



**Dairy Profits I  
Show Me The  
Money!**

by Dr. Larry Tranel,  
Dairy Field Specialist,  
Iowa State University

Extension and Outreach

*“Profitability is a common goal with often uncommon understanding”*

As with most things in farming, there is often a wide range of profits and an even wider range of how a producer understand profits. Many confuse cash flow with profits, others compare partial analysis with full costs of production.

The goal of determining, understanding and comparing profits needs to start with a system that provides the necessary financial information, in both proper time and category. It begins with the net worth statements, both beginning and ending, followed by an accurate net farm income statement.

Often, it comes as a surprise that the cash flow statement is not even needed to do a profit analysis. Each of these statements will be further defined later.

The dollars and sense of dairy finances follow four thought lines. The first is profitability with the goal of supporting family living and accumulating wealth over time. The second is solvency with the goal of staying in business over time and avoiding losses in wealth. The third is liquidity, often correlated to cash flow, with the goal of being able to pay bills in a timely manner or

staying in business in the short term. The fourth is psychological income, or quality of life with the goal that foregoing added profits for the sake of personal gain other than financial.

So, the economy of profits often has goals that include quality of life concerns that can explain reasons for practices that may be less than ideal relative to recommended management practices. In order to determine the economy of profits, we need to make **statements** of various profit related items, mainly the Net Worth Statement and Net Farm Income from Operations Statement.

**Net Worth Statement or Balance Sheet**

*“Profit analysis has a beginning and end—both a picture in time”*



A full profit picture cannot be done without accurate and timely beginning and ending net worth statements. Assuming a calendar year accounting period, the net worth statement is a snapshot at one moment in time, January 1<sup>st</sup> each year. That picture can change if done 10 to 30 days late as cows are sold or die, feed inventories dwindle, equipment depreciates, accounts payable of liabilities decrease, etc. In other words, it is important the net worth statement is done the day of the beginning of the tax year and again the day of the end of the tax year so they coincide.



These two pictures, both beginning and end, show:

- the acres of land owned
- the quantity and value of dairy cows, heifers and other livestock

Farm ASSETS (what you own)		Farm LIABILITIES (debt you owe)	
<b>Current</b>		<b>Current</b>	
Cash, Savings	\$7,500	Taxes Due	\$2,350
Feed on hand	\$35,000	Accts Payable	\$22,000
Acct. Receivables	<u>\$6,000</u>	Principal Due	<u>\$12,500</u>
<b>Total Current</b>	<b>\$48,500</b>		<b>\$36,850</b>
<b>Non-Current</b>		<b>Non-Current</b>	
Cows /Heifers	\$167,000	Dairy Bank	\$142,000
Machinery/Eq.	\$103,000	Creamy Creditor	\$119,000
Buildings/Land	<u>\$330,000</u>	Land Contract	<u>\$69,000</u>
<b>Total Non-Current</b>	<b><u>\$600,000</u></b>		<b><u>\$330,000</u></b>
<b>Total Assets</b>	<b>\$648,500</b>	<b>Total Liabilities</b>	<b>\$366,850</b>
<b>Assets – Liabilities = Net Worth</b>			
<b>\$648,500 - \$366,850 = \$281,650</b>			

- machinery value, minus depreciation and sales, plus purchases
- other farm assets or stock (i.e. semen, coop stock, etc.)
- feed inventories and values
- account payables and prepaid expenses
- debt levels and additional monies borrowed during year

The goal is to be able to adjust the net cash farm income for inventory by taking ending minus beginning values to determine dollar value inventory change and the net worth value or owner's equity.

### Net Farm Income from Operations (NFIFO) Statement

*"Financial records are necessary first step to turn data in knowledge and thus good financial decision-making"*

The net worth statement needs a camera to take a still shot beginning and ending. The net farm income statement needs a



video camera that runs throughout the year and records

each financial transaction that takes place throughout the year and possibly the quantity of the purchase or sale if necessary for further analysis. This recording allows cash incomes and expenses necessary for filling out the Schedule F tax form and helps reach the Net Cash Income of the farm operation. The Schedule F and Net Cash Income calculation are both very preliminary calculation in any profit analysis. It could be likened in importance to the end of first quarter score of a basketball game. There is lots of game situations left that can greatly change the outcome. After the cash incomes and expenses are recorded, the NFIFO statement then needs to be adjusted for inventory changes as calculated from the ending minus beginning net worth statements. Calculating the NFIFO is extremely important in profit analysis, but is limiting in significance for determining profits. The NFIFO could be

likened to the half time score of a basketball game. There is a lot that could change farm profits from NFIFO standpoint, even though all incomes and expenses are accounted for at this point, except the opportunity cost of both owner's equity (the portion of assets owned by the owner operator, not indebted to the bank) and the opportunity cost of operator's labor. An opportunity cost on the equity would be what the value of the asset could earn if invested elsewhere (stock or bond market, bank CD, etc.). The opportunity cost of labor would be

what those same labor hours could earn in off-farm employment. Both of this opportunity costs are important for any full cost analysis. Anything short of including opportunity costs of owner's equity and operator labor shall be considered only a partial profit analysis, excluding any potential for comparison of this farm to any other.

