Pennsylvania Dairy Performance Indicators: 2022 Baseline

Introduction

You cannot manage what you do not measure. That may sound cliché to many, but it is reality. In early 2022, the Center for Dairy Excellence approached several financial institutions within Pennsylvania that have dairy benchmarking programs to see if there was interest in developing a state benchmarking program. These discussions evolved into a joint project between Horizon Farm Credit, Penn State Extension, and the Center for Dairy Excellence that is called "Pennsylvania Dairy Performance Indicators." The Center facilitates the project while Horizon Farm Credit and Penn State Extension gather the data from their respective benchmarking programs, combine it into one larger, anonymous database, and then analyze the data to provide the key performance indicators. Pennsylvania dairy farm families and the industry representatives that support them can use these performance indicator averages to compare to their individual dairy performance against a "state" average. Furthermore, the dairy industry can use this data to track progress over time.

Since different institutions sometimes calculate the same metric differently, the first step was to decide what key performance indicators were calculated similarly where a combined database would not be skewed by different calculations for the same metric. A committee consisting of representatives from each of the three organizations developed a list of seventeen performance indicators, ranging from herd performance metrics to financial performance metrics. The goal of this project is to help dairy farm families and their industry representatives realize that they can measure this type of data and manage it to have a stronger Pennsylvania dairy industry. The remainder of this report will review seventeen of the key performance indicators organized by herd size as well as conventional dairies and organic dairies.

Herd Performance Metrics

Diving deeper in the general performance indicators can help us determine what areas the Pennsylvania Dairy Industry should focus on to improve their operations. It is important to note that there is a decent distribution across the herd sizes, with 220 herds making up this data. Herd size groups were established to represent the typical distribution of herd size in Pennsylvania: less than 100 cows, 100 to 299 cows, and 300 cows or more. The combined dataset also allowed for an initial review comparing two different production systems: conventional and organic. Table 1 summarized the averages for the whole dataset as well as the two group sets for herd performance metrics.

When we look at milk shipped per cow or energy-corrected milk shipped per cow, do not assume that those numbers tell you if a farm or herd size group is profitable. As a herd expands, it typically requires more milk production per cow to cover those expansion costs. These expansions typically have updated facilities to promote cow comfort and production. Profitability is tricky. Costs differ across farm sizes; larger farms require more labor and typically have more investments in their facilities, requiring more production to cover those costs.

Table 1: 2022 Herd Performance Indicators by Herd Size Group and Production Type

Herd Performance Indicators	2022 PA Average	Herd Size Group			Production Type	
		99 cows or fewer	100 to 299 cows	300 cows or more	Conventional	Organic
Number of Herds	220	72	89	59	196	22
Average Herd Size	306	66	175	795	332	68
Milk Shipped per Cow	23,256	21,065	23,702	25,258	24,217	15,445
Energy Corrected Milk Shipped per Cow[1]	24,828	22,355	25,456	26,897	25,834	16,433
Costs						
Total Feed Cost per Cow[2]	$ 2,681	$ 2,405	$ 2,736	$ 2,935	$ 2,702	$ 2,529
Total Feed Cost per Cwt.[2]	$ 11.67	$ 11.76	$ 11.57	$ 11.72	$ 11.18	$ 15.75
Net Cost of Production per Cwt.[3]	$ 22.94	$ 24.03	$ 22.47	$ 22.32	$ 22.17	$ 29.41
General Financial Indicators						
Net Margin per Cow[4]	$ 1,288	$ 1,298	$ 1,283	$ 1,282	$ 1,312	$ 1,136
Net Margin per Cwt.[4]	$ 5.67	$ 6.55	$ 5.41	$ 5.01	$ 5.36	$ 8.62
EBITDA per Cow[5]	$ 2,336	$ 2,409	$ 2,418	$ 2,122	$ 2,414	$ 1,757

Notes:

[1] Energy Corrected Milk: (12.82 x lbs. of Fat + 7.13 x lbs. of Protein + 0.323 x lbs. Milk Shipped)/365/Avg Herd Size.

[2] Total Feed Cost: Includes Purchased Feed & Crop Expenses (Seed, Fertilizer, Chemical). Accrual adjusted when possible.

