Episode 298 - Exploring Non-Antibiotic Mastitis Treatments: Research Insights and On-Farm Applications - UMN Extension's The Moos Room

00;00;12;01 - 00;00;55;26
Brad
Up! Welcome to The Moos Room, Brad. Again. Summertime. Everybody is out. Busy doing lots of research and extension programs. But alas, I am here again talking about a subject that's kind of been bothering me a little bit lately. And maybe it's a little bit about the environment, the weather, and that's mastitis. We've had some mastitis issues again, like we always do on our dairy, and it always seems to be more prevalent in the spring when we put cows out to pasture, or it rains a lot in May or June and, you know, do we do a good job of getting teats clean?

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Brad
There's lots of things that go into cows getting mastitis, but I wanted to talk a little bit about some research that we've been working on, looking at non antibiotic treatments for mastitis. And we've done some studies here at Minnesota. We're also going to talk about a study that was done in Colorado that I'm part of a team there.

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Brad
And just see what or where this might go. Looking at non antibiotic therapy. So in 2023 there was a study done looking at the direct cost of treating clinical mastitis among 37 Wisconsin dairy farms. Kind of the conclusion was that it appeared that dairy producers tended to over medicate cows diagnosed with non severe cases of clinical mastitis, which led to increased expense on the farm and loss of milk production.

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Brad
So this study was led by Pam Rugg, who's now at Michigan State University. And this study by a graduate student estimated that the direct treatment costs could be reduced by over $65 per mastitis case if farmers actually followed the treatment durations of the antibiotic that they were using. Now, that's a lot of money. If you have a lot of cases of mastitis in your herd, but $65 per case, that's a lot and probably a lot of it comes from loss of milk production.

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Brad
The cost basically of mastitis in the dairy industry in the United States is about $110 per cow,

per year, and this is typically on the rise. It's been increasing a lot. And there's always the concern that, like the study said, that farmers may be over medicating cows. We are guilty of it at our research center as well. I know sometimes it's like whole.

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Brad
We just see a little bit of a clot in a cow, and we're running for drugs immediately to take care of it when that cow probably doesn't need it. It's just one little flare up at one little milking. But yet we have to think that we have to treat it immediately to take care of it. And that's probably not the case at all.

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Brad
And we'll get into a little bit about using antibiotics for some dry cow treatments. And we've done some studies here at, at our dairy in Morris using non antibiotic treatments for dry cows. But if you think about it from a cost. So we looked at these same herds. The cost of treatments at dry off was about $19.57 per cow, which is also in my mind.

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Brad
That's quite significant. That's a lot of money per cow for dry treating. The study also showed that if you use selective dry cow therapy, which we've talked about before on our podcast, you could save about $5 per cow if you just use selective dry cow therapy. But the biggest conclusion of that study was if you use selective dry cow therapy, antibiotic use at dry off could have been reduced by 51%.

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Brad
Now that's a lot 50% reduction in antibiotic use. I'll take that any day. So let's talk about some of the studies that we've been working with with some non antibiotic treatment at our research herd. So it's probably been a couple of years I got interested in a non antibiotic product from Italy. I saw it online. It's been in hoards dairymen and a few other places in some trade magazines.

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Brad
So I reached out to the company I was interested in it just to see what would happen, because obviously I've been frustrated with people running for antibiotics. The minute cows get one little speck of mastitis. So what is the product? Well, it's called ozone amassed. And we've been doing some research with it and testing with it for the last year and a half or so.

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Brad
But it's a non antibiotic. It's a no withdrawal. So there's no withdrawal. And a non-prescription tool to help reduce mastitis. Or it could be used at dry off. So basically it it's kind of corn germ oil. And it helps support tissue functionality when it's not really severely compromised yet. So if you have a full blown E coli mass diet s watery mastitis, this product will not fix that X that there's not a lot of products that will fix to a full blown E coli mastitis.

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Brad
We just had one cow at our research center get an E coli mastitis, and she went from 60 pounds of milk to 0 pounds of milk, aborted a calf, and now she's probably going to end up being cold because of of this. You want to use it at the very first signs of tissue unbalance. We don't really want to wait for clear symptoms.

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Brad
So like that cow I talked about where we see maybe one little clot in her outter, that's where we want to use this product right away to get ahead before it creates too many issues. So this product is a bio engineered oil that creates a filming barrier in contact with the other tissue it protects. It provides temporary relief from bacteria wreaking havoc in the mammary system.

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Brad
And then this regenerative tissue performs its natural defense mechanism. So you're allowing the cow to fight off this bug or whatever you got. So this is the treatment protocol that you would use for oscillating mass. Cow gets mastitis or early signs of mastitis. You would treat them in the quarter morning and night for four days. So across four days you use eight tubes of this product in the utter.