### Net Farm Income from Operations

= Cash Farm Income  
 - Cash Farm Expenses  
 = **Net Cash Farm Income**  
 + Prepaid Expense Adjustment  
 - Accounts Payable Adjustment  
 + Feed Inventory Adjustment  
 + Livestock Inventory Adjustment  
 - Depreciation  
 = **NFIFO Goal: Opportunity Cost of Labor and Capital**

Consider this example why NFIFO should not be used as a profit measure:

	Farm #1	Farm #2
<b>NFIFO/cow</b>	<b>\$700</b>	<b>\$900</b>
- Equity charge/cow	\$200	\$400
- Unpaid labor/cow	\$100	\$500
<b>Net Profit/cow</b>	<b>\$400</b>	<b>\$100</b>

If using NFIFO as the profit comparison measure, NFIFO would show farm #1 to be the least profitable at \$700/cow versus Farm #2 at \$900/cow. In reality, Farm #1 is a higher debt farm with a higher percent of hired labor. Both the interest paid on debt and the hired labor bill are cash expenses so already accounted for in the NFIFO. In comparison, Farm #2 is very low debt with little hired labor, so most of the expense on owner's assets and owner's labor has yet to be accounted for in the NFIFO. After subtracting these opportunity charges for owner's equity and unpaid labor, we see a very different story. Farm #1 with the \$200/cow advantage in NFIFO has a \$300/cow disadvantage when all costs are considered—a \$500 swing in total. Thus, unless comparing farms with the exact same debt percentages and exact same hired labor percentages, the NFIFO can be a very misleading method to compare farm profits. Even comparing the same farm from one year to the next, due to debt being paid off or possible changes in hired labor, still might change the NFIFO for profit comparison.

From the NFIFO number, the analysis could subtract either the opportunity cost for equity or operator labor first. Most common would be to subtract the opportunity cost of equity first, thus the remainder would equate to the Net Return to Unpaid Labor. If comparing this same farm or a like farm in both labor costs and debt structure, this number could have some value. But, more often it is like comparing the third quarter score of the basketball game as this number does not yet know if it is one person earning the net return to labor or if 4 full time owners have not yet been paid. Thus, it is

deemed important that then net return to unpaid labor be divided by the number of full-time unpaid labor units for an annual per person return.

Better yet, is to divide the net return to labor by the annual hours worked to ascertain a return per unpaid labor hour. This net return per unpaid labor is a major goal of dairy financial analysis and one of three measures used by this author to compare profits from one farm to another. The two other measures are the net return per cwt. equivalent of milk produced and the rate of return on assets. Both will be discussed later in this chapter.

Bottom line of profit analysis is to truly get to the bottom line of profits. So often measures are used like net cash or schedule F income, FIFO or Net Return to Labor that do not give a full cost picture. These partial analysis measures can lead to dairy operators to make decisions that might mislead decision-making when comparing to other farms using partial analysis measures too.

### Further Analysis of the Net Return to Unpaid Labor

*"If one thinks their labor is not worth much, tend to not earn much for it"*

There is a labor market and a dairy producer who does not pay thyself is still part of the labor market. Not taking further steps to compare labor returns to what others are earning is probably shortchanging oneself as those who value their time make more of and for their time spent working.

When one analyzes the Net Return to Unpaid Labor, only one question really remains. How many labor units were utilized to attain this return

(annual FTE or full-time labor equivalents or FTE's or how many annual labor hours)? Consider the following example why this important.

2018 Iowa Organic Dairy Returns	HP Organic	HP Grass
<b>NFIFO per cow</b> (before interest)	<b>\$2,404</b>	<b>\$1,914</b>
- Equity Charge per cow @ 4%	- \$823	- \$713
<b>Return to Unpaid Labor per cow</b>	<b>\$1,581</b>	<b>\$1,200</b>
<b>Return to Unpaid Labor per hour</b>	<b>\$20.53</b>	<b>\$32.85</b>

In 2018 data on Iowa Organic Farms the higher profit organic (HP Organic) and higher profit grass milk (HP Grass) farms were compared for Return to Unpaid Labor per cow. The HP Organic farms averaged \$1,581 or \$381 more per cow. This would give first impression that they were more profitable. But, it is not known how many labor units this return represents or must be divided by to fairly compare these two systems.

If the Return to Unpaid Labor per cow is divided by the annual labor hours per cow the HP Grass farms on average were more profitable by \$12.32 per hour of labor worked (\$32.85 vs \$20.53). This is a highly significant difference when compared as having \$381 less Return to Unpaid Labor per cow. This per hour return allows dairy producers to compare their true labor returns to the labor market.

Making sense of profits can be tricky and again, often misleading, if not using a full cost picture and taking returns to their final step. Thus, dairy producers are highly encouraged to use Return to Unpaid Labor per Hour as one of three most important profit measures as mentioned previously.

This leads to the next step in financial analysis that begins by understanding the profit equation.