[3] Net Cost of Production: Includes depreciation expense and not principal payments. There are two methodologies used to determine this metric, one looks at whole farm and the other focuses on dairy enterprise. Both methods provide comparable results.

[4] Net Margin: Gross Farm Revenue less Total Expenses, including depreciation.

[5] EBITDA per Cow: Accrual based Earning before tax, interest, and depreciation/amortization.

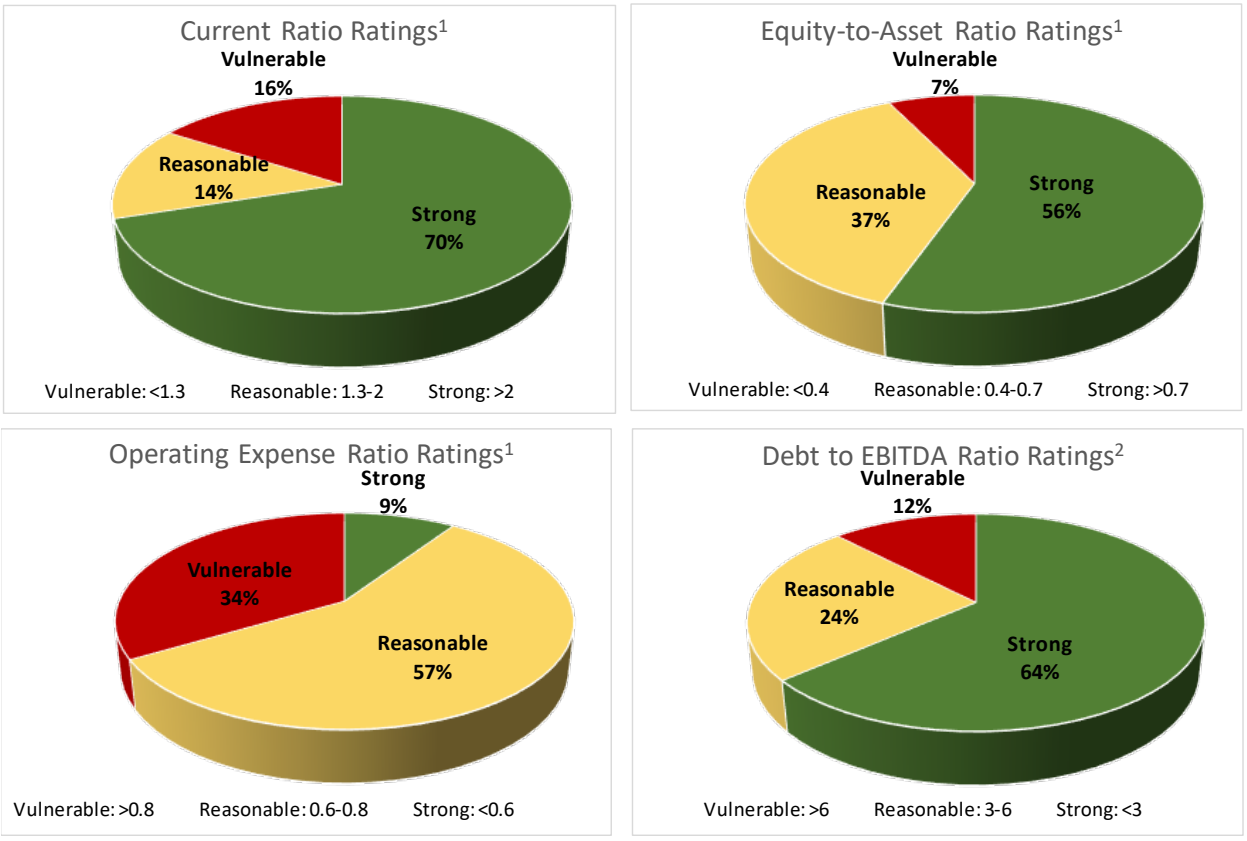
One of the largest costs of milk production is feed, purchased and home raised. Regardless of group, total feed cost averaged 50% of the net cost of production per cwt. Differences can be seen between herd size groups on a per cow basis, but given the greater average production in larger farms, little difference was seen on a per cwt basis. For production types, it is more challenging to compare those costs. Some organic farms have adopted the low input model, which can influence the average total feed cost of the group. Regardless, feed costs continue to be high, which should be closely monitored as the forecasted milk prices are expected to be lower in the upcoming year. As this data shows, if a producer is a strong business manager with a smaller herd, they can still achieve a higher Net Margin. Improving margin is essential.

