DAIRY VETERINARY NEWSLETTER

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Cure Rates for Treatments vs. Bovine Mastitis - Some New Studies

Surveys of reader interest, downloads of extension publications, etc. indicate that dairy producers and veterinarians are highly interested in treatment and cure rate data. Despite the widespread research into and the fairly wide adoption of preventive, genetic and husbandry measures to fight disease, we can't prevent all cases of disease, and interest in comparison of treatment efficacies is understandably high.

In the pages of this newsletter, we have discussed cure rates vs. mastitis pathogens and calf infectious diseases before. Those previous issues can be found electronically at:

https://extension.usu.edu/dairy/files/uploads/new%20pdfs/Utah%20State%20Dairy%20Vet%20Newsletter%20March%202007.pdf

https://extension.usu.edu/dairy/files/uploads/new%20pdfs/Dairy%20Vet%20Newsletter%20Jan%202009.pdf

However, what if anything new has been published regarding treatments vs. bovine mastitis?

Ceftiofur - shorter and extended duration therapy vs. mastitis

A paper by Truchetti et al. in Can J Vet Res, 2014 studied intramammary ceftiofur treatment for naturally occurring cases of clinical mastitis. They compared 2 d vs. 8 d of treatment. The initial study population was 241 Holstein cows in 22 Canadian dairy herds that contracted "mild to moderate" (abnormal milk only or with quarter swelling, respectively, but no signs of systemic illness) clinical mastitis. Duplicate milk culture samples were collected pre-treatment and at 7, 14, and 21 d after last treatment. 116 cases were excluded because of no growth (n = 63) or contamination/missing samples/yeast isolated (n = 53). Another 37 cases were excluded because at least one follow up milk sample was not collected, or cows were administered additional treatment. The remaining 88 cases of clinical mastitis were caused by 12 different pathogens, the most common being *Staph aureus* and non-agalactiae streptococci (*Strep* spp.). Cases were randomly assigned to treatments of 125 mg of ceftiofur hydrochloride IMM infusion every 24 h for 2 d or the same regimen for 8 consecutive d.

The final 88 qualified mastitis cases and their bacterial cure rates (defined as no clinical signs or isolation of bacteria at any of the 3 follow up cultures) are shown in this table:

Bacteriological Cure Rates, Ceftiofur Intramammary Treatment

Bacteria	2 d group (n)	8 d group (n)
Staphylococcus aureus	**0% (0/20)***	**47.4% (9/19)***
Streptococcus spp.	64.3% (9/14)	81.8% (9/11)
Overall	**31.9% (15/47)***	**61% (25/41)***

* = significantly different, $P < 0.05$
Modified from Table III, Truchetti et al. Can J Vet Res, 2014

It can be seen that the significant difference in bacteriological cure rates between the regimens is largely driven by the difference in cure rates vs. *Staph aureus*. However, the cure rates vs. other pathogens, which were not broken out in the paper, were only 6/13 (46%) for 2 d treatment and 7/11 (64%) for 8 d treatment. None of the cure rates reported are high relative to previous reports of bacteriological mastitis cure rates, and those for 2 d of ceftiofur are comparatively low. It must be kept in mind that compared with data from years ago, cure rates associated with other antibiotic treatments vs. mastitis may have decreased; we can't be sure without more recent data.

Efficacy of a botanical preparation for treatment of bovine mastitis

Pinedo et al., in Can Vet J 2013, studied a botanical preparation (PHYTO-MAST®) for treatment of mastitis. The product contains extracts of *Thymus vulgaris, Gaultheria procumbens, Glycyrrhiza uralensis, Angelica sinensis,* and other compounds. The authors said, "- - it is not approved for intramammary treatment of mastitis in North America and the therapeutic effect of this product in clinical mastitis has not been tested in controlled studies." Their main objective was to evaluate its efficacy in an organic dairy system. The study was in one herd of 1200 Holsteins on a certified organic dry lot dairy in Colorado. The paper includes a good description of the farm practices, including recommended mastitis control measures, and of the herd, including DHIA SCC "consistently <175,000 cells/ml".

