

Managing Dairy Farm Finances

Dairy Economics 101



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How Do You Manage Dairy Farm Finances?



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Economics = How Do You Satisfy Your Needs and Wants,
Not Just Financial, But Quality of Life **50%**



**Every Farm is Different in
Labor, Feed, Land and
Facility Resources**

Managing Dairy Farm Finances

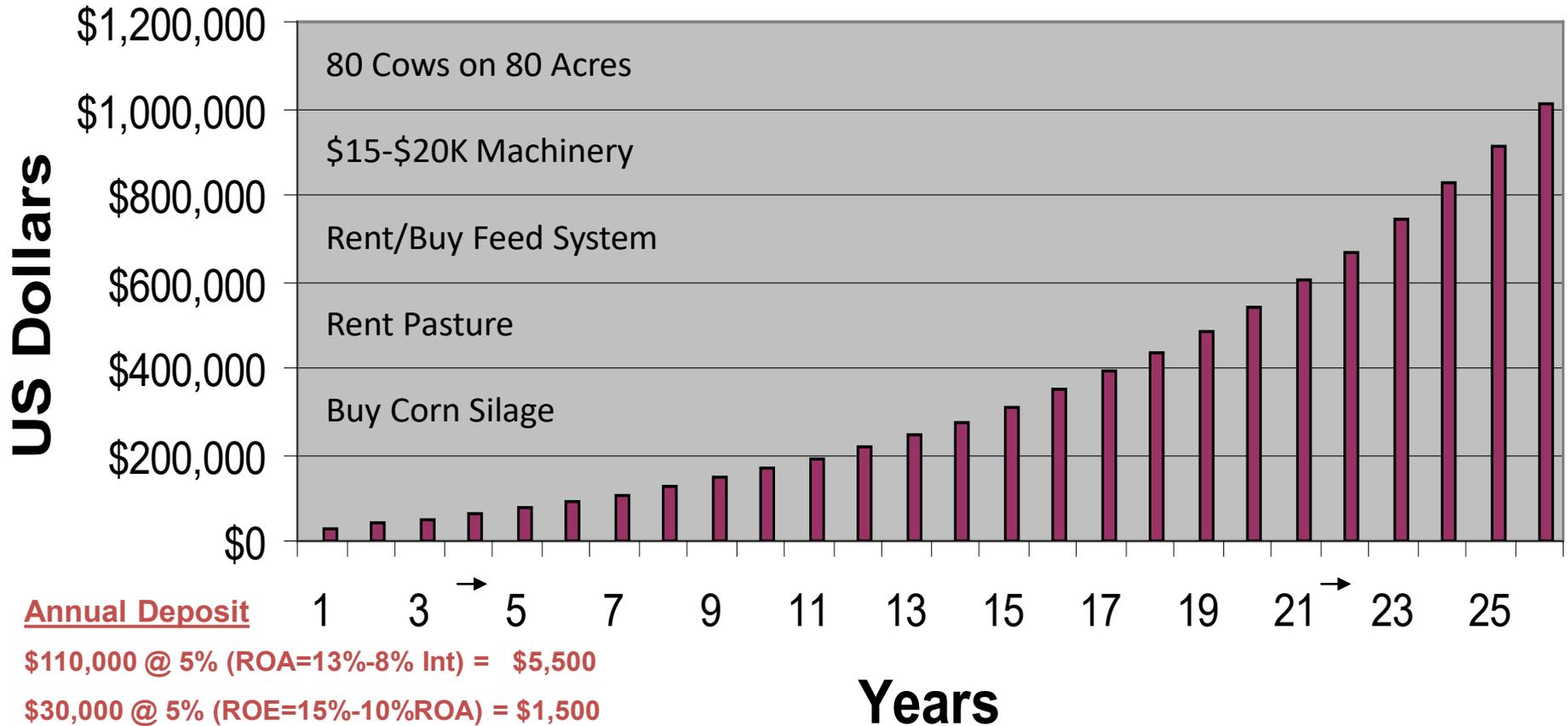
1. **Profitability**: cover costs + accumulate wealth <45
2. **Solvency**: *avoid losses*—wealth reduction/time >45
3. **Liquidity**: + **cash flow** in financial obligations <45
4. **Psychological Income**: + quality of life <45>

$$\text{Profit} = (\text{Price} - \text{Cost}) \times \text{Volume}$$

$$\text{ROA} = \text{Operating Profit Margin} \times \text{Asset Turnover Ratio}$$

