

Organic Dairy Farm Performance, 2020

Iowa Organic and Grass Milk Comparison

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Organic dairy farm performance in 2020 was analyzed on six Iowa dairies, three of which were GRASS MILK dairies. Dairies selected were 1) considered to be good examples of organic dairies in their region and 2) willingness to complete the financial analysis and share information for others to learn. This analysis provides results broken into two categories of Average Organic (**ORG**) and Average Grass Milk (**GM**) dairies. Not all of the ORG dairies sold to the same processor. Similar to other organic data sets, profitability is measured by 1) cost of production per cwt. eq., 2) return on assets and 3) return per hour of unpaid labor.

The ORG dairies average 93 cows and 3.23 productive acres per cow while the GM dairies averaged 66 cows on 4.03 acres per cow. The average assets per cow was \$10,621 and \$24,082 for the ORG and GM dairies, respectively. The large difference is due to a very high percentage of land being rented versus owned in the ORG dairies.

Milk price averaged \$30.12 and \$37.42 for the ORG and GM dairies, respectively. A \$5/cwt. premium is paid on the GM dairies above organic pay price but a difference of \$7.30/cwt. more for the GM herds points to a probability of significantly more jersey/colored breed cows in the GM herds. Milk sales per cow averaged \$3,682 and \$3,263 for the ORG and GM dairies, respectively, a \$419 difference. Typically, when switching to GM from ORG, it would be expected those farms would milk more cows, not less to make up the difference in income per cow with more cows. This is not the case in this ORG and GM dairies comparison.

Other Income and Expense Highlights

Cull cow sales were similar between the ORG and GM groups at \$211 and \$215 per cow, respectively. Calf sales per cow were \$72 and \$62 for the ORG and GM dairies, respectively. Crop sales were \$80 and \$0 for the ORG and GM dairies, respectively as the GM dairies tend not to do much crop work since grains are not part of the picture. Other income was \$536 and \$335 for the ORG and GM farms, respectively. This level was surprising low in 2020 due to the extra government program monies dairies could receive. This is substantially lower (less than half) than 2020 data from MN and WI organic dairy farms on a per cow basis. Total cash incomes were \$4,586 and \$3,874 for the ORG and GM dairies, respectively, a \$712 difference.

Veterinary and medicine expense was \$40 and \$9 for the ORG and GM farms, respectively, as the lower milk production per cow would decrease herd health issues. One dairy mentioned his only vet expense for the year was for the farm dog, not the cows. Grazing type dairies, whether organic or not, have done a great job minimizing vet expenses over the years, hopefully not to their own detriment as might also be missing a good source of herd health advice.

Dairy/farm supplies expense was at \$154 and \$149 per cow, respectively. Breeding fees was \$32 and \$17 per cow for the ORG and GM dairies, respectively. The low levels for both were due to half the herds in the study were predominately bull bred natural service. A caution of farm safety is often raised on these bull bred herds.

Feed purchased was \$625 and \$488 per cow for the ORG and GM dairies, respectively, with 0.8 fewer acres operated per cow on the ORG dairies. But, on a per cwt. equivalent basis, the feed purchased was \$4.15 and \$5.17 for the ORG and GM dairies, respectively. So, even though ORG dairies spent \$137 per cow more, on a per cwt. eq. basis, ORG dairies spent \$1.02 less for purchased feed than their GM counterparts.

Seed and fertilizer expense was \$546 and \$95 for the ORG and GM dairies, respectively. This is significantly lower for the GM dairies primarily because grain production is not an enterprise on the GM dairies. Fuel, gas and oil expense was similar around \$123 per cow. Utilities was \$106 and \$120 per cow for the ORG and GM dairies, respectively. Interest expense is not included as a cash expense in this analysis as all assets, whether owned or borrowed against, are charged an equity charge to even the playing field among farms for profit analysis sake.

Labor hired is often related to size of herd, wage rates, milk production and labor efficiency factors. Hired labor expense per cow was \$122 and \$102 per cow for the ORG and GM farm, respectively, showing these farms rely heavily on owner/operator labor. Rent, lease and hire was \$858 and \$62 per cow for the ORG and GM farms, respectively. The dramatic difference is in large part due to the very high levels of land rented versus owned in the ORG group.

Property taxes per cow were \$29 and \$110 for the ORG and GM farms, respectively, with the large difference for the same reason of high amounts of land rented versus owned. Farm insurance averaged \$51 and \$68 for the ORG and GM farms, respectively. Other cash expenses averaged \$299 and \$175 for the ORG and GM farms, respectively. Total cash expense was \$3,197 and \$1,641 for the ORG and GM farms, respectively, a \$1,556 per cow difference compared to a \$712 difference in cash incomes. Thus, the GM farms made up the difference in lost income plus an additional \$844 in cash expenses. But, again, be cautioned due to the high levels of rented land showing up in ORG cash expenses whereas additional land ownership equity charge has yet to be accounted for in the GM dairies.