### Understand the Profit Equation

*"Returns are the rewards received for margins in management"*

Each dairy farm is unique and each dairy producer has a unique picture or thought process in their mind about how to discern profits

<p><b>Profit = (Price – Cost) x Volume</b></p> <p>to which one could compare to the following equation of ratios:</p> <p><b>ROA = OPM x ATO</b> 8.25% = 25% x 33%</p> <p>or Return on Assets (ROA) equals Operating Profit Margin (OPM) multiplied by the Asset Turnover Ratio (ATO).</p>
---

from their perspective. Thus, it behooves us to begin with a basic profit equation for us to consider returns received based on both margins and volume of production. The profit equation goes like this:

So, a common goal is to improve profits. How does one do that? Well, the first thought for most is needing a higher milk price. We could increase price by higher quality milk, higher component milk, selling better conditioned cull cows or calves, protecting future milk prices, etc. thereby improving the price portion of the profit equation. Or, graziers and organic dairy producers are known for working the cost side of the equation by lowering total feed costs per cwt. of milk produced through grazing (not just feed costs per cow), lower facility investment and/or lower labor costs, etc.

The changes in price received or costs incurred affect the OPM. A lofty profit goal is to attain an OPM of 25%. This means for every dollar received as income the dairy producer would keep 25 cents above costs for personal use. The OPM tends to be the advantage for lower input producers like graziers.

With the same (Price - Cost) difference, a second way to increase profits is to produce more volume. This tends to be the advantage of the more conventional dairy producer who might have only a 10% OPM but earns 10 cents on the dollar over 600 cows at 30,000 lbs of milk per cow annually. A typical profit goal is to attain an ATO of 33% meaning it would take three years to gross enough income to pay for all the assets on the farm (owned or borrowed). Consider a farm with \$1 million of assets. A gross income of \$333,333 would give an ATO of 33% and take three years; a gross income of \$500,000 would give an ATO of 50% and take only two years; a gross income of \$250,000 would give an ATO of 25% and take four years.

### Asset Turnover Ratio (ATO) for Farm with \$1 million invested

Gross Income:	\$333,333	\$500,000	\$250,000
Asset Turnover Ratio	33%	50%	25%
Years to Gross \$1 Million	3 years	2 years	4 Years

If only one measure is going to be used to determine profit status it would be ROA because it is the most all-inclusive measure that combines the net cash income adjusted for inventory, all labor costs and divides it into the total farm assets. The equation is depicted as:

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

### Why this Profit Equation Has Meaning to Dairy Producers

*"Focus on profits, not just avoiding costs"*

Dairy producers might not be aware that they are making decisions daily that affect this profit equation. And, quite often the reward of avoiding costs often has unintended consequences of reduced profits. Many dairy producers have a minimalist profit strategy—what is the least I can spend to get by? Others have a more optimalist profit strategy—how much do I need to spend as not to let profits on the table?

Often, conventional dairy producers, those who should have less propensity due to often lower OPM's, are more willing to be the optimalist while lower input producers with often higher OPM's are more willing to be the minimalist in their thinking and often let profits on the table as a result. Bottom line is that management style--profit focus and cost avoidance—plays heavily into the profit equation. A select few reasons are:

- There are efficiencies on various price incomes due to production practices.
- There are efficiencies on many costs due to input purchases.
- There are efficiencies on many costs due to quality, i.e. feed purchased or raised.
- There are efficiencies due to labor needs of various production practices, i.e. grazing, heifer raising, TMR, feed harvesting.
- There are efficiencies due to labor needs of various investments, i.e. milking system, housing facility and machinery purchases.
- There are efficiencies due to capital needs of various production practices and investment types.

This limited list hopefully highlights that daily production decisions, utilization of labor, long term capital use or investment decisions affect this profit equation. To improve the profit equation means we make good decisions daily, in addition to making good long term labor and investment decisions. Both short and long term decisions affect both the OPM and ATO, and thus ROA or profits! To sum up the importance of the profit equation, ruminant on the 5% ROA attained in a

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

$$\text{ROA} = \text{OPM} \times \text{ATO}$$

$$5\% = 20\% \times 25\% \quad \text{Grazing/Organic}$$

$$5\% = 10\% \times 50\% \quad \text{Conventional}$$

possible grazing/organic scenario versus a conventional farm scenario. The grazing/organic farm had a 20% OPM due to higher milk price and/or lower cost structure and a 25% ATO due to higher land ownership. The conventional farm only profited 10 cents on the dollar of income received but produced high volumes of milk per cow and relative to the assets owned (less land owned per cow). The multitude of variables that make up cost structures are worth discerning in order to better make decisions in the future.

### Calculating Cost of Milk Production per Cwt. Equivalent

Dairy producers are encouraged to figure their costs of production and use benchmarks. There are basic cost worksheets available that are being used in some organic profit circles. For those with computers, the Dairy TRANS 20.20 software program has been instrumental for many to figure their full costs of milk production. Each income item that is other than milk sales, can be divided by the milk price to garner a cwt. equivalent of that item. For example, \$10,000 of cull cow sales divided by a milk price of \$30 per cwt. would add 300.03 cwt. equivalents to the cwts. of milk sold. The same would be done for calf sales, crop sales or other farm related incomes.

Each expense or net item then can be divided by the cwt. equivalent number to give a vet expense or a feed expense per cwt. equivalent. Thus, the mailbox price becomes the income per cwt. and the milk cwts. is added to the other cwt. equivalents of whose sum becomes the number each

expense item or return item is divided by to give a cost, for instance of feed cost per cwt. equivalent of milk sold. This method is deemed most appropriate and beneficial so the cost structure is always correlated to the mailbox milk price. This total cost of milk production per cwt. equivalent is the third method to assess profitability. The lowest cost producers are not always the most profitable. The highest ROA farms are not always the most profitable. The highest Return to Unpaid Labor per Hour are not always the most profitable. This is why all three measures are used in combination to determine which farms are most profitable.