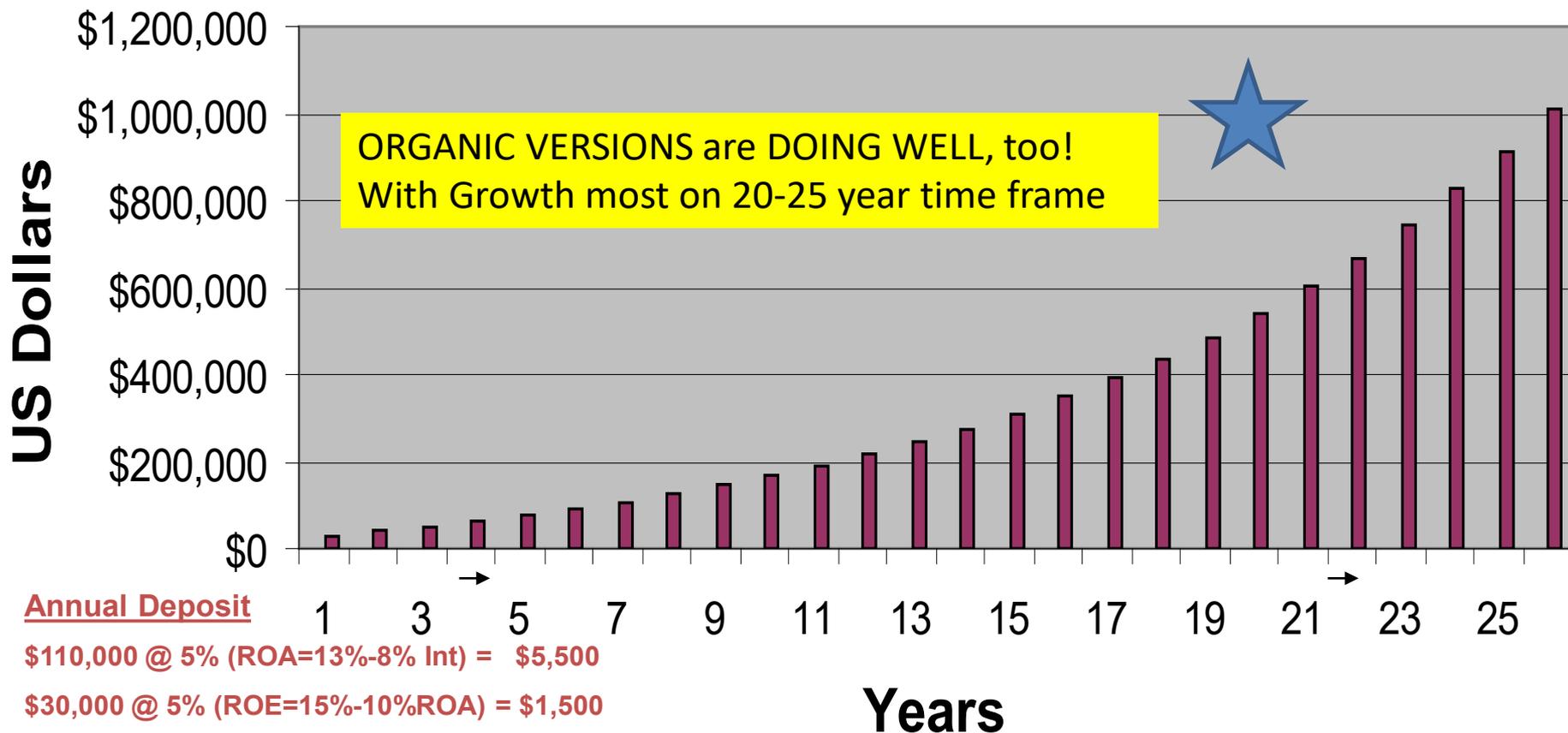
Dairy Farm Millionaires

Beginning Principal = \$30,000; Annual Deposit = \$7,000; NW ROA = 10%



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Managing Dairy Farm Finances

1. Acknowledge Weaknesses:::Focus on Strengths
2. Turn Data into Information and Information into Knowledge to make **INFORMED** decisions.
3. Adjust CASH (tax) Records with ACCRUAL Inventory (Balance Sheet) to accurately analyze your business.
4. Know Your Cost of Production and your *relative* Per Person, Per Acre and Per Cow Efficiencies.

