

Determining the Current Cost of Producing Milk in Maine 2010
RFP# 202005708
Maine Department of Agriculture and the Maine Milk Commission

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Introduction: Our research goal was to determine the cost of producing fluid milk for selected dairy farms in Maine that fall into 4 levels of production as defined in statute. We collected detailed economic and production performance data involving onsite financial data collection using consistent performance indicators for all farms.

Process:

- 1) Initial surveys were mailed to all Maine dairy farms that ship milk to a wholesale market in summer of 2010. 316 surveys were sent and 152 producers responded with initial production data, including cropping and accounting procedures that they utilize in their farm system. This represented a response rate of 48%.
- 2) Farms were divided into 5 groups based on production volumes (tiers) and if they shipped to an organic market. The organic farms were not used as part of this study as predetermined by the RFP guidelines.
- 3) Researchers worked with Tim Drake to select the farms from each tier to include in the detailed economic performance data collection process. Numbers from each tier were selected to try and represent the proportion of producers in Maine in each tier.
- 4) Of the 40 farms selected, there were several farms that withdrew from the process, and were replaced with other farms selected by Kersbergen to fit the appropriate tiers. Some of the farms that withdrew were due to personal (health issues) or catastrophic situations (barn collapse)
- 5) Complete data was obtained from 39 farms as represented in Table 1. We have since collected data from some additional farms, but are not included in this summary. From a cursory view, the added data would not change the averages significantly.
- 6) When collating the data, information on labor and compensation was collected for both paid and unpaid (family) labor. Unpaid family labor was not included in the short term/break even analysis, but has been included in the report as it impacts smaller (Tier 1) farms significantly.

- 7) Many of the farms are currently being enrolled in the Cornell Dairy Farm Business Summary as part of the compensation for participating in the process.
- 8) Every attempt was made to decipher milk income from non-milk income. Issues do arise in certain situations where significant forage is sold off the farm and was included as milk income since the forage harvesting is also part of the dairy business.
- 9) Labor costs included are for hired labor only. Corporations were converted to single proprietorships to try and balance the paid labor situation.
- 10) Letters were sent to each farm in the study on June 21st that described each farms' performance and how they compared to others in their respective tier (sample letter attached to the report)
- 11) Data from the Cornell Dairy Farm Business Summary (DFBS), Farm Credit Northeast and Agricultural Resource Management Survey (ARMS) data from the Northern Crescent was evaluated and compared with Maine data collected as part of this study to evaluate accuracy.
- 12) Production costs were evaluated with average increases of 30% in feed grain costs and 44% increase in fuel costs

Table 1.

Characteristics of farms interviewed as part of determining COP 2010

Tier 1	Tier 2	Tier 3	Tier 4
<1.67 million lbs	1.76-4.38 Million lbs	5.63-7.36 million lbs	7.7-17 million lbs
17 farms	11 farms	4 farms	7 farms
30-84 cows	65-250	200-342	353-680
Ave # Cows 54	Ave # Cows 129	Ave # Cows 271	Ave # Cows 454
Ave lbs 885,076	Ave lbs 2,584,821	Ave lbs 6,478,806	Ave lbs 11,249,269

Preliminary ranges for COP by Tier

	Tier1	Tier 2	Tier 3	Tier 4
Short term break even costs (Operating cost)	Average \$19.64	Average \$20.36	Average \$18.01	Average \$17.83
With unpaid family labor ¹	\$25.57	\$21.88	\$18.56	\$18.18

¹Family labor valued at \$10/hr plus \$35,000 return for management and labor for single owner/operator at each farm

Maine Data 2010 MMC study

➤ **Operating Cost of Milk Production**

(Without Unpaid labor and management and depreciation)

Does not include non-milk income

Tier 1	Tier 2	Tier 3	Tier 4	
\$19.64	\$20.36	\$18.01	\$17.83	Ave \$19.35

➤ **Operating Cost of Milk Production plus Depreciation (machinery and facilities)**