Pennsylvania Financial Indicators

In addition to the nine performance and profitability indicators listed above, four financial indicators were selected: current ratio, equity-to-asset ratio, operating expense ratio, and debt to EBITDA ratio. These were chosen as barometers to liquidity, solvency, financial efficiency, and repayment capacity of the dairy operations. Figure 1 outlines where all operations, regardless of size or production type, compared to the recommended guidelines from the Farm Financial Standards Council. The one difference to those recommended guidelines is the range for debt to EBITDA ratio. That range was established from industry recommended $3,000 - $6,700 debt per cow (Penn State Extension, 2018) and an average $1,300 EBITDA per cow (Horizon Farm Credit, 2023). These ratings are not necessarily to be used as a scorecard to say farms did well or were not performing. The ratings offer insight into what metrics may be more critical to focus on, evaluate why a given metric is in a reasonable or vulnerable

range, and what management practices or operational changes would be pertinent to address any shortcomings.

Figure 1: 2022 Financial Indicator Ratings



Notes:

[1] Recommended Ratings based on the Farm Financial Standards Council Guidelines, www.ffsc.org.

[2] Recommended ratings based on debt per cow recommendations (Penn State, 2018) and average EBITDA per cow (Horizon Farm Credit, 2023).

2022 was a great year for most dairies. Profits were available to pay down debt, current and long-term, and/or pay ahead into 2023. This resulted in 70% of farms having strong current ratios above a ratio of 2, indicating for every $1 of current debt these farms held, they had at least $2 in current assets. There were some farms in which 2022 provided some financial relief, but current assets like feed inventory were restricted due to poor growing conditions last year, hindering the current ratio. In addition to strong liquidity, over half the farms in 2022 rated strongly on their equity to asset ratio. This measure of solvency depicts most farms have reasonable long-term business health. Another way to look at this metric for 2022 is that 9 in 10 farms can potentially incur a modest amount of additional debt to help spur their next business growth cycle.

Financial efficiency is important to all businesses, especially dairy. Some markets are limiting the production growth potential through base programs, so constant evaluation and monitoring of financial efficiency is a key tool producers can deploy to help maintain net margins. This is a challenge for dairy especially. As previously stated, 50% of the cost to produce milk relates to feed alone. Given that

expense pressure, it is very challenging to achieve the recommended 60% operating expense ratio. Two thirds of the farms spent at most $0.80 for every $1.00 of revenue generated. As an operation increases past 80%, it limits the ability of the business to generate income to reinvest in the business. The final barometer evaluated for repayment is the debt to EBITDA ratio, which looks at how much debt does an operation have per dollar of EBITDA generated. Most farms in 2022 had strong levels for this ratio less than $3 debt per dollar EBITDA. This metric will be one to watch as margins come down from eight-year highs to see where dairies perform on an average year.

Indicators still under consideration

Some of the identified indicators are being monitored this year to evaluate calculations and comparability, specifically assets per cow, debt per cow, return on assets, and total revenue to total labor cost ratio. These metrics have several acceptable methods of valuation and calculation, and the committee continues to review results to determine what changes may be warranted to improve the ability to share those metrics in the future.

Summary

2022 was a great year for most dairies to generate revenue, even with the increases in expenses. As a top milk producing state, a concerted effort to evaluate the financial performance will help to identify common struggles or growth opportunities to help Pennsylvania dairies compete in the national and global markets. Despite variations in production and cost structures, the key for any dairy to be successful is to evaluate their unique situation, identify where to gain efficiencies, and begin to benchmark against themselves. As this project moves forward, growing the number of dairies represented to get a more complete snapshot of Pennsylvania's dairy industry will be a catalyst to drive future success.

Sources

Horizon Farm Credit, 2018-2022 Dairy Success and Profitability Review, Horizon Farm Credit | Horizon Farm Credit (horizonfc.com); 2023.

Penn State Extension, Business and Production Guide for Dairy Cattle Operations, Business and Production Guide for Dairy Cattle Operations - SARE Grant Management System; 2018.