



Consultants Guide to Economics of Mastitis

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Source: NMC unless otherwise indicated. <http://www.nmconline.org/>

- NMC (formerly National Mastitis Council) is a global organization for mastitis control and milk quality

What is the estimated cost of mastitis to the US dairy herd?

1. Economic loss to the U.S. dairy industry is estimated at \$185 per cow per year.

- This value demonstrates total economic impact of *subclinical* mastitis to the industry and is based on a large research dataset. This value, \$185.00, or \$200/cow/yr., are frequently used to describe average impact of mastitis to the US dairy industry and are intended to draw attention to why we need to collectively focus and work toward lowering herd somatic cell count (Herd-SCC).
 - When using this value for individual herd mastitis intervention, remember that individual herds may have much less, or more, subclinical mastitis than the US average.
 - This average value was estimated when contagious pathogens were the predominant cause of herd mastitis problems. Although still relevant, more herd problems today are caused predominantly by environmental pathogens, although contagious pathogens do continue to reek havoc on individual farms.
 - Actual herd mastitis records are the best way to monitor results of interventions and assess economic impact of mastitis and interventions. *Unfortunately*, very few farms track mastitis costs and therefore have little economic information specific to their own farm to base mastitis decisions or to evaluate the economic impact of mastitis decisions.
 - The cost of subclinical mastitis only tells part of the story. Many herds have relatively low subclinical mastitis but experience higher than desired clinical mastitis. Clinical mastitis costs are not necessarily reflected in this value.
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What key ingredients go into the cost of mastitis for a herd or individual cows?

1. The estimated average milk loss per lactation for one infected quarter is 1600 lbs.

Estimated Annual Losses due to Mastitis¹

Source of Loss	Cost Per Cow (\$)	Percent of Total (%)
Reduced Production	\$121.00	66%
Replacement Cost	\$41.73	22.6%
Discarded Milk	\$10.45	5.7%
Treatment	\$7.36	4.1%
Veterinary Services	\$2.72	1.5%
Extra Labor	\$1.14	0.1%
TOTAL	\$184.40	100%

¹Assumptions:

- 1/3rd of cows are infected in an average of 1-1/2 quarters
 - Milk loss is estimated to be 856 lbs. per infected quarter
 - Milk price used to estimate costs was \$12.07/cwt
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- A few important points when using the table values in individual herds:
 - Reduced milk production is the greatest cost of mastitis but is difficult to measure without daily milk weights. Values provided are 'research based and can be used as a guideline for on-farm measurement of the economic impact of mastitis.
 - Cost items are presented in order of impact. For example, lost production (that silent economic threat that is difficult to prove), has the greatest impact on total mastitis costs.
 - Replacement cost is due to culling for mastitis. It is specifically due to the impact mastitis culling has on cow value (early cull income vs. milk income plus cull income when an animal is not culled until later in life). It is also based on the need to bring in replacements to replace mature cows culled due to mastitis.
 - Note that treatment, veterinary intervention, and labor, are minor costs in the average case of mastitis. However, they may still be important costs, especially on farms with many chronic cows. Days of treatment, and/or days of discarded milk are very variable from farm to farm and can contribute to very high mastitis costs on some farms.

How can bulk tank Somatic Cell count (BT-SCC) be used to estimate mastitis impact in a dairy herd?

- Bulk Tank Somatic Cell count is readily available on all farms so it would make sense to use BT-SCC decrease and economic impact as a quick way to demonstrate to the producer how

an intervention (e.g., use of Zinc-Copper Proteinate Product) may have assisted in reducing herd prevalence of mastitis.

- The following table may be used to validate Return on Investment (ROI) of a mastitis intervention that lowered herd BT-SCC.

Estimated Infection Level (Prevalence) and Loss of Milk Associated with BT-SCC¹

BT-SCC 1000 cells/ml	Infection Level % Quarters	Infection Level % Cows	Production Loss Percent
200	6%	4%	0%
500	16%	11%	6%
1000	32%	21%	18%
1500	48%	32%	29%

¹ Assumptions:

- Production Loss is calculated as a percent of production expected at 200,000cells/ml.
- Infection Level (Cows) is based on the assumption that the average infected cow is infected in 1-1/2 quarters.