Tier 1	Tier 2	Tier 3	Tier 4	
\$21.87	\$22.13	\$19.63	\$19.28	Ave \$22.73

➤ **Operating Cost including unpaid family labor and management (labor valued at \$10/hr)**

Tier 1	Tier 2	Tier 3	Tier 4	
\$25.57	\$21.88	\$18.56	\$18.18	Ave \$22.49

Labor costs describe costs associated with labor hired on a particular farm. These costs have been normalized to a single proprietorship with the chief operator assigned a value of \$35,000 since there may be a "draw" paid from account received (typically via milk checks). Corporations were converted to single proprietorships to get a tier average in this analysis.

➤ **Including unpaid family labor/management and depreciation (Total Cost)**

Tier 1	Tier 2	Tier 3	Tier 4	
\$27.80	\$23.66	\$20.18	\$19.63	Ave \$24.38

➤ **Operating Cost of Production assuming 30% increase in Feed costs and a 44% increase in fuel costs (2010-2011)**

Tier 1	Tier 2	Tier 3	Tier 4	
\$22.25	\$23.76	\$20.78	\$20.60	Ave \$21.85

AMRS Survey Data 2010

Milk production costs and returns per hundredweight (cwt) sold, by State, 2010 1/

Item	Maine	Minnesota	New York	Vermont	All States
Gross value of production:					
Milk sold	18.45	16.18	17.42	17.84	16.25
Cattle	0.86	1.56	1.24	1.05	1.40
Other income 2/	0.79	0.77	0.81	1.01	0.74
Total, gross value of production	20.10	18.51	19.47	19.90	18.39
Operating costs:					
Feed--					
Purchased feed	8.60	5.59	6.40	6.96	8.20
Homegrown harvested feed	1.98	6.20	2.59	1.67	2.88
Grazed feed	0.15	0.05	0.08	0.14	0.09
Total, feed costs	10.73	11.84	9.07	8.77	11.17
Other--					
Veterinary and medicine	1.07	1.37	1.00	0.93	0.95
Bedding and litter	0.39	0.34	0.55	0.44	0.25
Marketing	0.34	0.25	0.27	0.29	0.31
Custom services	0.34	0.36	0.59	0.49	0.50
Fuel, lube, and electricity	0.89	0.85	0.95	0.84	0.70
Repairs	0.92	0.74	0.90	0.62	0.67
Other operating costs 3/	0.01	0.00	0.00	0.00	0.00
Interest on operating capital	0.01	0.02	0.01	0.01	0.01
Total, operating cost	14.70	15.77	13.34	12.39	14.56
Allocated overhead:					
Hired labor	3.15	1.64	2.11	1.90	1.74
Taxes and insurance	0.54	0.27	0.32	0.39	0.24
General farm overhead	1.23	0.70	0.84	1.16	0.57
Total, allocated overhead	4.92	2.61	3.27	3.45	2.55
Total costs listed	19.62	18.38	16.61	15.84	17.11
Value of production less total costs listed	0.48	0.13	2.86	4.06	1.28
Value of production less operating costs	5.40	2.74	6.13	7.51	3.83
Supporting information:					
Milk cows (head per farm)	102	104	132	138	177
Output per cow (pounds)	18,649	19,535	19,289	18,269	19,219
Milking frequency more than twice per day (percent of farms)	2.58	5.69	6.53	7.95	8.18
Milk cows injected with bST (head per farm)	9	21	25	12	30
Organic milk sold (percent of sales)	7.49	0.72	0.40	2.44	0.59

1/ Developed by updating data from the 2005 Agricultural Resource Management Survey of dairy operations using 2010 prices and milk production.

2/ Income from renting or leasing dairy stock to other operations; renting space to other dairy operations; co-op patronage dividends associated with the dairy; assessment rebates, refunds, and other dairy-related resources; and the fertilizer value of manure production.

3/ Costs for third party organic certification

4/ Machinery and equipment, and housing, manure handling, and feed storage structures, and dairy breeding herd.