Net cash income per cow, less interest paid, was \$1,389 and \$2,223 for the ORG and GM farms, respectively—an \$834 difference. Adjusting for inventory changes gives net farm income per cow of \$972 and \$1,505 for the ORG and GM farms, respectively—a \$533 difference. Equity charges per cow at 4% across all the assets averaged \$428 and \$966 for the ORG and GM farms, respectively, again heavily affected by high land to rent ratio of ORG farms. This gives a return to unpaid labor per cow of \$554 and \$539 for the ORG and GM farms, respectively—a mere \$15 difference.

Labor and Cost of Production Analysis

The net return to unpaid labor does not quantify profit level without further analysis. The number of unpaid full-time equivalents (FTE's) of labor need to be known if profit per FTE or per unpaid labor hour is the goal to compare profit to the labor market. The unpaid labor hours per cow was 54 and 56 for the ORG and GM farms, respectively. The total unpaid FTE's (3,000 hours per FTE annually) was 1.67 and 1.24 for the ORG and GM farms, respectively.

To get to the bottom line on labor is to compare the unpaid labor earnings on a per hour basis. For all the labor, both paid and unpaid, on a per cow basis, the return was \$11.07 and \$11.27 for the ORG and GM, respectively. For the unpaid labor, the return was \$9.89 and \$10.91 for the ORG and GM farms, respectively. If return to labor per hour is the profit goal, the GM dairies had 10% higher labor returns, but in the realm of dairy farm profitability, they are quite similar.

The average cost of production per cwt. equivalent for the ORG farms was \$31.38 with an income of \$30.12 for a net return, all costs included of -\$1.26. The average cost of production per cwt. equivalent for GM farms was \$38.12 with an income of \$37.42 for a net return, all costs included of -\$0.70. This study, along with past studies, have shown the GM farms to be at least as profitable as the ORG and other grazing or confinement type dairies. Again, these are small data sets that hopefully can provide confidence that GM dairies can be competitive with ORG dairies and, dependent on management in both systems, they can both more or less profitable that what is shown in this study.

Efficiencies of Labor, Livestock and Land

Labor productivity is often touted as a most important factor in both profitability and efficient resource use. Return to all labor per FTE was similar \$33,223 and \$33,819 for the ORG and GM farms, respectively. Each FTE is given a cost of \$40,000 per year meaning the ORG farms were short \$6,777 per unpaid FTE employed above break-even. The GM farms were short \$6,181 per unpaid FTE employed to break-even.

The number of cows per FTE was at 50 and 48 for the ORG and GM, respectively, showing similarity on the ORG and GM for labor efficiency per cow. However, on a cwt. of milk sold per FTE, the results were 6,115 and 4,019 for the ORG and GM farms, respectively. Thus, as expected, the GM farms would drop milk production per cow by about a third.

An expected economic response would be to milk more cows in the GM system, but this data shows the GM dairies to actually be smaller in size. But, with only three farms per set one smaller farm in the GM group and one larger farm in the ORG group could heavily contribute to this difference.

Capital costs per cow (depreciation and interest/equity charge) were \$598 and \$1,069 for the ORG and GM farms, respectively. Again, high levels of land rental in the OR farms are evident here as well as in many items that follow. Fixed cost per cow (depreciation, interest, repair, taxes, insurance) were \$891 and \$1,367 for the ORG and GM farms, respectively.

Pounds of milk sold per crop acre averaged 4,081 and 2,460 for the ORG and GM farms, respectively with a low of 1,473 pounds and a high of 5,642 pounds of milk sold per acre operated.

Profit Analysis

The net farm income from operations (NFIFO) is derived by taking cash incomes minus cash expenses, then adjusting it for inventory changes of ending values minus beginning values. This NFIFO has only the opportunity costs of unpaid labor and unpaid equity as the only remaining costs left. Typically, the equity charge is taken out first in order to arrive at a net return to labor (preferably per FTE and per hour worked). The adjusted net farm income was \$90,279 and \$99,307 for the ORG and GM farms, respectively.

The GM dairies outshined the ORG dairies in the profit equation, though both were below a break-even level in profitability. The ORG dairies had a **Return on Assets** (ROA) of 1.25% while the GM dairies averaged 4.25%. The ORG dairies had an **Operating Profit Margin** (OPM) of 4.55% and the GM dairies earned 24.57%. The ORG OPM is quite low for an organic and grazing type dairy.

The ORG dairies did better in the **Asset Turnover Ratio** (ATO) with 59.64% or can basically gross enough income to pay for all the assets owned on the farm in just over three years. Remember, these farms rented land rather than own for the most part. The GM dairies had an ATO at 18.16% or basically gross enough income to pay for all the assets in over five years. An ATO less than three years or less (33%) is good.

