

**Table 1.** Farm characteristics for enrolled dairies. Farms 1-6 used 24 hour sample pickup 5 days per week, Farms A and B were trained to use on farm culture to drive their treatment decisions.

<b>Herd</b>	<b>Bedding</b>	<b>MMI<sup>1</sup></b>	<b>County</b>	<b>Herd Size<sup>2</sup></b>	<b>Start</b>	<b>End</b>	<b>Duration (d)</b>	<b>Quarters enrolled</b>
1	Sand	2.2	Onondaga	820	1/30/2017	9/21/2017	234	150
2	Sand	1.8	Cortland	600	1/29/2017	12/20/2017	325	113
3	Peat Moss	4.6	Cortland	510	1/29/2017	10/28/2017	272	153
4	Sand	3.0	Onondaga	910	2/1/2017	7/30/2017	179	154
5	Sand and sawdust	3.0	Cortland	1,040	2/1/2017	12/21/2017	323	96
6	Sawdust	5.3	Onondaga	630	10/17/2017	12/6/2017	50	53
A	Sawdust	5.7	Broome	1,050	1/23/2017	3/30/2017	66	159
B	Sand	3.6	Cortland	560	2/21/2017	7/4/2017	133	153
<b>Total</b>							<b>198</b>	<b>1,031</b>

<sup>1</sup>Apparent monthly mastitis incidence. Calculated based on computer data at time of enrollment, number of treated mastitis cases per month. For an individual cow, treatments had to occur at least 14 days apart to be considered a new case.

<sup>2</sup>Number of lactating cows at time of enrollment

<sup>3</sup>On farm culture herd

**Table 2.** Etiology of infection at detection by each enrolled herd<sup>1</sup>

Culture Result	Herd								Total n (%)
	1 n (%)	2 n (%)	3 n (%)	4 n (%)	5 n (%)	6 n (%)	A n (%)	B n (%)	
Negative	43 (28.7)	42 (37.2)	33 (21.6)	75 (48.7)	26 (27.1)	30 (56.6)	53 (33.3)	53 (34.6)	355 (34.4)
Gram Negative	51 (34)	34 (30)	64 (41.8)	47 (30.5)	47 (49)	15 (28.3)	24 (15.1)	37 (24.1)	319 (30.9)
<i>E.coli</i>	15 (10)	13 (11.5)	62 (40.5)	24 (15.6)	21 (21.9)	1 (1.9)	9 (5.7)	5 (3.3)	149 (14.5)
<i>Klebisella</i>	23 (15.3)	17 (15)	0 (0)	13 (8.4)	20 (20.8)	6 (11.3)	6 (3.8)	21 (13.7)	105 (10.2)
Other <sup>2</sup>	13 (8.7)	4 (3.5)	2 (1.3)	10 (6.5)	6 (6.3)	8 (15.1)	9 (5.7)	11 (7.2)	65 (6.3)
Gram Positive	42 (28)	33 (29.2)	42 (27.5)	28 (18.2)	13 (13.5)	4 (7.5)	71 (44.7)	48 (31.4)	281 (27.3)
<i>Staph aureus</i>	2 (1.3)	0 (0)	10 (6.5)	0 (0)	1 (1)	0 (0)	32 (20.1)	0 (0)	45 (4.4)
<i>Staph spp.</i>	2 (1.3)	7 (6.2)	4 (2.6)	4 (2.6)	1 (1)	0 (0)	7 (4.4)	8 (5.2)	33 (3.2)
<i>Strep dysgalactiae</i>	5 (3.3)	6 (5.3)	23 (15)	7 (4.5)	3 (3.1)	0 (0)	21 (13.2)	8 (5.2)	73 (7.1)
<i>Strep uberis</i>	8 (5.3)	3 (2.7)	4 (2.6)	4 (2.6)	1 (1)	1 (1.9)	4 (2.5)	0 (0)	25 (2.4)
<i>Strep spp.</i>	5 (3.3)	3 (2.7)	0 (0)	1 (0.6)	1 (1)	0 (0)	3 (1.9)	1 (0.7)	14 (1.4)
<i>Lactococcus</i>	11 (7.3)	6 (5.3)	0 (0)	5 (3.2)	1 (1)	0 (0)	1 (0.6)	20 (13.1)	44 (4.3)
Mixed <sup>3</sup>	6 (4)	4 (3.5)	0 (0)	3 (1.9)	4 (4.2)	1 (1.9)	3 (1.9)	10 (6.5)	31 (3.0)
Other <sup>4</sup>	3 (2)	4 (3.5)	1 (0.7)	4 (2.6)	1 (1)	2 (3.8)	0 (0)	1 (0.7)	16 (1.6)
Other <sup>5</sup>	13 (8.7)	3 (2.7)	9 (5.9)	0 (0)	3 (3.1)	0 (0)	5 (3.1)	9 (5.9)	42 (4.1)
Contamination	1 (0.7)	1 (0.9)	5 (3.3)	4 (2.6)	7 (7.3)	4 (7.5)	6 (3.8)	6 (3.9)	34 (3.3)
<b>Total</b>	150	113	153	154	96	53	159	153	1031

<sup>1</sup>Etiological classification is based on aerobic culture results and MALDI-TOF performed by Quality Milk and Production Services for all dairies.