AMRS Survey Data

Milk production costs and returns per hundredweight sold, by size group, 2010 ^{1/}

Item	Fewer than 50 cows	50-99 cows	200-499 cows	500-999 cows	All Sizes
dollars per cwt sold					
Gross value of production:					
Milk sold	16.44	16.57	16.85	16.22	16.25
Cattle	1.99	1.62	1.18	1.06	1.40
Other income ^{2/}	0.89	0.83	0.74	0.71	0.74
Total, gross value of production	19.32	19.02	18.77	17.99	18.39
Operating costs:					
Feed--	5.96	6.07	7.88	9.08	8.20
Purchased feed	5.24	5.02	3.01	2.62	2.88
Homegrown harvested feed	0.41	0.19	0.10	0.03	0.09
Grazed feed	11.61	11.28	10.99	11.73	11.17
Total, feed costs					
Other--					
Veterinary and medicine	0.87	1.09	1.09	1.03	0.95
Bedding and litter	0.32	0.50	0.30	0.22	0.25
Marketing	0.29	0.32	0.34	0.28	0.31
Custom services	0.47	0.58	0.57	0.57	0.50
Fuel, lube, and electricity	1.01	1.09	0.72	0.65	0.70
Repairs	0.88	1.08	0.70	0.59	0.67
Other operating costs ^{4/}	0.00	0.00	0.00	0.00	0.00
Interest on operating capital	0.02	0.02	0.01	0.02	0.01
Total, operating cost	15.47	15.96	14.72	15.09	14.56
Allocated overhead:					
Hired labor	0.58	0.91	2.11	2.09	1.74
Opportunity cost of unpaid labor	11.67	6.72	1.52	0.60	2.21
Taxes and insurance	0.46	0.40	0.27	0.21	0.24
General farm overhead	1.11	0.84	0.73	0.50	0.57
Total, allocated overhead	13.82	8.87	4.63	3.40	4.76
Total costs listed	29.29	24.83	19.35	18.49	19.32
Supporting information:					
Milk cows (head per farm)	35	69	294	670	177
Output per cow (pounds)	15,005	17,057	19,542	20,898	19,219

^{1/} Developed by updating data from the 2005 Agricultural Resource Management Survey of dairy operations using 2010 prices and milk production.

Discussion:

Collecting this detailed information from farms was made more difficult by the numerous systems each enterprise uses for accounting of costs. Every attempt was made to normalize the costs into categories that could be used for our analysis. Researchers would like to thank the producers who cooperated in the study for all the time and effort they spent dealing with our questions. We would also like to acknowledge the cooperation of Farm Credit, the Farm Service Agency and the National Agricultural Statistics Service.