### Tranel's Top 3 Measures of Dairy Farm Profitability

- Return on Assets
- Return to Unpaid Labor per Hour
- Total Cost of Milk Production per Cwt. Equivalent

### Why Cash Flow Should Not to Be Confused with Profit?

As dairy producers make decisions, the terms profitability and cash flow are often used somewhat interchangeably and confusion between the two can cause producers to make decisions not in the best long term profit interests. Yes, at times, short term cash flow needs to outweigh long term profit interests as profit and cash flow do not always go hand in hand. Due to this, it is important for producers, lenders and other consultants who encourage decisions regarding farm profitability to know the difference.

Simply put, cash flow has the goal of having enough money available in a timely fashion to pay the bills on time. Profit is an orderly calculation of all farm incomes and expenses (cash and non-cash) to attain a Net Farm Income from Operations (NFIFO) that can be further allocated to unpaid resources, specifically the opportunity costs of unpaid labor and owner's equity. From this profit analysis, many profit calculations, can be obtained to better understand the business.

To begin ascertaining the difference between profit and cash flow, it might be easiest to look at what cash flow is not. Cash flow does not show profit, does not always correlate to profit and contains many numbers that have little or nothing to do with profit. The following table is an example of the items included in an annual cash flow,

### Cash Flow Statement

Beginning Cash Balance	\$4,325
Non-Farm Income	\$48,934
Income Taxes Paid	\$2,856
Principal Payments	\$24,576
Family Living Expenses	\$45,000
Capital Purchases	\$12,432
Capital Sales (exclude cull cows)	\$3,215
New Monies (loans, savings, etc.)	\$5,000
Net Farm Cash Income	\$37,558
<b>Ending Cash Flow</b>	<b>\$14,168</b>

basically all sources and uses of cash, both farm and non-farm. It begins with the beginning cash balance, non-farm income, and income taxes paid, all of which might not have much even to do with the farm. The next item is principal payments, an often

misunderstood item that is not part of part of a profit analysis, as the only place the principal payments will show on a financial statement is on the cash flow statement. The principal payment is not an

expense, but rather an investment producers make into the asset the loan is borrowed against. The interest paid with the principal is an expense listed on the net farm income statement, but principal payments are not to be considered an expense.

The Family Living Expenses follow, even though often equated with an owner's labor draw, it really has no connection to profitability except after the fact as higher profits may allow more luxurious family living expenses. Capital purchases and sales, related to both farm and non-farm assets can be a significant part of cash flow in various years. The note of excluding cull cow sales is due to cull cow sales being included in the farm cash incomes in this program.

New monies could increase cash flow and could come from loans and savings, a rich family member, etc., but, like most other cash flow items, possibly not highly related to farm profitability. The last item, Net Farm Cash Income, is often a most significant portion of the cash flow and can be heavily related to farm profits. These items in total help calculate Ending Cash Flow, a number necessary to be positive to make sure expenses and all financial commitments can be paid in a timely fashion.

Bankers and others are well trained in cash flow for necessary reasons—to make sure principal and interest gets paid back, whether from farm or personal sources. But, the “cash flow mindset” can lose focus on profit, the more important goal over time. Bottom line is that cash flow is a useful and necessary tool to manage finances, especially

when finances are tight, but cash flow is not a profit analysis tool. At the same time, profits cannot be attained if cash flow is not there, so it is a necessary tool.

During tight financial times, cash flow is said to be king and might be the most important thing necessary to keep a farm operating in both the short term (liquidity) and long term (solvency). For example, during tight times, a dairy operation might need to sell a profitable asset (cows, equipment, etc.) simply in order to have more cash flow. Or, a less profitable farm might cash flow easier due to lower debt load or a spouse's off-farm income than a really profitable farm that has a lower production cost, a higher return per unpaid labor hour and a higher return on assets.

Thus, cash flow is an important tool, but it needs to be kept in perspective as a tool to maintain liquidity and solvency rather than be used as the main reason why this investment decision was made or this management technique was implemented. Decisions and techniques that are made due to their profit potential tend to help the farm cash flow better in the long run. The caution is simply to know the difference between profit and cash flow and minimize decisions made, though at times necessary, to help cash flow that might actually decrease profits both in the short run and in the long run. In the end, know the difference between profit and cash flow and why Cash Flow Should Not be confused with Profit! Again, the Cash Flow Statement is not even a needed statement to do a full-fledged profit analysis.

### **Show Me the Money in SUM!**

In order to show anyone the money in a dairy operation it is necessary to make a few statements—the beginning and ending net worth statement and the net farm income from operations statement. Once these coordinated statements are done, the whole world of profit analysis opens up.

Schedule F Income, Net Cash Income, and even Net Farm Income from Operations (adjusted for inventory) are necessary calculations but poor, often misleading methods to compare profit performance with other years, producers or systems. Full profit analysis considers opportunity costs of both unpaid labor and owned equity as what both unpaid labor and owner's equity could earn in an alternative use.