<sup>2</sup>Includes *Enterobacter spp.*, *Citrobacter spp.*, Gram-negative bacillus, *Pasteurella*, *Pseudomonas*, and *Serratia*.

<sup>3</sup>Had at least 1 Gram-positive organism in addition to another organism, dictating treatment.

<sup>4</sup>Includes Gram-positive bacillus and *Enterococcus spp.*

<sup>5</sup>Includes *Trueperella pyogenes* and *Corynebacterium spp.*

**Table 3.** Treatment protocols, compliance, and bulk tank and milk production characteristics for medium-sized NY dairy herds enrolled in a pathogen-based nonsevere mastitis treatment protocol. Farms 1-6 used 24 hour sample pickup 5 days per week, Farms A and B were trained to use on farm culture to drive their treatment decisions.

Herd	Treat:	Compliance <sup>1</sup>	Wait Weekend? <sup>2</sup>	BTSCC before <sup>3</sup>	BTSCC after <sup>4</sup>	ME305 before <sup>5</sup>	ME305 after <sup>6</sup>
<b>1</b>	Gram +	UNK <sup>7</sup>	no	169,000	125,000	32,650	26,083
<b>2</b>	Gram +	85%	yes	188,000	146,000	32,275	31,135
<b>3</b>	Gram +, cull <i>S. aureus</i>	96%	yes	139,000	178,000	30,777	30,793
<b>4</b>	Gram +	94%	yes	90,000	89,000	31,360	31,800
<b>5</b>	All but “No-Growth”	73%	no	109,000	116,000	28,694	28,915
<b>6</b>	Gram +	85%	no	208,000	195,000	27,744	27,744
<b>A</b>	Gram +	59%	N/A	184,000	198,000	*	*
<b>B</b>	Gram +, <i>Klebsiella spp.</i>	76%	N/A	240,000	133,000	33,169	31,218
<b>Average</b>				<b>165,875</b>	<b>147,500</b>	<b>30,953</b>	<b>29,670</b>

<sup>1</sup>The percentage of cases treated according to treatment scheme that was agreed upon by veterinarians and management and considering whether farm decided to wait to treat over the weekend or not.

<sup>2</sup>For 5 day per week farms, whether or not the management waited until results were returned prior to treatment. On farm culture herds (A, B) had access to data 7 days per week.

<sup>3</sup>Bulk tank somatic cell count prior to the start of the trial (see Table 1 for start date for individual farms)

<sup>4</sup>Bulk tank somatic cell count after the trial was complete (see Table 1 for end date for individual farms)

<sup>5</sup>Mature equivalent milk production (lbs), a standardized estimation of how much a group of cows would have produced for 305 days for the specific dairy listed, at the start of the trial. Herd A’s computer program did not allow for this calculation. As an alternative, the average daily production was 87.3lbs.

<sup>6</sup>Mature equivalent milk production at the end of the trial (lbs). Herd A’s computer program did not allow for this calculation. As an alternative, the average daily production per cow was 86.4lbs.

<sup>7</sup>Due to non-compliance of entrance of treatment records into the computer system, we were unable to retrieve this information from this dairy.

**Table 4.** Monthly mastitis incidence (MMI) and percentage of cases retreated prior to and after a pathogen-based treatment trial. Farms 1-6 used 24 hour sample pickup 5 days per week, Farms A and B were trained to use on farm culture to drive their treatment decisions.

Prior to Trial <sup>1</sup>					During/After Trial <sup>2</sup>			
Herd	# Cows	# Cases	MMI(%)	%Retreats	# Cows	# Cases	MMI(%)	% Retreats
1	125	151	2.2	20.8	122	150	2.3	23.0
2	20	21	1.8	5.0	89	113	1.7	27.0
3	50	55	4.6	10.0	122	153	3.3	25.4
4	73	92	3.0	26.0	109	154	2.8	41.3
5	207	237	3.0	14.5	320	354 <sup>a</sup>	3.2	10.6
6	54	69	5.3	27.8	48	53	5.0	10.4
A	UNK	UNK	5.7	UNK	125	159	6.9	27.2
B	72	90	3.6	25.0	99	153	6.2	54.5

<sup>1</sup>Values are reflective of the number of cows over the identical period as the trial period, but from the prior year.

These numbers are likely inaccurate as recording of mastitis events was not consistent.

<sup>2</sup>Values are reflective of the cases enrolled in the trial (all nonsevere clinical cases during the trial period). These values are appropriate as management was instructed on how to consistently record events.