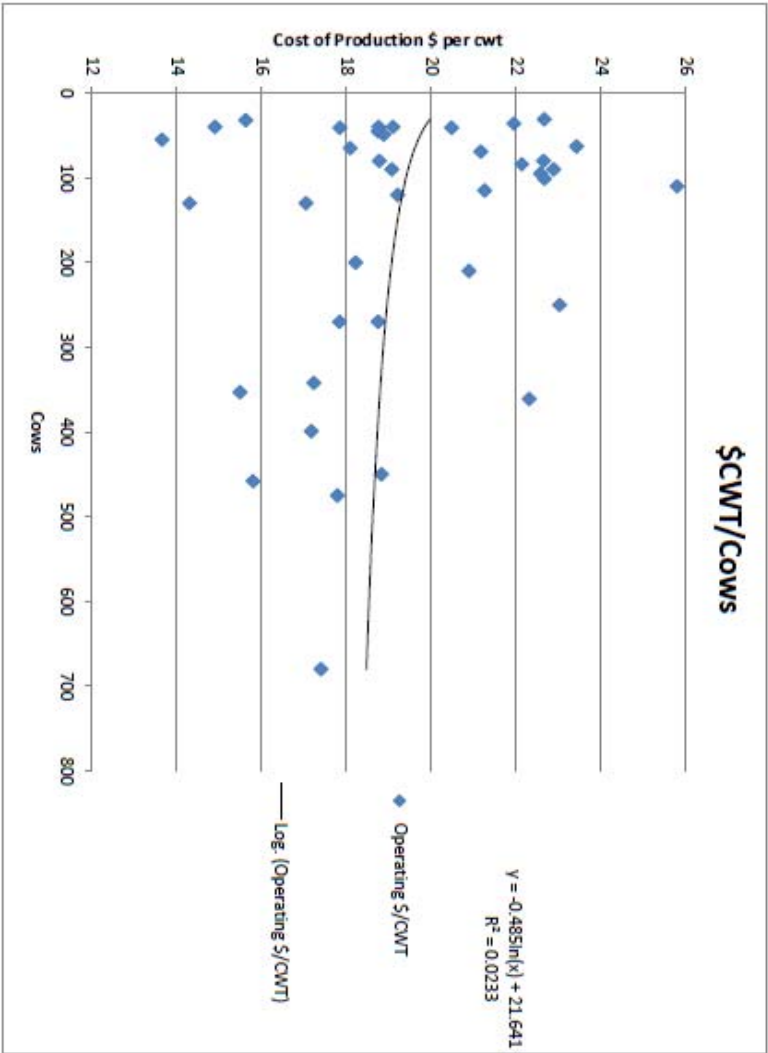
An analysis of the 2010 dairy production year must include a description of the 2009 cropping season. 2009 featured an extremely poor crop season for both cool season grass harvest (quality) and corn (yield and quality). This impacted purchased feed costs throughout the first 5-6 months of 2010. The 2010 cropping year was much improved; however purchased feed costs (corn/soybean prices) began increasing dramatically in the fall of the year and have continued at high levels. The current drought situation in the southwest will probably exacerbate the situation for Maine farmers.

When looking at the comparisons among other COP studies and data, several key areas stand out as higher expenses for Maine farmers. Purchased feed costs remain the single largest expense on most farms and reflect the higher cost of ingredients in Maine as well as the poor forage quality that was harvested in 2009. Labor costs are another benchmark that is higher for Maine farms as compared to other states (New York and Farm Credit studies).

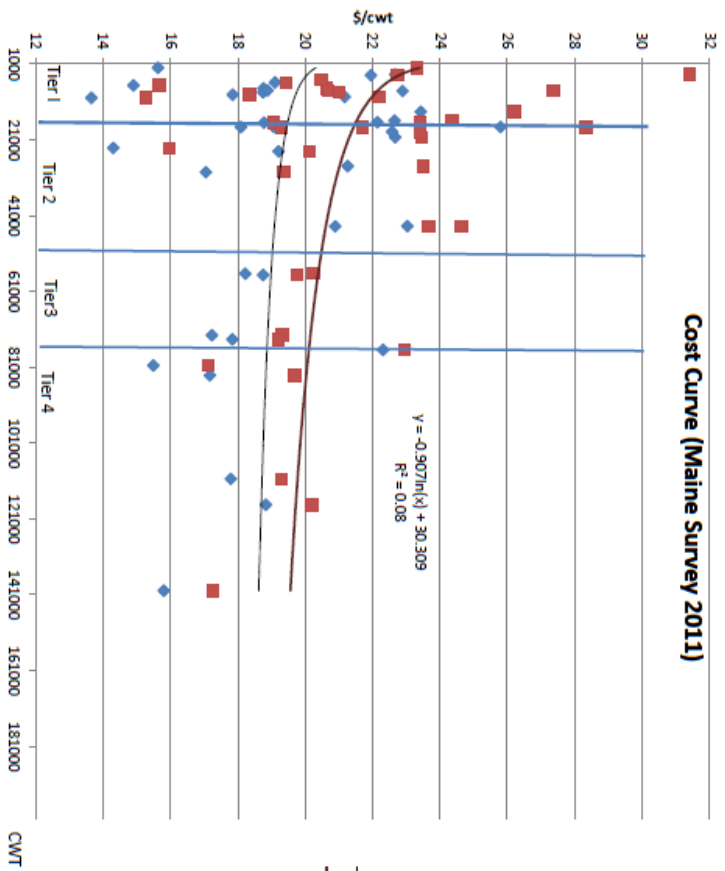
Small farms in the study had a significant amount of unpaid family labor as compared to larger farms. We attempted to account for this by collecting the hours of family farm labor and assigning a wage of \$10/hr. We also assigned a wage of \$35,000 to the owner/operator based on averages from the 2010 Northeast Dairy Farm Summary from Farm Credit. These labor values are not included in the operating costs of production, but are included where indicated. Previous studies (Dalton et.al) have included a value for unpaid labor in the operating cost of production. Not including unpaid family labor in the calculation of the Operating Cost of Production causes the differences in the tiers to be minimized.