Even beyond that, the unpaid labor should be divided by annual or hourly units utilized to better compare to labor markets. The Return to Unpaid Labor per Hour, coupled with the ROA and cost of milk production per cwt. equivalent, become three legs on the profit stool that have strength to compare to other dairy farms or dairy farm systems. The caution is to not confuse cash flow with profitability.

### **Profit Circles and Dairy Profit Networks**

In many like businesses, groups form to help its members better learn from each other. Dairy Profit Circles or Dairy Profit Networks have formed in various locations around the country. The thought, “one learns about self through others” definitely rings true here. The simplest way to get buy-in seems to be to go the route where liabilities and interest expense not be included as many do not like to share their “financial position” but more than willing to share income

and expenses. In lieu of the interest expense, a common charge like 4%, would be charged across all assets, whether owned or borrowed. The author feels this not only gets more “buy-in” but is also a more fair comparison across farms as the interest expense differences can skew net cash income numbers.

## **Dairy TRANS Analysis**

The next page illustrates a Dairy TRANS Financial Analysis. Information is mostly gathered from the Net Worth Statement and Schedule F Tax Form. The first page provides a net worth and cash flow summary on the top portion. The bulk of the rest of the page is the Net Farm Income from Operations Summary, complete with benchmarks, inventory adjustments, and Returns to Unpaid Labor and Returns to Unpaid Labor per hour worked.

The second page begins the Cost of Production and Break-Even Analysis, followed by the Dairy TRANS Profit Performance Rating taking the actual numbers and comparing between a benchmark and a goal. There are seven sets of benchmarks dealing with confinement, grazing, organic and grass milk systems. There are many numbers, benchmarks and analysis, meaning there are many ways to consider profitability.

The current version, Dairy TRANS 20.20 enables producers or consultants to enter a beginning and ending net worth statement (balance sheet) for both the beginning and end of the year being analyzed. If only interested in a profit analysis, the liabilities need not even be a part of the equation as an equity charge

can be used across all the assets, whether owned and/or borrowed. Dairy TRANS then uses a Schedule F template for incomes and expenses with a few exceptions. Line 2, requesting “Sales of livestock, produce, grains and other products raised” needs to be broken down by milk sales, calf sales, crop sales, etc. so each of those items can be benchmarked separately.

Several annual production items will also be asked for, namely, cwts. of milk sold, number of cows, milking and dry, number of cows culled or died, productive acres operated both pasture and crop, the opportunity cost of both owner’s equity and labor, and the number of hours of paid and unpaid labor. These items are necessary to attain efficiencies per labor unit, per acre and per cow for benchmarks.

With the above information, Dairy TRANS does a very complete financial analysis complete with benchmarking income and expense items on a per cow and per cwt. equivalent basis. It can also benchmark using Energy Corrected Milk (ECM). Net cash income is accrualized using inventory adjustments to attain the Net Farm Income from Operations (NFIFO), then subtracting on Owner’s Equity Charge to attain the Return to Unpaid Labor.

The Return to Unpaid Labor is divided by the unpaid labor hours to give a return per hour that can be compared to the labor market. The opportunity cost of both labor and owner’s equity is used to ascertain the full cost of milk production with all expenses, including labor and assets accounted for fully.

On the first page of the Dairy TRANS Analysis, the top left shows a Net Worth Summary, followed by a Cash Flow Statement in the middle. The top right shows the TOP Line Profits, a quick way to discern the profits and strengths/weaknesses of the dairy farm business with 10 calculations.

The first, the Return on Assets (ROA) at 5.75% is in yellow, meaning it is neutral, not a strength or weakness. The second, the Operating Profit Margin (OPM) at 10.42% in red, is a weakness. The third, the Asset Turnover Ratio (ATO) at 55.12% in green, is a strength. Interestingly, multiplying the OPM by the ATO equals the ROA, which can be compared confidently to the financial markets. Thus, these first three TOP Line Profit measures work together.

The next two TOP Line Profit measures (#4 and #5) deal with labor earnings. On the above farm, the operator earned \$20.32 per hour worked while all the labor, owner included, earned \$18.60 per hour worked. Many farms are surprised now and then, that the owner might make less, in low milk price times, than the employees, though not the case in this example. These labor returns can be compared confidently to the labor markets.

Then next TOP Line Profit measure (#6) gives the Net Income at \$0.91 per cwt. equivalent of milk sold and is in green. This is a full cost of production measure and includes all unpaid owner labor and a return to owner’s equity (that portion of assets owned and not borrowed). This number, combined with the Unpaid Labor Earnings per Hour and the ROA, are the three numbers most utilized when comparing the relative profitability of farms.

When comparing the relative production and financial efficiency of farms, TOP Line Profit measures six through ten are used, basically looking at how efficient Labor, Cows, Acres and Capital are being used in the operation on a scale of 1-10. The Labor Rank (#7) is a perfect ten and in green so the number of cows and the cwt. of milk sold per Full Time Equivalent (FTE) Laborer is probably great. The Cow Rank (#8) is a perfect ten and in green as well giving assurance that the milk production per cow is good relative to the system as are the labor costs, capital investment and debt, all on a per cow basis.

