

Early detection of subclinical mastitis with QScout[®] MLD test and follow-up treatment increases milk production and quality

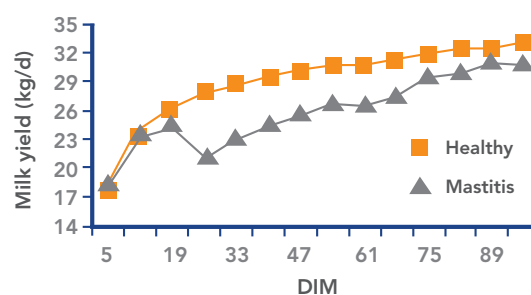
Quick Read

- On-farm, milk leukocyte differential (MLD) testing provides faster, more accurate diagnosis of inflammation compared to somatic cell count (SCC).
- QScout[®] Farm Lab provides on-farm diagnosis of subclinical mastitis by analyzing ratios of white blood cell types that fight infection – in minutes per cow.
- QScout MLD is a new test that makes treating subclinical mastitis at the quarter level feasible.
- Treating subclinical mastitis, based on the QScout MLD diagnosis, yielded a 1,325-pound milk production increase at projected 305d (day) ME milk.¹
- Cows in the “treatment” group had significantly fewer positive cultures and lower somatic cell counts (SCC), compared to cows in the “no treatment” group.

Introduction

Subclinical mastitis often goes undetected and, thus, goes untreated. Finding and treating subclinical mastitis early in lactation can minimize milk production losses and improve profitability. Accurately diagnosing and treating subclinical mastitis as the cow ramps up for peak milk production² sets the stage for optimizing milk yield during her entire lactation. As Figure 1 shows, milk production drops dramatically during the first three months after calving when a cow experiences clinical mastitis. This impact on early lactation milk production reduces peak production and production for the remainder of that lactation – and typically into subsequent lactations.

Figure 1. Early mastitis impacts milk yield throughout lactation.



Animals that experience mastitis early in lactation perform far below those that are mastitis free in early lactation.



Early detection of subclinical mastitis with QScout® MLD test and follow-up treatment increases milk production and quality



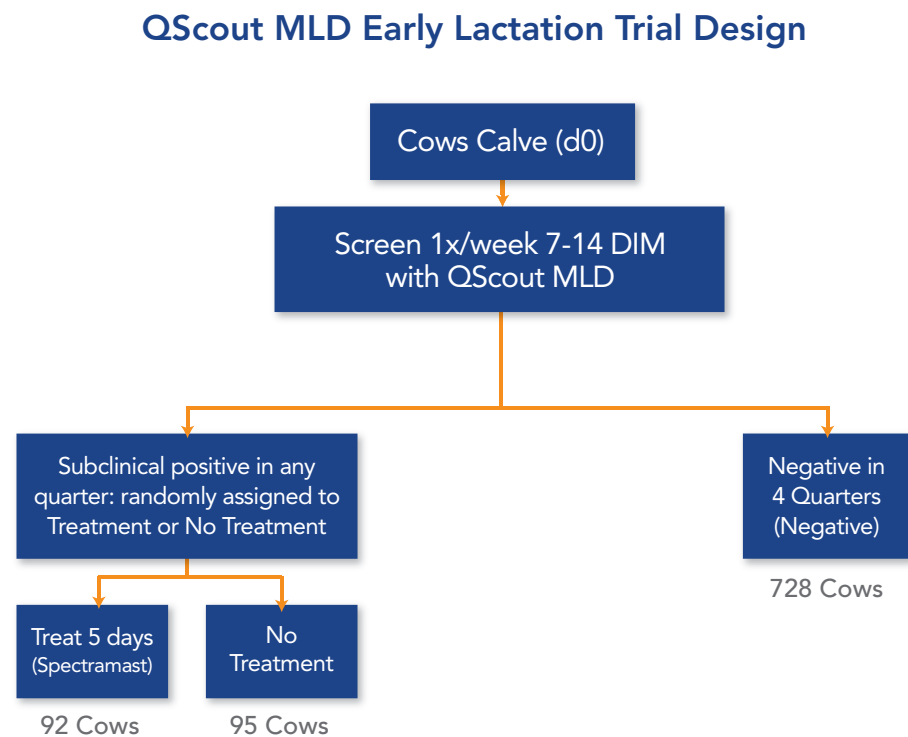
Introduction, continued

Prompt diagnosis and treatment of subclinical mastitis does improve treatment success.³ Research also shows that prompt diagnosis and treatment reduces the risk of clinical mastitis developing and contagious infections spreading throughout the herd.⁴

Study design

The objective of this 14-month, on-farm study (see Figure 2) was to determine the impact of antibiotic treatment on quarters with subclinical mastitis in early lactation. Diagnosis was based on QScout MLD. The screening was done at 7 to 14 days in milk (DIM). (Research presented at the 2013 National Mastitis Council Annual Meeting showed that screening quarter milk samples is best performed in the second week in milk.⁵) Cows with at least one infected quarter were randomly split into the treatment group (n=92) or no treatment group (n=95). Those in the treatment group received Spectramast® LC* for 5 days in the infected quarter, whereas those in the no treatment group did not receive a mastitis-fighting antibiotic. The two groups had similar infection rates and SCC at enrollment.