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Brad
So four days no milk withdrawal if you don't want to. We actually withdraw the milk just because it's better that way. And we feed with calves. So let's talk about some of the studies that we did first here on lactating cows. So the idea was can we reduce somatic cell count in chronically infected cows. So in late 2022 I actually did a small pilot study with 18 cows.

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Brad
They were about 90 days in milk. They had had chronic somatic cell count issues for three months from monthly dry sampling. So they were all over 350,000. Actually, the somatic cell

count ranged from 350,000 to 7.5 million. However, cows had no visible signs of mastitis. All subclinical mastitis, no clots, no clinical signs, all subclinical. So we decided that we would do a full course treatment on these animals and see where they were.

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Brad
14 days later, after administration. Well, the interesting fact is that somatic cell counts were reduced by 33% 14 days after we started administration of this product. Some of the cows that were 500,000 went to 150,000. I had a cow go from 1.2 million down to 200,000. Actually one high cow at 6 million went to 2 million. But overall we reduced mastitis in a majority of these cows.

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Brad
There are some cows. It didn't work. One cow was at 800,000, stayed at 800,000. But overall, across these 18 cows, somatic cell counts were reduced by 33%. Milk production. Maybe we had a little bit higher milk production in the oscillated treated cows versus some control cows, but not not much difference. Obviously on a small number of cows. I wanted to give this a try.

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Brad
So I in 2023 I decided I wanted to do some more studies. So we looked at 30 cows this time that had high somatic cell count from DHEA. They were part of a group that we dumped milk obviously to feed calves. So we had we were still milking cows, basically milking high somatic cell count cows to feed calves.

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Brad
So we identified infective quarters with the California mastitis test. And then we used also I am asked in the affected quarter for each milking for four days. So eight milking cows was treated for that. Again what did we see. Seven days after treatment we saw 31% lower somatic cell counts in these cows, just like we did the year before.

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Brad
Again, about 30% reduction in somatic cell counts. Some cows that were high went low. Some cows stayed the same. Obviously you're going to get some of that. These were high somatic cell count cows kind of on their last leg. Can we try to reduce mastitis in them. Yes we did on a majority of the cows. Obviously some of these cars that were pretty high, one cow was at 5 million and went to 2 million.

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Brad
More than likely. She's probably still got severe cases of mastitis, but seven days later 30% lower. Now, maybe some of these cows could have done better if we did another follow up treatment and treated them for another four days. We may have helped. Some of these cows continued to reduce their somatic cell count, but across both of these studies, 30% reduction in somatic cell count from high somatic cell count.

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Brad
Cows I'd say that's pretty good. So that's reducing mastitis or high somatic cell count cows with this product. And we'll be looking at it in the future here. Doing it on a much larger sample of cows, maybe working with some producer farms that are looking at trying to reduce mastitis or early, early identifying mastitis and using this product.

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Brad
So we'll be doing more with lactating cows, but let's talk about how we've used it in dry off. So we could also use this during dry off. So our goal was to evaluate what was the limit for drying off of cows compared to an antibiotic therapy. So how do you use this for dry off. So use one two per quarter for the last two milking.

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Brad
So you milked the cow and the second to last milking before you're going to dry her off. You put one tube in each cow and then at the last milking you put one tube in each cow. So how we did it, we did it with the evening milking and then the morning milking. We dried off the cows. So at night put the overlay amassed in the quarter.

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Brad
And then after the morning milking we used those lay amassed again, dried off the cow. So no antibiotics for us. We compared it with tomorrow, which is an antibiotic therapy in cows that we use for drying off. And we've used that for drying off quite a bit. You know, one one tube in each cow for dry cows there's a milk with hold 72 hours.

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Brad
There's a beef withdrawal of 42 days from the last infusion. So standard antibiotic treatment for for dry cows this was not selective dry cow therapy. We used it on all. We had 67 cows. And we did this in late 2023. And into 2024. So we had 67 cows. 33 of the cows were given

OHS. Liam asked. So again, one tube in the quarter, second to last milking, one to in each quarter at the last milking, and then compared to 34 cows that were given tomorrow dry cow treatment.

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Brad
We milked, cultured the cows before they were dried off, and then we cultured them at when they calved and compared subsequent milk production, somatic cell count after that. So all cows had no visible signs of mastitis at dry off. So we wanted to take that out of the equation and not have cows that were compromised with mastitis or no visible signs of, of mastitis.

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Brad
So our, our data set there was about 60% were first lactation cows, 40% were second in greater lactation cows, about 30% Holstein and 70% crossbred. In our study. If I look at milk cultures, there's always a challenge with milk cultures and culturing quarters and making sure you're clean and getting everything clean. But if I look at the no growth, so these are milk cultures that had no growth in them.

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Brad
They were pretty similar across treatments. I was Liam asked if I look at each quarter 40% versus 41%, what tomorrow if I look at the right front quarters, 48 versus 47 in the left and the right rear quarters, about 52%. No growth with also Liam missed 50% tomorrow. So was there any difference in cultures with this product? No, not at all.

