

USRSB Cow-Calf Financial Health Index Report

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August 6, 2024

Project Goal

CattleFax was requested by the U.S. Roundtable for Sustainable Beef to develop a cow-calf financial health index that tracks and benchmarks the financial health of the U.S. cow-calf sector. The index will utilize publicly available data and include key performance indicators (KPIs) addressing five major areas of financial analysis: liquidity, solvency, profitability, repayment capacity, and financial efficiency. This report outlines the index developed and provides commentary and analysis on the financial health of the U.S. cow-calf sector.

Overview & Background

The financial and economic health of the cow-calf sector is vital for the long-term sustainability of the cattle and beef industry. Unfortunately, due to the diversity of goals, business structures, and environment in which producers operate, quantifying the financial health of the industry is extremely difficult. Acknowledging these challenges, an index was necessary to attempt to capture broad trends in the financial health of the cow-calf sector. Furthermore, because of the diversity of the industry and extremely wide ranges in financial status, the index was developed to gauge improving or deteriorating trends, rather than the absolutes of poor or strong financial health.

The USRSB has set a target for the cow-calf sector to “develop a cow-calf financial health index and set sector targets for improvement by 2025”. To aid in this project, CattleFax was enlisted to develop and regularly update a financial health index for the U.S. cow-calf sector.

The data used to develop the index was sourced from the USDA Economic Research Service’s Agricultural Resource Management Survey (ARMS) data which includes information on financial metrics across a robust sample of U.S. cattle operations. The data used is specifically for operations focused on beef cattle production and includes all farm types (family farms, nonfamily farms, and corporate farming entities).

The index includes several financial KPI’s to create a wholistic picture of financial health in terms of liquidity, solvency, profitability, repayment capacity, and financial efficiency. As shown later, profitability and financial efficiency metrics are weighted more heavily. These factors are believed to better illustrate the economic environment in which cattle producers operate, while debt and equity structures (i.e. balance sheet measures) to some degree reflect management and operational decisions made by each operation.

Methodology

Data Source

A requirement of this project was to utilize publicly available data sources that capture the primary aspects of financial health. Data sourced should come from institutions that have a high degree of continuity, i.e., they are expected to continue publishing data for the foreseeable future. Following these parameters, the Agricultural Resource Management Survey (ARMS)

from USDA's Economic Research Service (ERS) was identified as the best source of information with which to build the index.

This survey serves to inform the U.S. Department of Agriculture on the “production practices, resource use, and economic well-being of America’s farms and ranches” (USDA ERS). Survey results are also released to the public for use in better understanding the financial situation and trends of America’s agricultural operations. Results are organized within a dissemination tool that allows for more detailed interaction and selection of data. Surveys for each commodity sector occur approximately every five years. The ERS data for non-survey years is based on the most recent survey with updated costs and prices based on other USDA data sets to reflect changing market conditions. The primary limitation to this data source is that the ARMS data is subject to delayed releases as data is collected, analyzed, and published. For example, the 2022 data was released in December 2023. The index was developed using data from 1996 to 2022, the full timeframe of ARMS data available.

KPI Selection

ARMS data can be accessed and tailored reports can be generated through the following link: [USDA ERS Reports](#). All index measures come from ‘Farm Business Financial Ratios’ within the ‘Report’ selection. Ratios are preferred over single metrics for use in financial analyses as they capture the relationship between multiple factors and, thus, are more ideal to track performance across time. ‘All Farms’ is selected within the ‘Subject’ classification. These include family, nonfamily, and corporate operations. Data is further sorted by ‘Production Specialty’ for operations where ‘Cattle’ is the primary commodity produced.

When evaluating financial health, multiple metrics or KPIs need to be considered concurrently to gain a more complete picture rather than a focus on one single measurement. These financial metrics typically cover the following areas: liquidity, solvency, profitability, repayment capacity, and financial efficiency.

- Liquidity reflects the ability to pay off current debt obligations without having to raise external capital. Liquidity focuses on short-term obligations and the ability to convert assets to cash to cover these.
- Solvency reflects the ability to meet long-term debt obligations. Solvency ratios compare cash flows against noncurrent liabilities, including both principal and interest, and are more reflective of long-term health.
- Profitability reflects the ability to earn revenue relative to operating costs and asset base. This metric is necessary for both long-term survival and potential growth or expansion. Profitability metrics can be categorized as return ratios or margin ratios. Margin ratios measure revenue based on sales while return ratios measure revenue against assets or investments in the operation.
- Repayment capacity reflects the ability to cover term debt or capital expenses. It can indicate the maximum debt capability, or ability to make payments on time with cash on-hand.
- Financial efficiency ratios reflect the ability to create revenue from assets. Thus, they are commonly used as a measure of efficiency of management. It is also a useful tool for comparison between industries.