The Acre Rank (#9) is only at 4 and in yellow, so neutral, not really a strength or weakness, but more average. So, machinery investment, repair costs, crop input costs, and other measures on a per crop acre basis are mediocre on average. The Capital Rank (#10) is at nine and green so assets invested and other measures on a per cow basis are very good.

Thus, the TOP Line Profits show this dairy to be quite strong. Below the Cash Flow Statement is the Net Farm Income Statement with the major categories of both incomes and expenses from the Schedule F depicted, others combined. Each income item is listed in dollar value, per cwt. equivalent, per cwt. equivalent of Energy Corrected Milk (ECM), per cow with a benchmark per cow. Each expense item is listed as dollar value; per cwt. equivalent, then a benchmark per cwt. equivalent; per cow, then a benchmark per cow. The example benchmarks are for a grazing herd. The program can also use

benchmarks from organic, conventional, and Grass Milk dairies simply by selecting a different system.

The Net Cash Income is adjusted for inventory changes on both the income and expense side and also adjusted for capital purchases and sales to calculate the Net Farm Income of \$112,544. This number includes all costs except the opportunity costs of both unpaid labor and owner's equity charge. Taking out an owner's equity charge at 4%, gives a Return to Labor of \$74,151, a number not known to be good or bad until we know how many labor hours of FTE's went into earning that amount. If by chance it was one person earning that, it's pretty good but if it's three FTE's earning that, it is a poor return. That is why it is important to divide it by unpaid labor hours or FTE's to compare it to the labor market.

Page two of the analysis below shows the return breakdown in eight different ways. From left to right, first in dollar value, then per cwt. equivalent. In the middle, are two return analysis based on ECM, the top with full costs, the bottom a partial cost analysis excluding unpaid labor and owner equity charges. To the far right is a full return analysis, then partial return analysis excluding the equity charge; then excluding the unpaid labor and equity charges; then only excluding the unpaid labor charge.

The Dairy TRANS Profit Performance Rating then begins with many efficiency ratings per FTE Laborer, per Cow and per Acre with cell gradient rankings between the goal and average for each. These ratings, along with the income and expense levels per cow and per cwt. equivalent are great items for benchmarking dairy herds. Lastly, the "Sweet 16 PLUS financial ratios depict the financial health of the business but calculating profit ratios; financial efficiency ratios; liquidity ratios; solvency ratios; and repayment capacity ratios.

Lastly, the Dairy TRANS Profit Performance Rating in the bottom right corner is a summation of the last column to the right, using a calculated measure of the profit performance rating results from each item. The example farm is a pretty healthy business, could be better and could be worse, but still possessing room for improvement.

Many dairy producers ask for lots of advice regarding their dairy. It is so much easier and beneficial to first do a Dairy TRANS analysis as these results show much more about what is happening on the particular dairy than the owner sometimes even realizes.

Bottom line is that the Dairy TRANS 20.20 financial analysis is very valuable for managing financial improvements in improving the bottom line! The last two pages of this publication illustrate a Dairy TRANS analysis.

---

For more information on dairy profitability and the Dairy TRANS program, please contact Larry Tranel at [tranel@iastate.edu](mailto:tranel@iastate.edu)

---

This institution is an equal opportunity provider. For the full non-discrimination statement or accommodation inquiries, go to [www.extension.iastate.edu/diversity/ext](http://www.extension.iastate.edu/diversity/ext).

