

Economics of Robotic Milking Systems

Annual Partial Budget Analysis

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Positive Impacts

Increased Incomes	
Increased Milk Production	\$54,978
Increased Milk Premiums	\$1,281
Increased Cull Cow Sales	-\$1,190
Total Increased Incomes	\$55,069

Decreased Expenses	
Reduced Heat Detection	\$2,738
Reduced Labor	\$27,375
Reduced Labor Management	\$3,650
Total Decreased Expenses	\$33,763

Total Positive Impacts \$88,831

Annual Value to Quality of Life =	\$10,000
Annual Value of Herd Software =	\$3,000

Negative Impacts

Increased Expenses	
Capital Recovery Cost of Robots (Dep & Int)	\$57,100
Increased Repair and Insurance Costs	\$12,350
Increased Feed Costs	\$19,760
Increased Cow Replacement Costs	-\$2,240
Increased Utilities and Supplies	\$945
Increased Records Management	\$1,825
Total Increased Expenses	\$89,740

Decreased Incomes Expected	
Total Decreased Incomes	\$0

Total Negative Impacts \$89,740

NET ANNUAL FINANCIAL IMPACT =	-\$909
with Quality of Life and Herd Software =	\$12,091

Herd and Financial Assumptions

	Units	Instructions or Reference Values
Herd Size	140 no. cows	Enter herd size, lactating and dry
Milk Price	\$17.00 \$ per cwt milk	Typical range \$13.00 - \$19.00 / cwt
Estimated Cost per Robot	\$210,000 \$ per robot	Include building cost for housing robots
Estimated Annual Change in Milking System Repair	\$10,600 \$ per farm	Typical range from \$5,000 - \$9,000/robot
Number of Robots Needed	2 no. robots	Typical range of 55-65 milking cows/robot
Years of Useful Life	10 years	Typical range is 7 -12 years
Value per Robot after Useful Life	\$40,000 \$ per robot	Typical range of 10-20% of purchase price
Interest Rate of Money	5.50 % interest rate	Value of own or borrowed money
Insurance Rate per \$1,000 Value	0.50 %	Typical rate is 0.5% per 1,000 investment
Increased Insurance Value of Robot vs. Current	\$350,000 \$ per farm	Value of robot(s) over current system

Labor Changes

Current Hours of Milking Labor	6.5 hours per day	Include set-up and cleanup
Anticipated Hours of Milking Labor	1.5 hours per day	Include fetching cows and cleanup
Current Hours of Heat Detection	0.5 hours per day	Typical is 0.25 - .75 hours
Anticipated Hours of Heat Detection	0 hours per day	Typical is 0 - .5 hours
Labor Rate for Milking and Heat Detection	\$15.00 \$ per hour	Typical rate is \$10 - \$18 with benefits
Increased Hours for Records Management	0.25 hours per day	Include AMS management records
Reduced Hours for Labor Management	0.5 hours per day	Include hiring, training, overseeing, etc.
Labor Rate for Records and Labor Management	\$20.00 \$ per hour	Typical rate of \$12 - \$25

Milk Production and Quality Changes

Lbs of Milk per Cow per Day, Past Year	70 lbs/cow/day	Typical range of 50 - 90 lbs
Projected Change in Milk Production	7 lbs/cow/day	Typical 3-15% more 2x; 0-9% less 3x
SCC Premium per 1,000 SCC Change	\$0.003 \$ per cwt	Typically \$0.002 - \$0.004/cwt
Current Annual Bulk Tank Average SCC	240,000 SCC per ml	Typical range of 100,000 - 400,000 SCC
Estimated Percent Change in SCC	-5.0 %	Typical range of -10 to +2%

Feed Costs and Intake Changes

Lbs of TMR Dry Matter (DM) per lb of Milk	0.65 lb DM/lb Milk	Typical range of 0.55 - 0.8
Cost per lb of TMR Dry Matter	\$0.105 \$ per lb DM	Typical range of \$0.8 - \$0.14 in 2011
Estimated Change in cost/lb Dry Matter	-\$0.001 \$ per lb DM	Typical range of -\$0.003 to +\$0.003

Culling and Herd Replacement Changes

Cost of Replacement Heifer	\$1,600 \$ per heifer	Typical range of \$1,300 - \$2,200
Cull Price per Cow (or sold for milking purposes)	\$850 \$ per cow	Typical range of \$350 - \$1,200
Expected Change in Annual Turnover Rate	-1 %	Typical change has been very small

Utilities and Supply Changes for Milking

Anticipated Change in Electricity cost	\$8.25 \$/cow/year	Typical increase of 0 - 150 kWh
Anticipated Change in Water cost	-\$3.00 \$/cow/year	Typical range of -\$5 to +\$5
Anticipated Change in Chemicals Cost	\$1.50 \$/cow/year	Typical range of -\$2 to +\$2

The authors have used their best judgement and shall not be liable for any use of this software decision-making aid.