Net Farm Income from Operations (NFIFO)

= Cash Farm Income

- Cash Farm Expenses

= **Net Cash Farm Income** (+150/cow)

+ Prepaid Expense Adjustment (End-Beg)

- Accounts Payable Adjustment

+ Feed Inventory Adjustment

+ Livestock Inventory Adjustment

- Depreciation

= **NFIFO**

Goal: Opportunity Cost
of Labor and Capital

Big Three of Financial Statements

1. Net Worth Statement – Snapshot B4 & After;
*****Distance b/w You and Insolvency** (still picture)
2. Net Farm Income Statement—How did you get from Beg to Year-End in the farm business? (farm video)
3. Cash Flow Statement—all sources and uses of cash both farm and non-farm. (farm and home video)
Lenders put more stock in cash flowability than your profitability)

1. Net Worth Statement – Snapshot B4 & After;

*****Distance b/w You and Insolvency** (still picture)

**** Date of the Net Worth Statement is crucial** and needs to coincide with your tax/accounting period. So, if January 1-December 31 is your accounting year, what can happen if your Net Worth Statement is done on January 15th? Lots of inventory (non-cash) changes could happen that could skew accuracy.

Farm ASSETS (what you own)

Current

Cash, Savings	\$7,500
Feed on hand	\$35,000
Acct. Receivables	<u>\$6,000</u>

Total Current **\$48,500**

Non-Current

Cows /Heifers	\$167,000
Machinery/Eq.	\$103,000
Buildings/Land	<u>\$330,000</u>

Total Non-Current **\$600,000**

Total Assets **\$648,500**

Farm LIABILITIES (debt you owe)

Current

Taxes Due	\$2,350
Accts Payable	\$22,000
Principal Due	<u>\$12,500</u>

\$36,850

Non-Current

Dairy Bank	\$142,000
Creamy Creditor	\$119,000
Land Contract	<u>\$69,000</u>

\$330,000

Total Liabilities **\$366,850** *57% D/Asset*

****JAN 1, 2009**

\$11,650 WC
1.32 CR

Assets – Liabilities = Net Worth

\$648,500 - \$366,850 = \$281,650

Managing Dairy Farm Finances

Solvency measures the amount of borrowed capital relative to owner's equity. **Principal payments are a necessary investment, not an expense into the farm business.**

The banker needs their money back (with interest) so solvency is as important as liquidity in long run. Can principal be delayed?

Solvency Measures

\$500,000 Assets; \$275,000 Debt

- 1. Debt/Asset Ratio = $\frac{\text{Total Farm Liabilities}}{\text{Total Farm Assets}}$ 55%**
Goal: < 40%
- 2. Equity/Asset Ratio = $\frac{\text{Total Farm Equity}}{\text{Total Farm Assets}}$ 45%**
Goal: > 60%
- 3. Debt/Equity Ratio = $\frac{\text{Total Farm Liabilities}}{\text{Total Farm Equity}}$ 85%**
Goal: < 67%

Managing Dairy Farm Finances

Financial Efficiency

...measures the intensity a business uses its assets to generate gross revenue and effectiveness of production, pricing, financing and marketing....

**...how well does the business do business....
is the business leaving money on the table?**

What Makes Pasture Dairies Profitable?

Minimalist Thinking

What's the Least I can Do to get by?

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(Pastoral Psychologist)

Dairy Field Specialist
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Optimalist Thinking

Are we leaving Money on Table with less?



Profitability and Financial Efficiency:

$$\text{Profit} = (\text{Price} - \text{Cost}) \times \text{Volume}$$

1. **Operating Profit Margin:**
$$\frac{\text{NFIFO} + \text{Int. Pd} - \text{Unpaid Labor}}{\text{Gross Revenue}}$$

Goal > 25%

2. **Asset Turnover Ratio:**
$$\frac{\text{Gross Revenue}}{\text{Ave. Total Farm Assets}}$$

Goal: > 33%

Gross enough to pay for all assets in 3 years

Profitability and Financial Efficiency:

$$3. \text{ Return on Assets} = \frac{\text{NFIFO} + \text{Interest Pd} - \text{Unpaid Labor}}{\text{Average Total Farm Assets}}$$

Goal: > Interest % you are paying bank

$$4. \text{ Return on Equity} = \frac{\text{NFIFO} - \text{Unpaid Labor}}{\text{Average Total Farm Equity}} \quad \text{Goal: } > \text{Opp}$$

$$\text{Operating Profit Margin} * \text{Asset Turnover Ratio} \\ = \text{Rate of Return on Assets}$$

What should a dairy producer know?

