studies with shorter sampling intervals (1–2 weeks) are warranted to evaluate potential causal relationships between teat condition and NIMI. Based on a similar incidence as in this data set and risk ratios of

1.5, a minimum of 150 NIMI per pathogen would be required and it would be a challenge to implement such a study on a commercial farm.

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Calendar



A full calendar of all upcoming events and continuing education opportunities offered by the College of Veterinary Medicine is available on the website at <http://vet.osu.edu/>

[Ohio Dairy Health and Management Certificate Program](#)

Module 4 – Advanced Dairy Cattle Nutrition
March 19-21, 2015

[Ohio Dairy Veterinarians Meeting](#)

Precision Technologies in Dairy Production
January 8-10, 2015

The *Ohio Veterinary Newsletter* began in October of 1974 as a way for Veterinary Extension to relay relevant information to practicing veterinarians in Ohio. The aim is to communicate pertinent news from the Veterinary Extension Unit; unbiased, research-based information with practical relevance for veterinary practitioners working in food animal, equine, and shelter medicine; and a calendar of upcoming opportunities. Please feel free to provide your feedback and let us know what information is most helpful to you and your practice.

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