When we evaluated the cost of production including depreciation, we can quickly see that farms have not re-invested in new machinery and facilities at a very significant level due to low profit margins in recent years.

We will continue to evaluate the data to identify practices and key management factors that are present in farms with higher profitability and use that information in our education efforts within Extension. Unfortunately, much of the data has a huge degree of variation between tiers and Cost Of Production groups (Low, Medium and High) that we could not find any significant differences in fuel, feed and labor.



Cost Curve (Maine Survey 2011)



Tier I < 16700 cwt

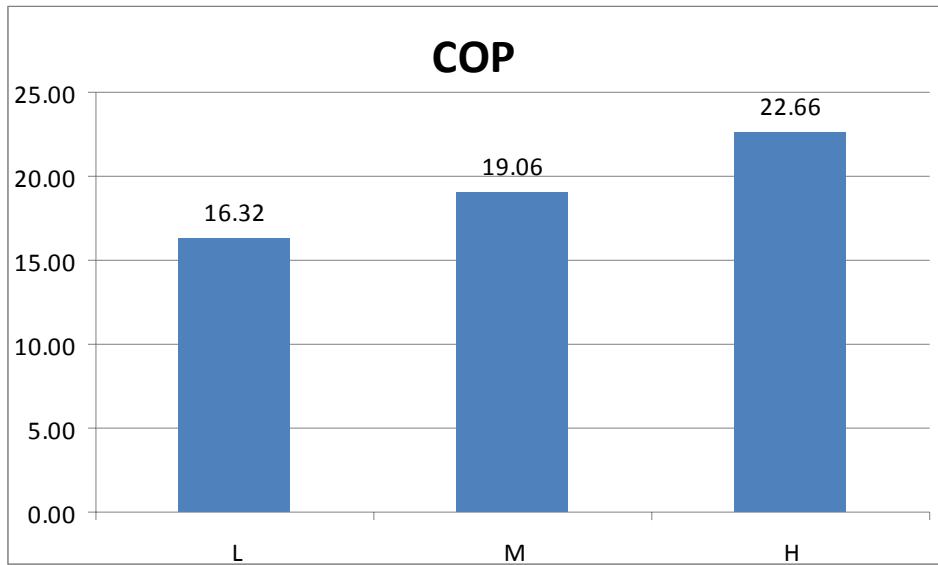
