

Cows with hoof lesions spend less time eating

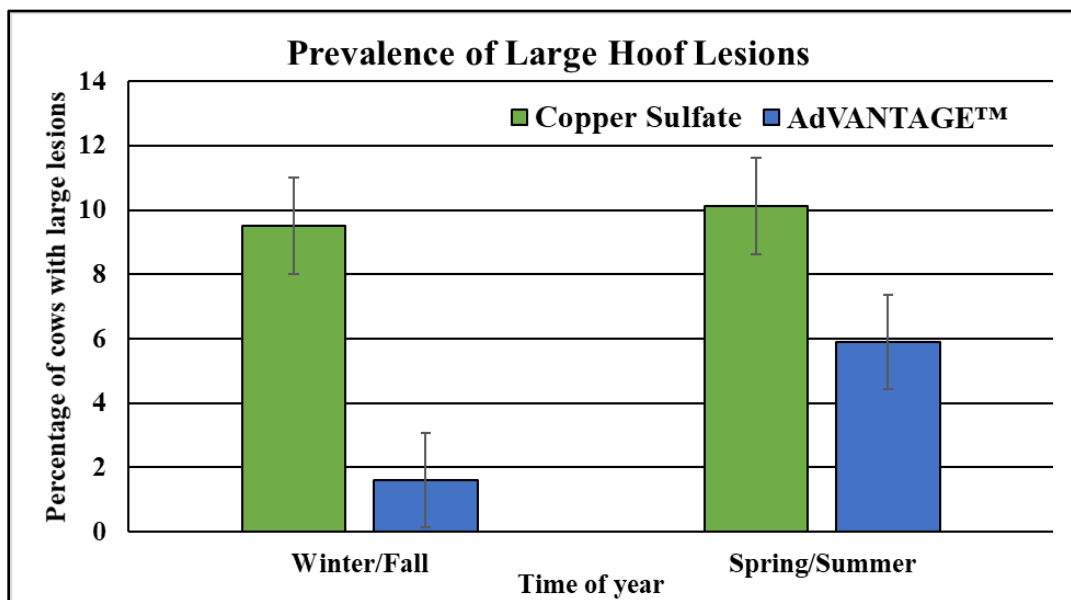
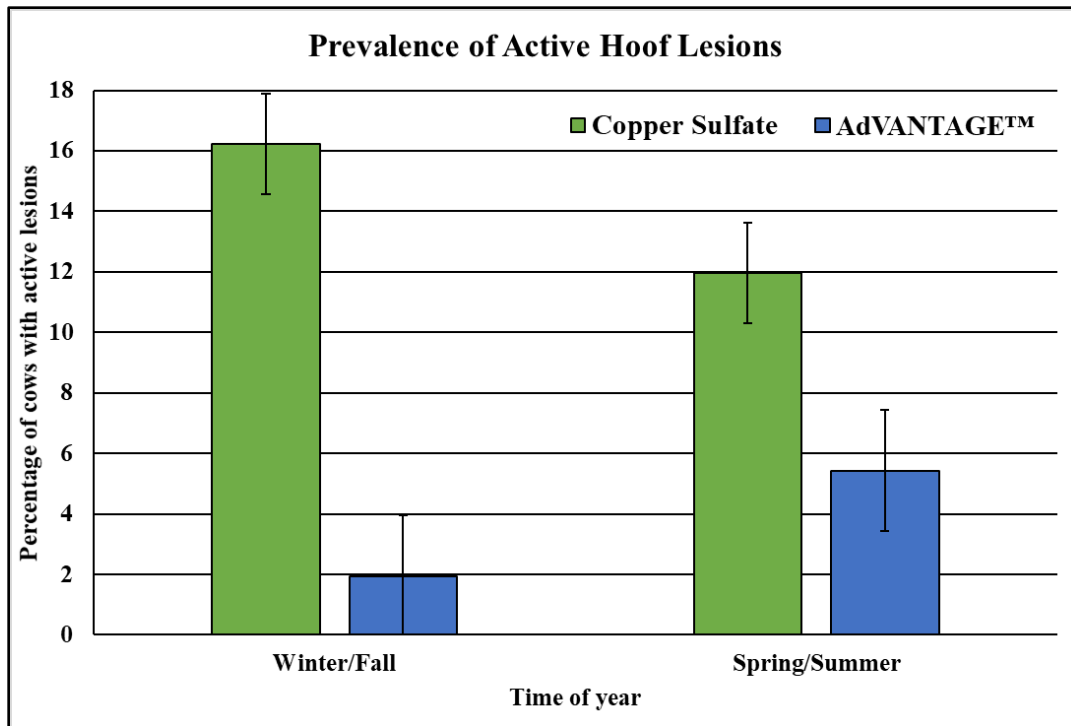
Do you know what causes about 50% of lameness cases in dairy cattle? Digital dermatitis. This disease is tricky to manage and can cause serious economic losses if not well managed. A little over two years ago, a group of farmers asked me to answer three questions for them: 1) how effective is an alternative footbath product that uses less copper?; 2) can estrus detection technologies help me identify cows with hoof lesions?; and 3) how do hoof lesions or warts affect cow feeding behavior? My research team and I recently completed a study that aimed to answer those questions. We learned a lot about a footbath product called AdVANTAGE™, a cow monitoring system called CowManager®, and cow behavior. We conducted this two-year-long study at the Washington State University Knott Dairy Center. The dairy milks, on average, 170 Holstein cows twice a day. I hope that by sharing what we learned, managing digital dermatitis will become easier on your farm.