1. Differences between Profit and Cash Flow
2. Production efficiencies (per cow, per **labor** FTE and per acre) and financial benchmarks.
3. Know how to keep the records needed to calculate the measures.
4. Interpret the measures to make informed decisions! Business and Cash Flow Plans for creditors

CASH FLOW STATEMENT

Beginning Cash Balance			\$20,000
Non-farm Income			\$0
Income Taxes Paid			\$48,000
Principal Payments			\$0
Family Living Expenses			\$40,000
Capital Purchases			\$16,176
Capital Sales (exclude cull cows sales)			\$0
New Monies (from loans, savings, ect.)			\$0
Net Farm Cash Income			\$95,325
Ending Cash Flow	3.39%	\$11,149	>10%

Understand “How to” properly analyze a Dairy for “Profits”

Best to use a combination of:

1. Rate of Return to Assets (marries net worth statement and net farm income statement)
2. Milk production costs per cwt. Equivalent
3. Return to Unpaid Labor per hour (after equity charge)

Dairy Farm Profits are Analyzed through ISU Extension's Dairy TRANS Software

Dairy TRANS 4.44 – Inputs:

- *Net Worth Statement Beginning and End*
- *Schedule F and Cash Flow Items*
- *Cows, Acres and Labor Hours*

Dairy TRANS 4.44 – Outputs:

- *Net Farm Income & Cash Flow Statement*
- *Cost of Production, Ratios, Benchmarks*
- *Efficiencies of Resource Use per cow, cwt.eq., acre, FTE Laborer*

Do NOT use Schedule F, Net Cash Income or even Net Farm Income Adjusted for Inventory to compare profits!!!!

Unfair due to: 1) Hired vs Unpaid Labor 2) Interest pd vs Equity chg

PER COW	CONV	HGRAZ	ORG	ORG-NG
Adj. Net Farm Income:	\$650	\$850	\$900	\$950
Interest	\$450	\$250	\$125	\$100
Equity Charge	\$150	\$150	\$450	\$425
Hired Labor	\$450	\$150	\$75	\$0
Unpaid Labor	\$100	\$300	\$450	\$450
NET Return after Unpaid Labor and Equity Charge:	\$400	\$500	\$0	\$75

Table 1.

System Compare	Conv	Grz	C vs. G	Org	G vs. O	2015
Milk Price	2011	\$20.08	\$20.81	4%	\$27.20	31%
	2012	\$19.49	\$20.77	7%	\$29.47	42%
	2013	\$20.29	\$20.48	1%	\$30.36	48%
	3 YR Average	\$19.95	\$20.69	4%	\$29.01	40%
						\$17 vs \$34
						100%
3YR Ave Milk/Cow		23,568	15,366	-35%	14,009	-9%

Net Farm Income	2011	\$706	\$792	12%	\$753	-5%
	2012	\$634	\$556	-12%	\$1,040	87%
	2013	\$533	\$669	26%	\$785	17%
	3 YR Average	\$624	\$672	8%	\$859	28%
Equity Charge		?	?		?	
Return to Labor		?	?		?	

Organic Dairy Farms	Average of All 10 Farms		Average 4 Larger Farms		Average 6 Smaller Farms	
Anchor Farms 2016	80-518 cows	/Cow	240-515 cows	/Cow	80-125 cows	/Cow
Productive Crop Acres Operated	940	4.51	1658	4.54	461	4.44
Average Number of Cows	208		365		104	
Total Assets on Farm	\$4,611,505	\$22,128	\$8,955,616	\$24,519	\$1,715,430	\$16,521
Milk Price	\$34.19		\$34.09		\$34.25	
Milk Hundred weight Equiv.	39,938	192	70,747	194	19,398	187
Milk Hundredweights	34,335	165	61,610	169	16,153	156
Milk Sales	\$1,172,698	\$5,627	\$2,100,446	\$5,751	\$554,200	\$5,337
Cull Cow Sales	\$46,794	\$225	\$96,157	\$263	\$13,886	\$134
Calf Sales	\$17,243	\$83	\$32,288	\$88	\$7,213	\$69
Crop Sales	\$52,141	\$250	\$96,525	\$264	\$22,552	\$217
Other Income	\$50,990	\$245	\$90,664	\$248	\$24,541	\$236
Total Cash Income	\$1,339,867	\$6,429	\$2,416,080	\$6,615	\$622,391	\$5,994
		/Cwt.Eq.		Cwt.Eq.		/Cwt.Eq.