Tier II >16700cwt to 49070 cwt

Tier III > 49070 to 76800 cwt

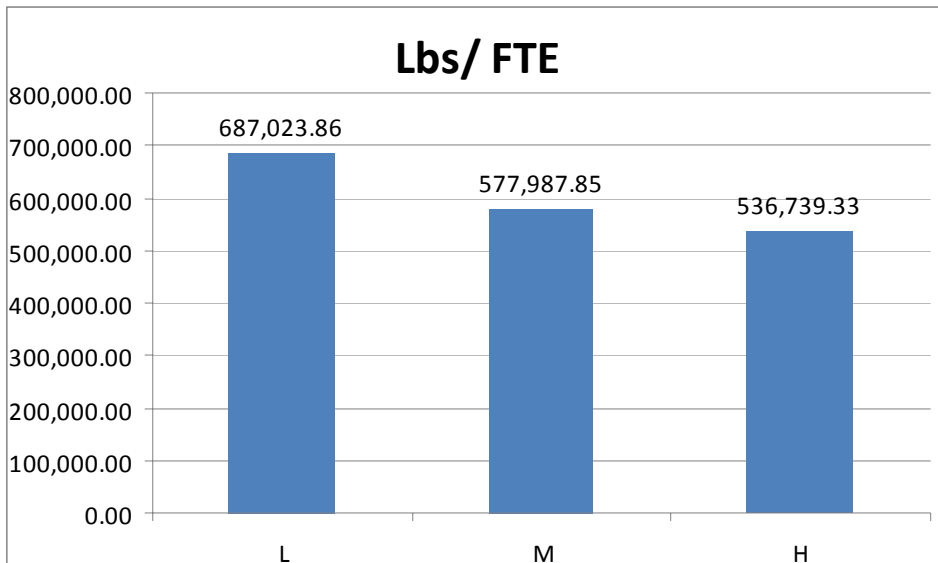
Tier IV > 76800 cwt

- ◆ Operating Costs
- Purchased Input Costs
- Log: (Operating Costs)
- Log: (Purchased Input Costs)

Cost Curve and regression function and goodness of fit relate to the purchased input costs



Farms grouped by low, medium and high cost of production

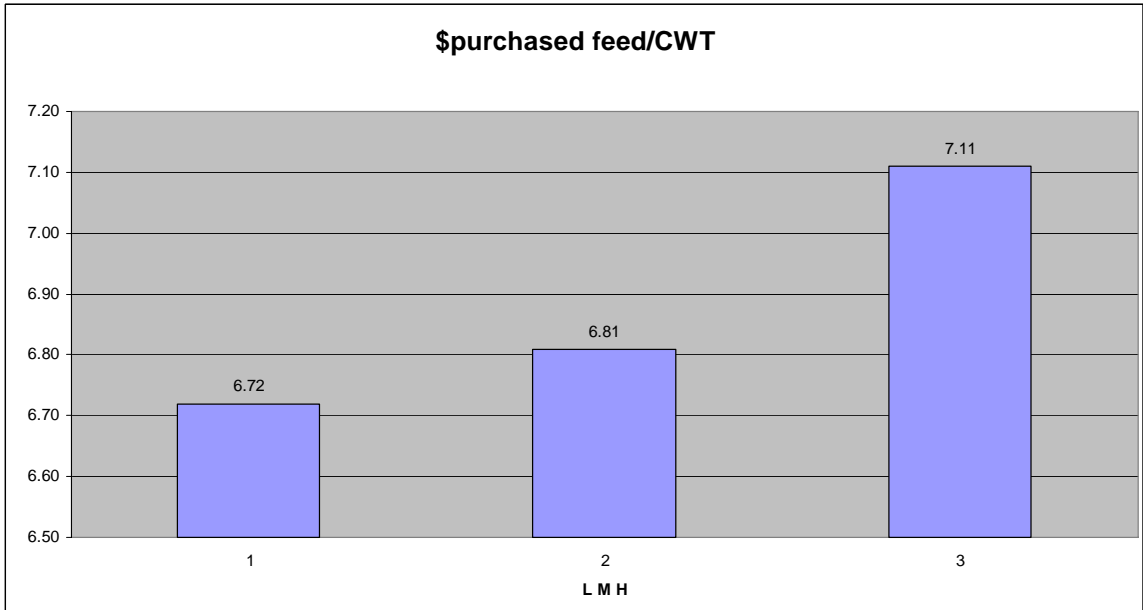


Pounds of milk shipped by low medium and high cost of production per FTE (230 hours/mo of labor)

➤ **Cows per worker**

Tier 1	Tier 2	Tier 3	Tier 4	Ave
23	34	32	40	30

Use 230 hours per month as a full time worker, 12 months per year



Purchased Feed costs per CWT for low (1) Medium (2) and High (3) cost of production farms