Footbath products: using AdVANTAGE™ vs. copper sulfate

Because we traditionally use copper sulfate in our 50-gallon footbaths, we decided to test AdVANTAGE™ against copper sulfate. The products alternated every four months so that we used AdVANTAGE™ four months, then copper sulfate four months, and so forth. Copper sulfate footbaths started with 25 pounds of copper sulfate mixed with water, dumped after two milkings, and used three days a week. AdVANTAGE™ footbaths started with 12.5 pounds of Copper Plus (mix of copper sulfate and zinc sulfate) and 25 ounces of AdVANTAGE™ concentrate mixed with water. We maintained the AdVANTAGE™ footbaths at a pH < 5, dumped them after four milkings, and used them four days a week (set-up twice a week, but kept in place for four milkings before dumped). Once a month, we evaluated all cows' rear feet in the parlor for hoof lesions. We recorded whether a lesion or swelling was present, the lesion was active or digressing/regressing, and lesion size:

Approximate Lesion Size Diameter	Classification
< ¼ inch	Small
¼ inch – ½ inch	Medium
> ½ inch	Large

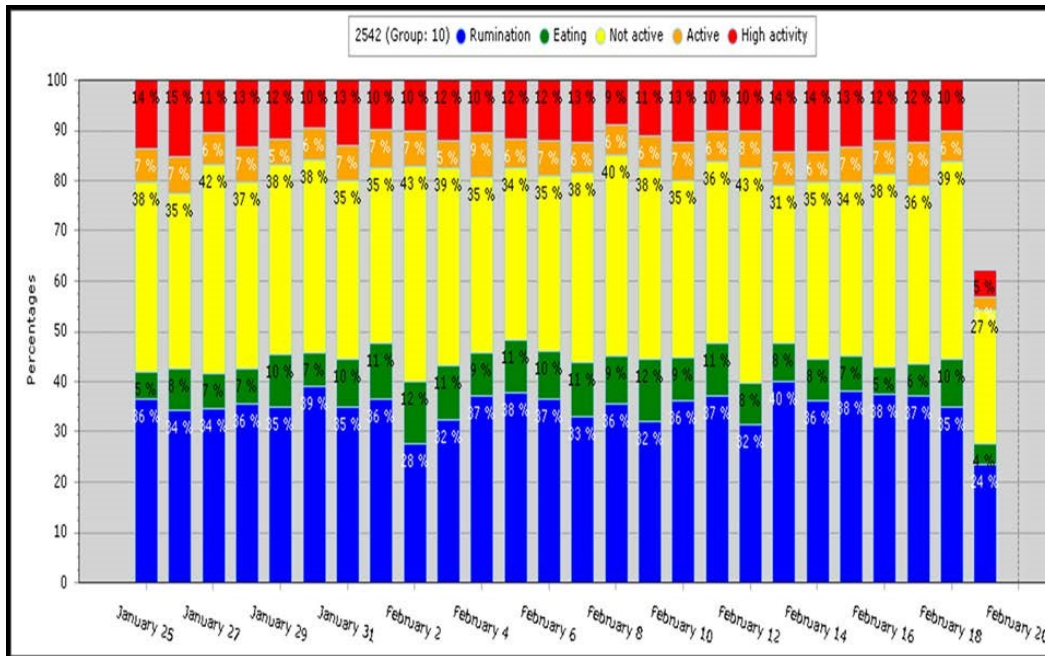
We focused on comparing the prevalence of hoof lesions and swollen feet for both products during the last month (4th month) of each four-month testing period. Overall, we had fewer cows with active lesions and fewer cows with large lesions when we used the AdVANTAGE™ product. We did not detect any differences in the percentage of cows with small or medium lesions between the two products.