$\text{Profit} = (\text{Price} - \text{Cost}) \times \text{Volume}$ or $\text{ROA} = \text{OPM} \times \text{ATO}$

For both the ORG and GM farms, the ROA needs improvement, stemming mostly from the income side of the equation, especially in efficiencies of milk production per cow and per FTE laborer.

The Dairy TRANS Profit Performance Rating, an overall measure of total farm performance was 52.09% and 56.10% for the ORG and GM farms, respectively. Again, realize these are not "average" organic dairy herds in the study as better examples of organic dairy farms were targeted with the study.

In summary, GM dairies continue to show promise. For producers located on lower priced land who are able to have more acres per cow and a milking system to milk more cows with available labor in an efficient manner, GM seems to be worth consideration. The caution is that pasture and other forage management needs to be at a high level when forgoing grain in the ration as energy will be a major limiting factor for GM cows. There are not many stark differences between the ORG and GM dairies profit wise as the increase costs are more than covered by increased incomes in the GM farms.

More detail for various years and regions can be found in other articles within this series. For more information visit the ISU Dairy Team at: www.extension.iastate.edu/dairyteam The Dairy TRANS Financial Analysis software was used for this study. For more information regarding this software and dairy financial analysis, please contact this author.

Iowa Organic Model Farms 2020	Average -- All Farms			Average -- All Farms		
	ORGANIC	/Cow	(3)	GRASS	/Cow	(3)
Productive Crop Acres Operated	300	3.23		266	4.03	
Average Number of Cows	93			66		
Total Assets on Farm	\$985,964	\$10,621		\$1,589,386	\$24,082	
Milk Price	\$30.12			\$37.42		
Milk Hundred weight Equiv.	13,964	150		6,234	94	
Milk Hundredweights	11,554	124		5,863	89	
Milk Sales	\$342,209	\$3,686		\$215,356	\$3,263	
Cull Cow Sales	\$19,602	\$211		\$14,193	\$215	
Calf Sales	\$6,717	\$72		\$4,060	\$62	
Crop Sales	\$7,446	\$80		\$0	\$0	
Other Income	\$49,803	\$536		\$22,098	\$335	
Total Cash Income	\$425,777	\$4,586	/Cwt.Eq.	\$255,707	\$3,874	Cwt.Eq.
Vet and Medicine	\$3,685	\$40	\$0.26	\$581	\$9	\$0.09
Dairy/Farm Supplies	\$14,336	\$154	\$1.03	\$9,865	\$149	\$1.58
Breeding Fees	\$2,926	\$32	\$0.21	\$1,130	\$17	\$0.18
Dairy Feed Purchased	\$57,982	\$625	\$4.15	\$32,218	\$488	\$5.17
Other Feed Purchased	\$0	\$0	\$0.00	\$0	\$0	\$0.00
Repairs	\$19,692	\$212	\$1.41	\$8,172	\$124	\$1.31
Seed, Chem, Fert	\$50,681	\$546	\$3.63	\$6,238	\$95	\$1.00
Fuel, Gas, and Oil	\$11,506	\$124	\$0.82	\$8,075	\$122	\$1.30
Utilities	\$9,816	\$106	\$0.70	\$7,929	\$120	\$1.27
Interest Paid	\$0	\$0	\$0.00	\$0	\$0	\$0.00
Labor Hired	\$11,297	\$122	\$0.81	\$6,746	\$102	\$1.08
Rent, Lease & Hire	\$79,641	\$858	\$5.70	\$4,082	\$62	\$0.65
Property Taxes	\$2,708	\$29	\$0.19	\$7,256	\$110	\$1.16
Farm Insurance	\$4,780	\$51	\$0.34	\$4,476	\$68	\$0.72
Other Cash Expense	\$27,779	\$299	\$1.99	\$11,546	\$175	\$1.85
Total Cash Expense	\$296,830	\$3,197	\$21.26	\$108,314	\$1,641	\$17.37
Net Cash Income	\$128,946	\$1,389	\$9.23	\$147,393	\$2,233	\$23.64
Inventory Change	-\$38,667	-\$417	-\$2.77	-\$48,085	-\$729	-\$7.71
Net Farm Income	\$90,279	\$972	\$6.47	\$99,307	\$1,505	\$15.93
Equity @ 4%	\$39,745	\$428	\$2.85	\$63,765	\$966	\$10.23
Return to Labor	\$50,534	\$544	\$3.62	\$35,542	\$539	\$5.70
Accounts Receivable	\$0			\$0		
Feed Inventory	-\$16,468	-\$177	-\$1.18	-\$4,702	-\$71	-\$0.75
Supplies and Other	-\$10,621	-\$114	-\$0.76	\$9	\$0	\$0.00
Breeding Livestock	\$13,280	\$143	\$0.95	-\$21,700	-\$329	-\$3.48
Income Change	-\$13,809	-\$149	-\$0.99	-\$26,393	-\$400	-\$4.23
Prepaid Expenses	\$0	\$0	\$0.00	\$480	\$7	\$0.08
Accounts Payable	\$0	\$0	\$0.00	\$0	\$0	\$0.00
Machinery & Equipment	-\$3,417	-\$37	-\$0.24	\$6,415	\$97	\$1.03
Land and Buildings	\$2,902	\$31	\$0.21	\$9,986	\$151	\$1.60
Other Adjustments	-\$1,023	-\$11	-\$0.07	\$30	\$0	\$0.00
Expense Change	\$1,539	\$17	\$0.11	-\$16,911	-\$256	-\$2.71
Capital Purchases Minus Sales Adj.	\$23,319	\$251	\$1.67	\$38,603	\$585	\$6.19
Depreciation FM Value	\$17,868	\$192	\$1.28	\$15,969	\$242	\$2.56
Unpaid Labor Cost	\$66,667	\$718	\$4.77	\$48,333	\$732	\$7.75
Unpaid Labor Hours	5,000	54		3,717	56	
Unpaid Labor FTE's	1.67			1.24		
Total FTE's (=3000 hrs/yr)	1.88			1.42		
All Labor Earnings/Hour	\$11.07			\$11.27		
Unpaid Labor Earnings/Hr	\$9.89			\$10.91		