The study included 194 cases of clinical mastitis in 163 cows from February to September. Case criteria were identical to the study above, abnormal milk or quarter included, systemic signs of illness excluded. Single milk culture samples were collected pre-treatment and at 14 and 21 d after last treatment. Cows were blocked by lactation number (1, 2+) and randomly assigned within blocks to either PHYTO-MAST (PM) or control (C) groups. Cows in the PM group received IMM infusion of 15 ml of PM every 12 h for 3 d along with stripping of the teat before product application. Cows in the C group received "stripping of the teat in the affected quarter" every 12 h for 3 d. Both groups were housed in the same treatment facility. There were initially 101 PM and 93 C cases; why this was not closer to 50:50 was not explained. 12 PM and 9 C cows later left the trial because of systemic illness, additional treatment, or leaving the herd. There were 79 PM and 64 C cases left after 28 d, and how the additional cases were lost to follow up was not explained.

Treatment groups did not differ in pre-treatment bacteria isolated or other cow factors. The most common isolates at enrollment: coagulase-negative staphylococci (40.3%), *E. coli* (20.1%), *Staph aureus* (10.3%), and *Strep* spp. (8.2%). Cure rates were not broken down by individual pathogens, and they did not appear to account for the fact that 16.8% of cases had no growth at enrollment, which was how cure rate was defined. 14 d cure rates were reported as 29.2% C and 41.7% PM, but from the paper's table I calculate them as 31.3%

C and 43.5% PM, not significantly different. 28 d cure rates were 38.8% C and 41.3% PM (again from the table I calculated 51.6% C and 48.1% PM), not significantly different. The authors did some interesting survival (time to event analysis), showing that especially from 4 d to 14 d post-treatment, recovery in terms of clinically normal milk was faster with the PM treatment (P = .047). Nevertheless, there were still approximately 10% abnormal quarters in each group by 28 d post-treatment. There were also some analyses of SCC, and they were not significantly affected following either PM or C (P = 0.92).

The authors concluded, "Neither the probability of a [SCC < 200,000/ml] after recovery nor the level of bacteriological cure at [14 d] and [28 d] was affected by the treatment. Further research is needed [regarding] PHYTO-MAST® to obtain maximum efficacy for the treatment of clinical mastitis."

These were both interesting and timely studies regarding treatment of mastitis. More field trials to evaluate cure rates, including reevaluation of treatments that may not have been studied for decades, vs. mastitis are needed. It is not the intent of the reports above to make judgments or endorsements regarding the products, only to convey information.

Utah is the Fifth Ranked State in Percentage Growth of Dairy Cow Numbers

According to an article by Lucas Sjostrom in Dairy Herd Management, July 2014, Utah is the fifth ranked state in growth as measured by percentage increase in numbers of dairy cattle. As might be expected, many of the top 10 dairy states (by cow numbers) continue to decline in dairy cattle population. Nevertheless, a trend of more than 25 years that California had continued to increase in cow numbers while Wisconsin and Minnesota plummeted in number of dairy cattle has been reversed between 2008 and 2013. Below, from that article, first a table of the top 10 states and their dairy cow numbers over 5 years, and on the next page, a table of the top 10 growth states:

Top 10 Dairy Cow States

Rank	State	2008	2013	Cow Growth
1	California	1780	1844	-4%
2	Wisconsin	1271	1252	1%
3	New York	610	626	-3%
4	Idaho	573	549	4%
5	Pennsylvania	533	549	-3%
6	Minnesota	464	464	0%
7	Texas	437	418	4%
8	Michigan	380	350	8%
9	New Mexico	323	338	-5%
10	Ohio	270	280	-4%

(thousands of cows)

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Top 10 Dairy Growth States

Rank	State	2013	2008	Cow growth (%)
1	Hawaii	2.2	1.7	23%
2	Kansas	134	117	13%
3	Washington	266	244	8%
4	Michigan	380	350	8%
5	**Utah**	**92**	**85**	**8%**
6	Oregon	123	114	7%
7	Nevada	29	27	7%
8	Colorado	137	128	7%
9	Indiana	176	167	5%
10	Georgia	80	76	5%
		(thousands of cows)		

Please let us know your comments and also suggestions for future topics. I can be reached at (435) 760-3731 (Cell), (435) 797-1899 M-Tues, (435) 797-7120 W-F or **David.Wilson@usu.edu**.

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