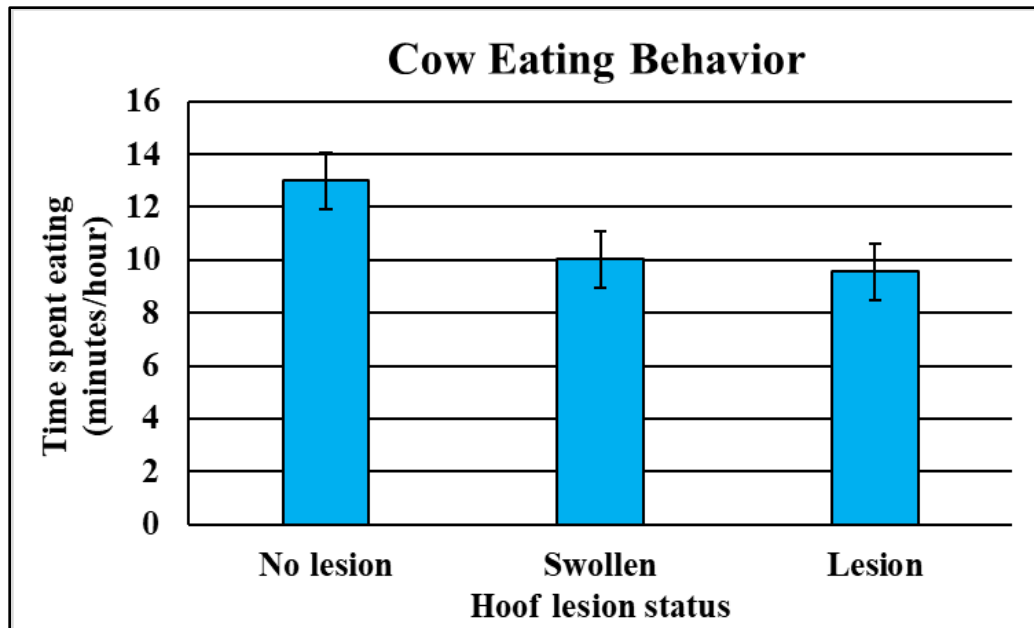
Hoof health and cow behavior: using CowManager®

We installed CowManager® ear tags on all our lactating cows. The cow behavior data collected by the system is very helpful for estrus detection and monitoring cow well-being. It is especially useful in helping our students identify changes in cow behavior. In case you are not familiar with the information provided by CowManager®, I included a snapshot of a behavior graph for one of our cows, 2542. The graph shows you how much time the cow spent ruminating, eating, not active, active, or highly active each day. My rule of thumb is that I would like to see all the

lactating cows spend about 20% of each day eating. As you can see from the graph, 2542 was not reaching this target, especially when she was only spending 5% of the day eating. We kept a close eye on her and monitored her health.



On every hoof evaluation day, we collected behavioral data for each cow so we could match hoof health (related to lesions and swollen feet) with cow behavior. Cows with no hoof lesions or swelling spent an average of 13 minutes every hour (22% of time) eating; whereas, cows that had a hoof lesion or swelling spent an average of 10 minutes every hour (17% of time) eating. Let us think about this from a daily standpoint. Cows without hoof lesions or swelling spent 72 minutes more eating every day than cows that had hoof lesions or swelling. That is over an hour of lost feeding time for cows with hoof lesions! It is interesting to note that the size of hoof lesions did not affect cow eating behavior in our study.



Another intriguing feature of the CowManager[®] system is that it also records each cow's ear temperature. The general thought is that as a cow's ear temperature decreases, the rectal temperature increases. We noticed in our study that cows with hoof lesions or swelling had ear temperatures (~ 69.8 °F) about 5° lower than cows without hoof lesions (~ 75.2 °F). The relationship between ear temperatures and hoof lesions is something that we plan to investigate in more depth.

Overall, we found answers to our questions but now have new questions to pursue. We learned that a footbath solution with lower concentrations of copper can be more effective than copper sulfate at managing large, active hoof lesions. We learned that estrus detection technologies that monitor cow behavior have the potential to identify cows with hoof lesions. We were surprised to learn that cows with hoof lesions spend 5% less time eating than cows without lesions and that lesion size did not affect eating behavior. Cows are prey animals that only show weakness when they have to. It is easier for us to identify cows with lameness than cows with small hoof lesions. Wouldn't it be nice if we could use technology to help us identify those small lesions earlier and provide care earlier? Just food for thought.

I hope we helped you answer some of your questions about hoof lesions. Feel free to contact me with any questions or comments. Happy farming!



Dr. Amber Adams Progar
Washington State University
Dairy Management Specialist
amber.adams-progar@wsu.edu