Iowa Organic Model Farms 2020	Average -- All Farms			Average -- All Farms		
	ORGANIC	/Cow	(3)	GRASS	/Cow	(3)
Cash Income	\$425,777	\$4,586		\$255,707	\$3,874	
+ Inventory (Feed, Livestock, Supplies)	-\$13,809	-\$149		-\$26,393	-\$400	
Total Income	\$411,968	\$4,438		\$229,314	\$3,474	
Cash Costs	\$296,830	\$3,197		\$108,314	\$1,641	
+ Inventory Costs (Accts Pay, Prepaid, Dep	\$24,858	\$268		\$21,692	\$329	
+ Overhead Costs (Opp Cost Labor&Equity)	\$106,412	\$1,146		\$112,098	\$1,698	
Total Costs	\$428,101	\$4,611		\$242,105	\$3,668	
Net Profit Return Over Costs	-\$16,133	-\$174		-\$12,791	-\$194	
Income per Cwt. of Milk Sold	\$30.12			\$37.42		
Expense per Cwt. Equivalent	\$31.38			\$38.12		
Net Income per Cwt.Eq.	-\$1.26			-\$0.70		
Adjusted Gross Return per FTE Labor...	\$216,921			\$160,115		
Return to All Labor per FTE Labor.....	\$33,223			\$33,819		
Number of Cows per FTE Labor.....	50			48		
Cwts. of Milk Sold per FTE Labor.....	6,115			4,019		
All Labor Costs per Cow.....	839			843		
Pounds of Milk Sold per Cow.....	12,582			8,415		
Capital Invested per Cow.....	8,705			21,030		
Capital Cost per Cow.....	\$598			\$1,069		
Fixed Cost per Cow (DIRTI)	\$891			\$1,367		
Net Farm Income per Crop Acre.....	\$301			\$433		
Lbs. Milk Produced per Crop Acre.....	4,081			2,460		
Adj. Gross Cash Income/Crop Acre.....	\$1,435			\$1,015		
Machinery Investment/Crop Acre	\$624			\$772		
Fuel, Gas and Oil Cost/Crop Acre.....	\$40			\$33		
Repair Cost per Crop Acre.....	\$75			\$42		
Fert/Chem/Seed Cost/Crop Acre.....	\$158			\$32		
Livestock over Total Investment %	31.65%			11.27%		
Cash Exp./Cash Inc.w/o Labor&Int.....	67.36%			41.06%		
All Labor as Percent of Total Costs.....	18.58%			24.77%		
Fixed Cost as Percent of Total Cost.....	18.44%			40.73%		
**Net Farm Income From Operations	\$90,279			\$99,307		
**Rate of Return on Assets.....	1.25%			4.25%		
**Rate of Return on Equity.....	1.25%			4.25%		
**Operating Profit Margin.....	4.55%			24.57%		
**Asset Turnover Ratio.....	59.64%			18.16%		
**Operating Expense Ratio.....	75.09%			47.96%		
**Depreciation Expense Ratio.....	3.97%			6.25%		
**Net Farm Income Ratio.....	20.94%			45.79%		
Dairy TRANS Profit Status is.....						
Dairy TRANS Performance Rating	52.09%			56.10%		

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***Note:** The "average" is calculated as the sum of the individual farms for each item, not a previous item's sum divided by another item's sum, which yields slightly different results.

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