DAIRY TRANS 20.20			TRANS-Forming Dairy Data 4 Profits			Holstein	ColorBreeds	X Breds
Joe and Jane Dairy Family			123 Cheese Ln, Creamery, IA 12345			50%	25%	25%
Market	Analysis	2020	Herd Size =	175	Acres/Cow =	0.77	Productive Acres = 135	
<b>NET WORTH SUMMARY</b>			<b>CASH FLOW STATEMENT</b>			<b>TOP Line Profits</b>		
<b>ASSETS</b>			Beginning Cash Balance			1. ROAssets 5.75%		
<b>COST</b>	<b>Begin</b>	<b>End</b>	Non-farm Income			2. OPMargin 10.42%		
Current	\$103,185	\$103,157	Income Taxes Paid 1.1314757			3. ATO Ratio 55.12%		
NonCurrent	\$601,800	\$601,800	Principal Payments			4. \$Unpaid/Hr \$20.32		
<b>Total</b>	<b>\$704,985</b>	<b>\$704,957</b>	Family Living Expenses			5. \$ All/Hr \$18.60		
<b>MARKET</b>	<b>Begin</b>	<b>End</b>	Capital Purchases			6. Net/Cwt.Eq. \$0.91		
Current	\$103,185	\$103,157	Capital Sales (- cull cows sales)			7. Labor Rank 10		
NonCurrent	\$1,162,375	\$1,156,529	New Monies (loans, savings, ect.)			8. Cow Rank 10		
<b>Total</b>	<b>\$1,265,560</b>	<b>\$1,259,686</b>	Net Farm Cash Income			9. Acre Rank 4		
<b>LIABILITIES</b>			Ending Cash Flow			10. Capital Rank 9		
	<b>Begin</b>	<b>End</b>	11.92%			Goal > 10% Benchmark		
Current	\$5,608	\$5,608	<b>NET FARM INCOME STATEMENT</b>					
NonCurrent	\$300,001	\$294,393	Grazing					
<b>Total</b>	<b>\$305,609</b>	<b>\$300,001</b>	Farm Cash Income					
<b>OWNER'S EQUITY</b>			Yours /Cwt. Eq. /Cwt. ECM Yours/Cow /Cow					
<b>Change</b>	<b>Begin</b>	<b>End</b>	Milk Sales					
\$5,580	\$399,376	\$404,956	\$615,125 33,250 35,381 \$3,515 \$3,330					
(\$5,846)	\$560,575	\$554,729	Cull Cow Sales					
(\$266)	\$959,951	\$959,685	\$33,800 1,827 1,944 \$193 \$165					
<b>INVENTORY CHANGES</b>			113% Benchmark Benchmark					
Accounts Receivable			Farm Cash Expense					
\$0			Yours /Cwt. Eq. /Cwt. Eq. Yours/Cow /Cow					
Feed Inventory			78% Vet and Medicine					
\$72			\$15,792 \$0.42 \$0.44 \$90 \$70					
Supplies and Other			Dairy/Farm Supplies					
(\$100)			\$31,927 \$0.85 \$0.82 \$182 \$130					
Resale Livestock			Breeding Fees					
\$0			\$5,493 \$0.15 \$0.28 \$31 \$45					
Breeding Livestock			Dairy Feed Purchased					
\$0			\$263,200 \$7.00 \$11.91 \$1,504 \$1,894					
<b>Income Change</b>			Other Feed Purchased					
(\$28)			\$0 \$0.00 \$0.00 \$0.00 \$0					
Prepaid Expenses			Repairs					
\$0			\$11,262 \$0.30 \$0.75 \$64 \$120					
Accounts Payable			Seed, Chem, Fert					
\$0			\$28,959 \$0.77 \$0.61 \$165 \$96					
Machinery & Equipment			Fuel, Gas, and Oil					
(\$8,646)			\$17,944 \$0.48 \$0.45 \$103 \$71					
Land and Buildings			Utilities					
\$2,800			\$11,123 \$0.30 \$0.38 \$64 \$60					
Other Adjustments			Interest Paid					
\$0			\$0 \$0.00 \$0.47 \$0 \$75					
<b>Expense Change</b>			Labor Hired					
\$5,846			\$37,467 \$1.00 \$1.60 \$214 \$255					
Capital Purchases Minus			Rent, Lease & Hire					
Sales Adjustment			\$94,593 \$2.51 \$1.54 \$541 \$244					
\$8,040			Property Taxes					
Depreciation COST			\$3,224 \$0.09 \$0.16 \$18 \$25					
\$30,636			Farm Insurance					
Depreciation FM Value			\$14,794 \$0.39 \$0.31 \$85 \$50					
\$13,886			Other Cash Expense					
Unpaid Labor Cost			\$33,791 \$0.90 \$0.79 \$193 \$125					
\$40,000			<b>Total Cash Expense</b>					
Unpaid Labor Hours			<b>\$569,569 \$15.14 \$16.13 \$3,255 \$3,261</b>					
3,650			<b>Net Cash Income</b>					
Unpaid Labor FTE's			<b>\$126,458 \$3.36 \$1.26 \$723 \$404</b>					
1.22			Inventory Change					
Total FTE's (=3000 hrs/yr)			<b>(\$13,914) (\$0.37) \$0.00 (\$80) \$0</b>					
2.00			<b>Net Farm Income</b>					
<b>All Labor Earnings/Hour</b>			<b>\$112,544 \$2.99 \$2.00 \$643 \$404</b>					
<b>\$18.60</b>			Equity@ 4.0%					
Unpaid Labor Earnings/Hr			<b>\$38,393 \$1.02 \$1.41 \$219 \$285</b>					
<b>\$20.32</b>			<b>= Return to Labor</b>					
			<b>\$74,151 \$1.97 \$0.59 \$424 \$119</b>					