Figure 2. QScout MLD early lactation trial design



Results

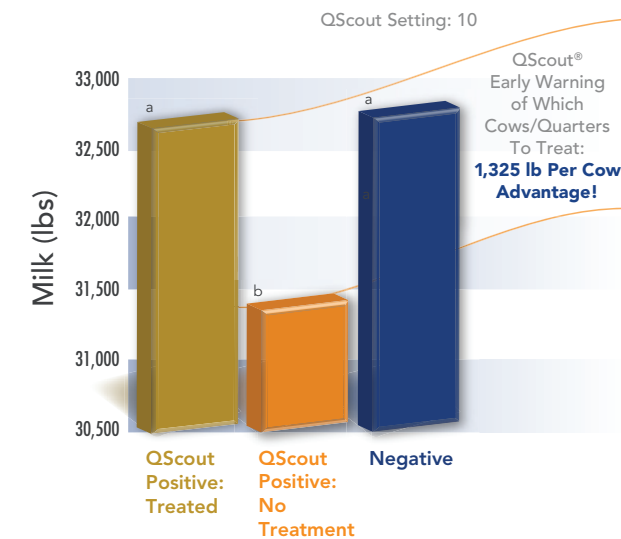
In the early lactation trial, cows that tested positive for subclinical mastitis in one or more quarters, based on QScout MLD diagnosis, and received antibiotic treatment in the infected quarter(s) had a lower mastitis incidence rate and reduced SCC, compared to cows with subclinical mastitis that did not receive antibiotic treatment.

Among the treatment group, mastitis incidence fell 40%, falling in line with the control group that tested negative at enrollment. In comparison, the mastitis incidence increased slightly in the no treatment group (see Table 1). The treatment group out-produced those in the no treatment group by an average of **1,325 pounds of milk production per cow** (see Figure 3) at projected 305d ME milk.¹ Plus, milk samples from the treatment group had 115,000 fewer somatic cells/mL on average compared to the no treatment group.

Table 1. Treating subclinical mastitis resulted in fewer mastitis incidents

Group	Culture Positive Rate	
	d7-14 (at enrollment)	d45
No Treatment	18.95%	20.56%
Treatment	17.12%	10.29%
Control (negative)	9.64%	13.01%

Figure 3. Treating subclinical mastitis increases milk production



a,b Values with different letters differ, P = 0.0010 November, 2014 DHIA

**Trial results represent milk production data from cows diagnosed positive for subclinical mastitis at QScout setting 10, or those that are most likely to respond to treatment. Cows diagnosed at settings 17-18 are severe cases, and should be cultured to identify the infection-causing pathogen.

Results, continued

Additionally, trial results revealed improved reproductive performance associated with addressing subclinical mastitis in early lactation. Cows in the treatment group experienced 14 fewer days open and 18% fewer services per conception, compared to cows in the no treatment group (see Table 2).

Table 2. Treated group shows improved reproduction results

Group	Reproduction Results		
	Days to 1st Service	Days Open	Services per Conception
No Treatment	60.0	131.0 ^b	2.84 ^d
Treatment	62	117.0 ^{a,b}	2.34 ^{c,d}
Control (negative)	60.9	104.2 ^a	2.26 ^c

Cost of a day open past 100 DIM is estimated at \$4-\$8/day.

a,b Values with different superscripts in this column differ P=0.0149.
c,d Values with different superscripts in this column differ P=0.0208.

Discussion and conclusion

On-farm use of QScout MLD allows dairy producers to confidently implement early lactation detection of subclinical mastitis by quarter. Finding and treating subclinical mastitis early prevents milk yield losses – at peak production and throughout the lactation. Additionally, prompt treatment helps producers capture milk quality premiums, lower mastitis incidence, increase cow longevity, improve reproduction, reduce transmission of mastitis pathogens and, ultimately, enhance profitability.

¹Hockett M. 2014. Early lactation on-farm trials. In: Proc. 54th National Mastitis Council Annual Meeting, Memphis, TN. p. 239-240.

²Wilson, D. J., R. N. González, J. Hertl, H. F. Schulte, G. J. Bennett, Y. H. Schukken, and Y. T. Gröhn. 2004. Effect of clinical mastitis on the lactation curve: A mixed model estimation using daily milk weights. J. Dairy Sci. 87:2073–2084.

³van den Borne, B., G. van Schaik, T. Lam, and M. Nielen. 2010. Therapeutic effects of antimicrobial treatment during lactation of recently acquired bovine subclinical mastitis: Two linked randomized field trials. J. Dairy Sci. 93(1), 218-233.

⁴van den Borne, B. H. P. 2010. Impact of bovine subclinical mastitis and effect of lactational treatment. PhD Diss. Utrecht University, Utrecht, The Netherlands.

⁵Azizoglu, R. O., R. Rodriguez, R. Lyman, and K. L. Anderson. 2013. Assessment of early lactation screening time using microbiological evaluation of quarter milk samples. In: Proc. 52nd National Mastitis Council Annual Meeting, San Diego, CA. p. 119–120.

*Spectramast® LC Sterile Suspension (ceftiofur hydrochloride) is a registered trademark of Zoetis. The use of product names within this document is for user information and does not imply endorsement by Advanced Animal Diagnostics.

The use of product names within this document is for user information and does not imply endorsement by Advanced Animal Diagnostics.

AAAD-6-2016

© Advanced Animal Diagnostics | All rights reserved.

QScout is a registered trademark of Advanced Animal Diagnostics, Inc. and the AAD logo is a trademark of Advanced Animal Diagnostics, Inc.