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Organic Dairy Farms Anchor Farms 2016	Average of All 10 Farms			Average 4 Larger Farms			Average 6 Smaller Farms		
	80-518 cows	/Cow		240-515 cows	/Cow		80-125 cows	/Cow	
Veterinary, Medicine	\$15,835	\$76	\$0.40	\$24,531	\$67	\$0.35	\$10,038	\$97	\$0.52
Dairy Supplies ★	\$47,454	\$228	\$1.19	\$73,277	\$201	\$1.04	\$30,239	\$291	\$1.56
Breeding Fees	\$11,205	\$54	\$0.28	\$21,574	\$59	\$0.30	\$4,292	\$41	\$0.22
Feed Purchased	\$142,620	\$684	\$3.57	\$222,648	\$610	\$3.15	\$89,269	\$860	\$4.60
Repairs ★	\$89,442	\$429	\$2.24	\$169,822	\$465	\$2.40	\$35,856	\$345	\$1.85
Seed, Chem, Fert	\$98,105	\$471	\$2.46	\$198,369	\$543	\$2.80	\$31,263	\$301	\$1.61
Fuel, Gas, and Oil	\$32,131	\$154	\$0.80	\$58,364	\$160	\$0.82	\$14,642	\$141	\$0.75
Utilities	\$20,431	\$98	\$0.51	\$30,588	\$84	\$0.43	\$13,660	\$132	\$0.70
Interest Paid -- not included	\$0			\$0		\$0.00	\$0		\$0.00
Labor Hired	\$156,600	\$751	\$3.92	\$334,163	\$915	\$4.72	\$38,224	\$368	\$1.97
Rent, Lease and Hire	\$143,516	\$689	\$3.59	\$244,030	\$668	\$3.45	\$76,507	\$737	\$3.94
Property Taxes	\$11,466	\$55	\$0.29	\$21,007	\$58	\$0.30	\$5,105	\$49	\$0.26
Farm Insurance	\$23,148	\$111	\$0.58	\$41,930	\$115	\$0.59	\$10,627	\$102	\$0.55
Other Cash Expense ★	\$96,441	\$463	\$2.41	\$191,560	\$524	\$2.71	\$33,028	\$318	\$1.70
Total Cash Expense	\$888,393	\$4,263	\$22.24	\$1,631,861	\$4,468	\$23.07	\$392,748	\$3,782	\$20.25

Organic Dairy Farms Anchor Farms 2016	Average of All 10 Farms			Average 4 Larger Farms			Average 6 Smaller Farms		
	80-518 cows	/Cow		240-515 cows	/Cow		80-125 cows	/Cow	
Net Cash Income	\$451,474	\$2,166	\$11.30	\$784,219	\$2,147	\$11.08	\$229,644	\$2,212	\$11.84
Inventory Change	-\$38,604	-\$185	-\$0.97	-\$98,267	-\$269	-\$1.39	\$1,172	\$11	\$0.06
Net Farm Income	\$412,870	\$1,981	\$10.34	\$685,952	\$1,878	\$9.70	\$230,816	\$2,223	\$11.90
Equity@	\$182,714	\$877	\$4.57	\$357,396	\$978	\$5.05	\$66,260	\$638	\$3.42
Return to Labor	\$230,156	\$1,104	\$5.76	\$328,555	\$900	\$4.64	\$164,556	\$1,585	\$8.48

How Would Interest vs Equity Charge affect NFI?

How Would Renting vs Owning affect NFI?

How Would Paid vs Unpaid Labor affect NFI?