DAIRY TRANS Return /Cwt.Eq.			Energy Correct Milk (ECM)			Cwt. Eq. Break-Even Analysis						
Cash Income	\$696,027	37623	ECM/Cwt.Eq.		<Difference>	Per Cwt. Eq. Sold		minus equity charge				
+ Inventory	(\$28)	-2	Income	\$17.39	\$1.11	Income	\$18.50	Income	\$18.50			
<b>Total Income</b>	<b>\$695,999</b>	<b>\$18.50</b>	Expense	\$16.53	\$1.06	Expense	\$17.59	Expense	\$16.57			
Cash Costs	\$569,569	\$15.14	<b>ECM Net</b>	<b>\$0.85</b>	<b>\$0.05</b>	<b>Net</b>	<b>\$0.91</b>	<b>Net</b>	<b>\$1.93</b>			
+ Inventory	\$13,886	\$0.37	<b>-unpaid labor &amp; equity</b>		<Difference>	<b>-unpaid labor&amp;equity</b>		<b>minus unpaid labor</b>				
+ Overhead	\$78,393	\$2.08	Income	\$17.39	\$1.11	Income	\$18.50	Income	\$18.50			
<b>Total Costs</b>	<b>\$661,848</b>	<b>\$17.59</b>	Expense	\$14.57	\$0.93	Expense	\$15.51	Expense	\$16.53			
<b>Net Profit</b>	<b>\$34,151</b>	<b>\$0.91</b>	<b>ECM Net</b>	<b>\$2.81</b>	<b>\$0.18</b>	<b>Net</b>	<b>\$2.99</b>	<b>Net</b>	<b>\$1.97</b>			
DAIRY TRANS Profit Performance Rating					Years	Goal	%Between	Average	1-100			
Adjusted Gross Return per FTE Labor.....					\$348,000	\$314,685	195%	\$279,720	100			
Return to All Labor per FTE Labor.....					\$55,809	\$45,000	154%	\$25,000	100			
Number of Cows per FTE Labor.....					88	60	375%	50	100			
Cwts. of Milk Sold per FTE Labor.....					16,625	ECM/FTE= 17,691	10,000	365%	7,500	100		
All Labor Costs per Cow.....					\$443	\$600	179%	\$800	100			
Pounds of Milk Sold per Cow.....					19,000	ECM/FTE= 20,218	19,000	100%	16,000	100		
Milk Fat/Cow	760.00	lbs.	Total Debt per Cow.....		\$1,730	\$2,500	151%	\$4,000	100			
Protein/Cow	608.00	lbs.	Productive Acres per Cow.....		0.8	2	223%	3	100			
<b>Capital Cost per Cow.....</b>					<b>\$299</b>	<b>Capital Invested per Cow</b>	<b>\$6,625</b>	<b>\$500</b>	<b>158%</b>	<b>\$850</b>	<b>100</b>	
<b>Fixed Cost per Cow</b> (depreciation, interest, repair, taxes, insurance) .DIRTI 5					<b>\$466</b>	<b>\$700</b>	<b>147%</b>	<b>\$1,200</b>	<b>100</b>			
Net Farm Income per Crop Acre.....					\$834	\$600	149%	\$125	100			
Pounds of Milk Produced per Crop Acre.....					24,630	ECM/FTE= 26,208	8,000	654%	5,000	100		
Adjusted Gross Cash Income per Crop Acre.....					\$5,156	\$1,200	1089%	\$800	100			
<b>Machinery FMV</b> per Crop Acre.....					<b>\$1,336</b>	<b>\$600</b>	<b>-390%</b>	<b>\$750</b>	<b>0</b>			
Fuel, Gas and Oil Cost per Crop Acre.....					\$133	\$40	-272%	\$65	0			
<b>Repair Cost per Crop Acre.....</b>					<b>\$83</b>	<b>\$45</b>	<b>-156%</b>	<b>\$60</b>	<b>0</b>			
Fertilizer/Lime/Chemical/Seed Cost per Crop Acre.....					\$215	\$80	-797%	\$95	0			
Livestock over Total Investment Percent.....					31%	30%	108%	20%	100			
Cash Expense / Cash Income w/o Labor&Interest.....					76%	50%	-76%	65%	0			
All Labor as a Percent of Total Costs.....					12%	20%	183%	30%	100			
<b>Fixed Cost as a Percent of Total Cost.....</b>					<b>12%</b>	<b>35%</b>	<b>327%</b>	<b>45%</b>	<b>100</b>			
The "Sweet 16" PLUS of Financial Ratios												
1 Net Farm Income From Operations (NFIFO).....					\$112,544	\$50,000	308%	\$20,000	100			
2 Rate of Return on Assets..... Estimated					0.0%	Interest Paid	5.75%	10%	15%	5%	15	
3 Rate of Return on Equity..... [1-5 Profit Ratios].....					7.56%		15%	26%	5%	26		
4 Operating Profit Margin.....					10.42%		25%	-46%	15%	0		
5 Asset Turnover Ratio.....					1.8 years		55.12%	45%	167%	30%	100	
6 Operating Expense Ratio..... [4 Efficiency Ratios].....					82%		50%	-218%	60%	0		
7 Depreciation Expense Ratio.....					2%		10%	260%	15%	100		
8 Interest Expense Ratio.....					Total		0%	10%	300%	15%	100	
9 Net Farm Income Ratio.....					100%		16%	35%	-88%	25%	0	
10 Earnings B4 Interest, Income Taxes, Depreciation & Amortization.....					\$98,658	\$60,833	224%	\$30,417	100			
11 Current Ratio..... [3 Liquidity Ratios].....					18.40		1.75	3430%	1.25	100		
12 WorkCapital/Gross Rev					14.02%	13 Working Capital..	\$97,549	\$45,608	328%	\$22,804	100	
14 Debt/Asset Ratio...[Solvency]...Beginning...					24%	Ending	24%	40%	262%	50%	100	
15 Equity/Asset Ratio.....Beginning...					76%	Ending	76%	60%	262%	50%	100	
16 Debt/Equity Ratio.....Beginning...					32%	Ending	31%	67%	375%	80%	100	
17 Debt & Capital Lease Coverage Ratio... [2 Repay Capacity Ratios]...					15.41		2.3	11.086	1.0	100		
18 Ca/Debt Repay Capacity..					\$86,430	19 Replacement Margin	\$80,822	Dairy TRANS Profit Status				
<b>Profit (ROA)=</b>					<b>5.75%</b>	= (Price - Cost) or OPM	<b>10.42%</b>	xVolume(ATO)	<b>55.12%</b>	<b>is</b>	<b>GREAT!</b>	<b>85%</b>