<sup>a</sup>Herd 5 did not submit cultures from all mastitis cases during the trial period. This number reflects the number of cases occurring during the period.

**Table 5.** Agreement between on-farm and QMPS (laboratory) culture results for Herd A. Shaded boxes represent agreement between the two methods.

On-farm culture	QMPS (laboratory) Culture						Total
	Negative	<i>Staph. aureus</i>	Gram +	Gram -	Mixed with Gram + <sup>1</sup>	Other <sup>2</sup>	
Negative	34	1	5	3	0	1	44
<i>Staph. aureus</i>	0	25	1	0	2	0	28
Gram +	12	5	29	1	0	6	53
Gram -	6	0	0	18	1	0	25
Mixed with Gram + <sup>1</sup>	1	1	1	2	0	3	8
Other <sup>2</sup>	0	0	0	0	0	1	1
Total	53	32	36	24	3	11	159

<sup>1</sup>A culture that had at least 1 Gram-positive organism in addition to one other organism

<sup>2</sup>Included contamination and *Corynebacterium spp.*

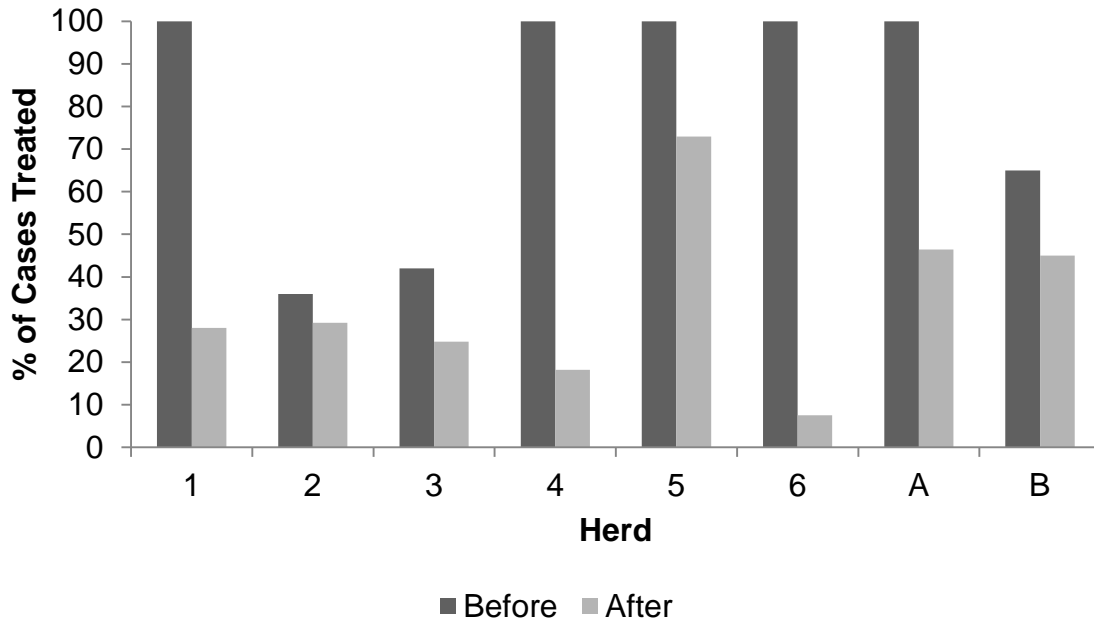
**Table 6.** Agreement between on-farm and QMPS (laboratory) culture results for Herd B. Shaded boxes represent agreement between the two methods.

On-farm culture	QMPS (laboratory) Culture						Total	
	Negative	<i>Klebsiella spp.</i>	<i>E. coli spp.</i>	Other Gram -	Gram +	Mixed with Gram + <sup>1</sup>		Other <sup>2</sup>
Negative	43	6	1	2	8	1	4	65
<i>Klebsiella spp.</i>	0	13	0	2	0	1	0	16
<i>E. coli spp.</i>	1	0	4	2	0	0	1	8
Other Gram -	0	0	0	0	0	0	0	0
Gram +	6	0	0	1	21	5	7	40
Mixed with Gram + <sup>1</sup>	0	0	0	0	0	0	1	1
Other <sup>2</sup>	1	1	0	3	0	10	0	15
Total	51	20	5	10	29	17	13	145 <sup>a</sup>

<sup>1</sup>A culture that had at least 1 Gram-positive organism in addition to one other organism

<sup>2</sup>Included contamination, *Trueperella pyogenes*, Yeast, and *Corynebacterium spp.*

<sup>a</sup>Eight results were not classified due to incubator error (machine was accidentally turned off)



**Figure 1.** Percent of nonsevere clinical mastitis cases treated with antibiotics prior to and after implementation of a pathogen-based treatment protocol by herd.