Organic Dairy Farms Anchor Farms 2016	Average of All 10 Farms			Average 4 Larger Farms			Average 6 Smaller Farms		
	80-518 cows	/Cow		240-515 cows	/Cow		80-125 cows	/Cow	
Return to Labor	\$230,156	\$1,104	\$5.76	\$328,555	\$900	\$4.64	\$164,556	\$1,585	\$8.48
Unpaid Labor Cost	\$83,000	\$398	\$2.08	\$107,500	\$294	\$1.52	\$66,667	\$642	\$3.44
Unpaid Labor Hours	6,898	33		9,195	25		5,367	52	
Labor Full Time Equivalents	5.53			9.75			2.72		
Labor Earnings Per Hour	\$34.14			\$37.58			\$31.85		
Adj. Gross Return per FTE Labor.....	\$250,060			\$239,079			\$257,381		
Return to All Labor per FTE Labor.....	\$74,625			\$67,559			\$79,335		
Number of Cows per FTE Labor.....	39			37			41		
Cwts. of Milk Sold per FTE Labor.....	6,247			6,066			6,369		
All Labor Costs per Cow.....	\$1,099			\$1,233			\$1,010		
All Labor as Percent of Total Costs.....	19.97%			21.92%			18.67%		

The Return to All Labor per Hour Worked was **\$23.31** for the AVERAGE herd; **\$22.65** for the LARGER herds; and **\$24.85** for the SMALLER herds--**\$2.20 more!**

Organic Dairy Farms Anchor Farms 2016	Average of All 10 Farms		Average 4 Larger Farms		Average 6 Smaller Farms	
	80-518 cows	/Cow	240-515 cows	/Cow	80-125 cows	/Cow
Pounds of Milk Sold per Cow.....	16,044		16,384		15,816	
Productive Crop Acres per Cow.....	4.58		4.62		4.55	
Capital Cost per Cow.....	\$1,030		\$1,242		\$889	
All Labor Costs per Cow.....	\$1,099		\$1,233		\$1,010	
Fixed Cost per Cow (DIRTI)	\$1,569		\$1,830		\$1,395	
Capital Invested per Cow.....	\$17,449		\$21,488		\$14,757	
Net Farm Income per Crop Acre.....	\$491		\$414		\$543	
Lbs. Milk Produced per Crop Acre.....	3,742		3,681		3,783	

Two of the Smaller Farms rented a significant portion of their assets in the way of facilities and land.

Organic Dairy Farms Anchor Farms 2016	Average of All 10 Farms		Average 4 Larger Farms		Average 6 Smaller Farms	
	80-518 cows	/Cow	240-515 cows	/Cow	80-125 cows	/Cow
All Labor as Percent of Total Costs.....	19.97%		21.92%		18.67%	
Fixed Cost as Percent of Total Cost.....	27.67%		30.99%		25.45%	
**Net Farm Income From Operations	\$412,870		\$685,952		\$230,816	
**Rate of Return on Assets.....	9.84%		6.97%		11.75%	Rented Farms Impact ROA and ATO and OPM
**Rate of Return on Equity.....	9.95%		6.97%		11.93%	
**Operating Profit Margin.....	25.16%		24.80%		25.39%	
**Asset Turnover Ratio.....	39.85%		27.92%		47.80%	
**Operating Expense Ratio.....	62.71%		65.14%		61.08%	
**Depreciation Expense Ratio.....	4.04%		4.71%		3.60%	
**Net Farm Income Ratio.....	33.20%		30.00%		35.33%	
Dairy TRANS Profit Status is.....	Average to Superb		Average/Superb		Average/Good/Great	
Dairy TRANS Performance Rating	76.10%		63.50%		84.50%	

Profit = (Price-Cost) x Volume

ROA = OPM x ATO

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The ISU Extension Dairy Budgets

- *Nine Organic Budgets*
- *Eight Pasture and Conventional Budgets*
- www.extension.iastate.edu/dairyteam
- *tranel@iastate.edu*