- Example 1 in the Appendix demonstrates how to determine if a mastitis intervention can be justified through a decrease in BT-SCC.
 - A web based tool will be available in the near future. Contact S. Costello via e-mail for the Excel spreadsheet if interested (ssc10@psu.edu).

Appendix - Example 1.

Use of BT-SCC to estimate prevalence and economic impact of mastitis per day it stays at the current level

Herd Size = cows

Milk Production = lbs. (current with milk loss)

Milk Price = cwt.

BT-SCC 1000 cells/ml	Infection Level % of Quarters	Infection Level % of Cows	Production Loss Percent	Production Loss Factor	Cow Per Day	Herd Per Day
					\$ Loss Due to BT-SCC	\$ Loss Due to BT-SCC
200	6%	4%	0%	100%	\$ -	\$ -
300	9%	6%	2%	102%	\$ 0.21	\$ 1.26
400	12%	8%	4%	104%	\$ 0.42	\$ 3.36
500	16%	11%	6%	106%	\$ 0.63	\$ 6.93
600	20%	13%	8%	108%	\$ 0.84	\$ 10.92
700	22%	15%	10%	110%	\$ 1.05	\$ 15.75
800	26%	17%	13%	113%	\$ 1.37	\$ 23.21
900	29%	19%	15%	115%	\$ 1.58	\$ 29.93
1000	32%	21%	18%	118%	\$ 1.89	\$ 39.69
1500	48%	32%	29%	129%	\$ 3.05	\$ 97.44

Cow Per Day \$ Loss Due to BT-SCC =

The Economic Impact of Mastitis to a Cow for each day BTSCC remains the same

Herd Per Day \$ Loss Due to BT-SCC =

The Economic Impact of Mastitis to the Herd for each day BTSCC remains the same

What is the Return on Investment (ROI) for Lowering BT-SCC if due to the Intervention(s)?

Herd Mastitis Measure & Monitoring Interval:

Beginning BT-SCC =	500 cells/ml (per 1000)
Ending BT-SCC (following intervention) =	300 cells/ml (per 1000)
Time Period for BT-SCC Change =	180 days

Intervention 1:

Estimated Cost of Intervention 1 (per cow per day) =	Orbeseal \$1.85/cow/day
# Cows Exposed to Intervention 1 (over specified time) =	10 cows
Time period for Intervention 1 =	1 day
Total Cost of Intervention 1 (Cost/Cow/Day x # Cows x Total Time Period (days)) =	\$18.50

Intervention 2:

Estimated Cost of Intervention 2 (per cow per day) =	Organic Selenium \$0.035/cow/day
# Cows Exposed to Intervention 2 (over specified time) =	100 cows
Time period for Intervention 2 =	180 days
Total Cost of Intervention 2 (Cost/Cow/Day x # Cows x Total Time Period (days)) =	\$630.00

Total Cost of Interventions (over time period) =	\$648.50
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Economic Impact of Beginning BT-SCC:

Per Cow Per Day =	\$0.63/cow/day
For Entire Herd Per Day =	\$6.93/herd/day
For Herd Over Time Period Monitored =	\$1,247.00 for herd over 180 days

Economic Impact of Ending BT-SCC:

Per Cow Per Day =	\$0.21/cow/day
For Entire Herd Per Day =	\$1.26/herd/day
For Herd Over Time Period Monitored =	\$226.80 for herd over 180 days

Economic Impact from Reducing BT-SCC:

Before Cost of Intervention(s) is subtracted =	\$1,020.60 for herd over 180 days
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ROI of Reducing BT-SCC through intervention =	\$372.10 for herd over 180 days
ROI Per Cow Per Day =	\$0.02 (Over 11 month lactation ≈ \$7.00)