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Brad
So somatic cell count was similar for each of the treatment groups, either the lambs or tomorrow across the first five months of lactation. So we watched these cows for five months into lactation. Somatic cell count on average 197 for the ozone layer cows about 125 for the tomorrow cows. So quite low somatic cell counts for each of these animals.

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Brad
No big difference in that at all. Milk production was not different across those five months. So in the end we found no differences between the two treatment groups on curing the probability of mastitis infection during the dry period. I think in the end, we this product really showed promise as use as a dry cow therapy really because of no milk or beef withdrawal.

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Brad
Obviously, we want to look at more research in the future and we're going to do that. But I

did a little bit of economics as well with those. So if you think about from an economic standpoint, tomorrow has a 72 hour milk withhold. So three days, 42 days of beef withdrawal. So if I look at a two ex milking herd withholding for for milking at 60 pounds per cow and I took the cost of each of the products.

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Brad
So Liam master tomorrow actually also Liam asked is a little more expensive than antibiotic therapy actually. So that is a consideration because you're using eight tubes instead of just four. So I if I dump 120 pounds of milk at $18 100 weight, we probably have a loss of $22 per cow by using an antibiotic compared to a non antibiotic.

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Brad
And that's giving just one more day credit for a cow 1000 cow dairy. That's $21,000 loss for withholding milk, a $332 loss of cows, $32,000 on a thousand cow herd. If you're thinking economics from milk withdrawal, and that might be a benefit to use at dry off is that there's no meat or milk withdrawal. Now, obviously you probably shouldn't just put the milk right in the tank.

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Brad
You obviously need to check it to make sure there's no mastitis. No other problems with it. Instead of just saying, oh, well, Brad says you can milk those cows because it doesn't have any milk withdrawal. No, you still need to check the milk to see if it's consumable. And no mastitis, no visible signs. But it certainly shows promise in reducing somatic cell count in chronic cows.

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Brad
And it has economic benefit because it doesn't have a milk withdrawal or a beef withdrawal. So it certainly is an alternative for cows when we're trying to reduce antibiotic use. One last little study that I was part of a group out of Colorado that was looking at an inter mammary application of a kava crow based botanical product at dry off on other health.

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Brad
So what is kava crow? Well, it's a natural compound. It's found in essential oils of plants like oregano and thyme. It's known for anti-microbial and anti-inflammatory properties. So it kind of fits along with use using less antibiotics. It's a product. It's called optimum Muter flush. It's from Van Beek Natural science. So in this study was done in Colorado.

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It looked at 200 cows that were enrolled in this study at dry off. And they were assigned to one of two treatment groups. So there was a control treatment group, which basically received ten millimeters of distilled water in each quarter. So kind of a control mechanism in the other 100 cows receive ten mils of this optimum uder flush in each quarter.

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Brad
So they took composite milk samples and somatic cell counts that dry off and then looked at week one and week two. After cabin, just to see what happened in the end. What were the results? Well, there was no treatment effect on somatic cell count that we week one or week two. So somatic cell counts were the same between groups.

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Brad
Whether you received the non antibiotic treatment or just the control there was no treatment effect on a distribution of cultured pathogens. So comparing growth versus no growth gram positive versus gram negative and major or minor pathogens. So really no big difference. Interesting fact if I look at dry off about 40% of the cows this is across. The treatments had no growth which is kind of what we saw, maybe a little bit less than what we saw in our herd.

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Brad
20% of these cows had staph aureus, about 30% had staphylococcus non aureus. About 2.5% were E coli and about 3% were contaminated. If you look at week one and week two, there wasn't much change in the distribution of these bacteria isolates found at dry off. So about the same, about the same. So there is no difference in treatment groups for the incidence of clinical mastitis or calling within 30 days of milk.

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Brad
So in the end we concluded that there were no effects on other health were identified. Following this application at dry off of this botanical product used in this study. So again, it kind of shows that there is promise to some of these products that are non antibiotic therapy that we could use either dry off or for treating cows with early clinical mastitis.

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Brad
I think it's important that we continue to explore these different options. Obviously a lot of people are concerned about antibiotic use in dairy cows, and I think some of these show a lot of promise, and we're going to continue to work on those and work with some of these different products to help reduce mastitis or somatic cell count in our herd.

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Brad
So hopefully you learned a little bit today about some different treatment options for clinical mastitis in dairy herds. And where you might look both of these products are available from a commercial standpoint, so you can use them. And we'll be exploring more with them too. So with that, if you have any comments or questions, scathing rebuttals, you can contact Emily at the Moos room at Almos r Om at Umkc Edu, or find us on the web at University of Minnesota Livestock Extension or and WC rock area with that.

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Brad
If you have a great day by to eat.