DAIRY TRANS Profit Performance Rating	Yours	Goal	Average	Rank
Adjusted Gross Return per FTE Labor.....	\$169,535	\$135,000	\$75,000	100%
Return to All Labor per FTE Labor.....	\$30,717	\$40,000	\$20,000	54%
Number of Cows per FTE Labor.....	65	64	40	100%
Cwts. of Milk Sold per FTE Labor.....	10,513	10,000	6,500	100%
Pounds of Milk Sold per Cow.....	16,174	22,000	18,000	0%
Total Debt per Cow.....	\$0	\$2,500	\$4,000	100%
Productive Crop Acres per Cow.....	1.2	2.5	3.5	100%
Capital Cost per Cow..... \$8,267 Invested/cow.....	\$523	\$500	\$850	93%
All Labor Costs per Cow.....	\$471	\$500	\$800	100%
Fixed Cost per Cow (depreciation, interest, repair, taxes, insurance)	\$706	\$700	\$1,200	99%
Net Farm Income per Crop Acre.....	\$626	\$600	\$125	100%
Pounds of Milk Produced per Crop Acre.....	13,141	8,000	5,000	100%
Adjusted Gross Cash Income per Crop Acre.....	\$2,119	\$1,000	\$600	100%
Machinery FMV per Crop Acre.....	\$1,391	\$500	\$650	0%
Fuel, Gas and Oil Cost per Crop Acre.....	\$71	\$30	\$35	0%
Repair Cost per Crop Acre.....	\$83	\$30	\$45	0%
Fert/Lime/Chem/Seed Cost per Crop Acre.....	\$40	\$65	\$85	100%

The "Sweet 16" of Financial Ratios as determined by the National Farm Financial Standards Task Force

**Net Farm Income From Operations (NFIFO).....		\$100,151	\$50,000	\$20,000	100%
**Rate of Return on Assets..... 0.1% Paid..*		5.02%	12.0%	5.0%	0%
**Rate of Return on Equity..... [1-5 Profit Ratios].....		5.02%	15.0%	5.0%	0%
**Operating Profit Margin.....		17.74%	25.0%	15.0%	27%
**Asset Turnover Ratio..... 3.5 years.....		28%	45%	30%	0%
**Operating Expense Ratio..... [4 Efficiency Ratios].....		68%	50%	60%	0%
**Depreciation Expense Ratio.....		2%	10%	15%	100%
**Interest Expense Ratio.....		0%	10%	15%	100%
**Net Farm Income Ratio..... 100%		30%	35%	25%	45%
**Current Ratio..... [2 Liquidity Ratios].....		116120.00	1.75	1.25	100%
**Working Capital..... [Goal=Family Living+Principal;Ave=half].....		\$132,787	\$40,000	\$20,000	100%
**Debt/Asset Ratio..[Solvency]...Begin... 0%	End	0%	40%	50%	100%
**Equity/Asset Ratio.....Begin... 100%	End	100%	60%	50%	100%
**Debt/Equity Ratio.....Begin... 0%	End	0%	67%	80%	100%
**Debt & Capital Lease Coverage Ratio... [2 Repay Capacity Ratios]...	20151290.00	2.3	Profit Status is		
**Debt & Capital Replacement Margin.....	\$20,151	GOOD			66%

Operating Profit Margin 17.74% x **Asset Turnover Ratio** 28.28% = **Asset Return Rate** 5.02%

So, in Managing Dairy Farm Finances we learn:

- 1) Profitability Issues**
- 2) Liquidity/Cash Flow Issues**
- 3) Solvency Issues**
- 4) Production & Financial Performance Measures**
- 5) Benchmark Data**
- 6) Lender Concerns**
- 7) What You Need to Know**

**Now, What Do You Need to Do to Better
Manage Dairy Farm Finances?**

So, here's my advice on how to start?

- 1) Put together a Jan 1st & Dec 31st Net Worth Statement**
- 2) Do an Dairy TRANS Analysis of the last previous full year using Schedule F incomes and expenses to give you a base year showing how you did in a full year.**
- 3) Project a CASH FLOW for the current year using data to date and projecting out how the current year may end up using futures milk prices as a guide.**

So, what should a dairy producer do? (cont.)

4) Or do a FINPACK (FINAN) financial projection for the rest of the current year.

5) Get together with Extension Dairy Team member for Dairy TRANS analysis or a FINPACK associate for the FINAN program.

6) Besides preparing financial records for your banker, show your production records ...show 3-5 years worth of records that illustrate you are not only good financial manager, but also a good herd & production managers.

What do you need for a Dairy TRANS Analysis?

- 1) A Beg & End Balance Sheet is needed**
- 2) Schedule F has income and expenses**
- 3) Cash Flow data for the most part is not necessary for a profitability analysis except for capital purchases and sales.**
- 4) After done once, many report doing in less than 30 minutes in subsequent years so lots of info for minimal time input.**

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