The following is a list of KPI's were considered for each area, as well as their calculation:

1) Liquidity

- Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$
- Working Capital to Expense Ratio = $\frac{\text{Total Assets} - \text{Total Liabilities}}{\text{Operating Expenses}}$

2) Solvency

- Debt-to-Asset Ratio = $\frac{\text{Total Liabilities}}{\text{Total Assets}}$
- Debt-to-Equity Ratio = $\frac{\text{Total Liabilities}}{\text{Total Shareholders' Equity}}$

3) Profitability

- Operating Profit Margin = $\frac{\text{Net Farm Income} + \text{Interest Expenses} - \text{Labor \& Mgmt}}{\text{Gross Farm Income}}$
- Operating Expense Ratio = $\frac{\text{Operating Expenses}}{\text{Gross Farm Income}}$
- Economic Cost-to-Output Ratio = $\frac{\text{Cash Costs} + \text{Depreciation} + \text{Labor \& Mgmt}}{\text{Gross Farm Income}}$

4) Repayment capacity

- Term Debt Coverage Ratio = $\frac{\text{Net Farm Income} + \text{Depreciation} + \text{Interest on Term Debt}}{\text{Annual Scheduled Principal} + \text{Interest on Term Debt}}$
- Repayment Capacity Use (at either 7.5% or 10%)

5) Financial efficiency

- Return on Assets = $\frac{\text{Net Farm Income} + \text{Interest Expenses} - \text{Labor \& Mgmt}}{\text{Total Assets}}$
- Return on Equity = $\frac{\text{Net Farm Income} - \text{Labor \& Mgmt}}{\text{Total Equity}}$

Potential metrics were sorted and grouped by which financial document they were primarily derived from. Of the 11 measures listed above, six were selected for integration into the financial health index. Selected measures, and their weighting, are listed in Table 1.

Table 1. Categorization and weighting of individual KPIs

Balance sheet:	
<i>Liquidity, Solvency, and Repayment Capacity</i>	
Current Ratio	10%
Debt-to-Asset Ratio	10%
Term Debt Coverage Ratio	10%
Group Weight	30%
Income statement:	
<i>Profitability and Financial Efficiency</i>	
Operating Profit Margin	25%
Operating Expense Ratio	20%
Return on Assets	25%
Group Weight	70%
Total Weight	100%

Selection and weighting of KPIs within the index was guided by CattleFax internal discussions and from discussions and feedback from the USRSB cow-calf financial working group. Little to no existing academic research was found that specifically pertained to developing the type of financial health index as requested by the USRSB.

Profitability and financial efficiency measures are more income statement-oriented, meaning that they more accurately reflect shorter-term financial health. These metrics more accurately reflect the individual year's environment which is given greater importance in the cyclical beef cattle industry. These KPIs, which place greater emphasis on net income, are a strong measure of individual years' success or failure. Thus, income statement-based measures play a greater role in the year-to-year decision-making process among cow-calf operation managers. Over time, cumulative years of strong or poor profitability and financial efficiency tend to drive trends in balance sheet-oriented measures. For these reasons, profitability and financial efficiency were given a heavier overall weight.

Liquidity, solvency, and repayment capacity measures are more balance sheet-oriented metrics meaning that they serve as longer-term indicators of financial health. As measures that reflect longer-term manager decisions, these metrics were given a lighter overall weight that was evenly distributed between ratios. However, as balance sheet measures are clearly an important component of financial health, these KPIs were still deemed important to integrate into the index.

Calculation of the Index

In order to calculate the USRSB financial health index, each selected KPI is first individually indexed by subtracting each year's value from the average of the series, then dividing by its standard deviation. The debt-to-asset ratio and operating expense ratio were multiplied by -1. This indexing approach results in each individual KPI having the same numerical scale with higher values being better and lower values worse. Assuming a normal statistical distribution, each individual KPI will range from about -3.0 to 3.0 at the extremes. Statistically, about 68% of KPI values should fall between -1.0 and +1.0, representing the "normal" range.

A weighted average of the six variables is then calculated using the weights in Table 1. This weighted average is then converted to an index based on its own historical average and standard deviation using the same approach described above. Index values below zero reflect weak financial health while values above zero indicate strong financial health compared to the historical baseline.

The USRSB Cow-Calf Financial Health Index is calculated based on averages and standard deviations from 1996 to 2022. These 27 years of data create the baseline values against which new, future years of data will be compared. Multiple future years above the baseline would indicate a trend of improvement over time, while multiple years below the baseline would indicate a decline in financial health over time.

Data points for futures years will not be added to the historical baseline so that the baseline remains constant. This also means that KPIs and the overall index for a given year will not change or need recalculated as new data becomes available, unless USDA releases revisions to the underlying data.

Results

The indexed data points across time for the individual KPIs are shown in Figure 1. Individual KPIs tend to follow a similar overall trend over time yet still remain independent. KPIs should be expected to generally move together to indicate good years and bad years, but the deviations confirm the importance of using multiple KPIs within the index.

Additionally, KPIs which use some of the same data in their calculations (see list of KPIs) tend to show more similarity over time. For example, the Current Ratio and Debt-to-Asset Ratio have a tendency to track together as do Operating Profit Margin and Return on Assets.

Figure 1. Individual indexed KPIs across time

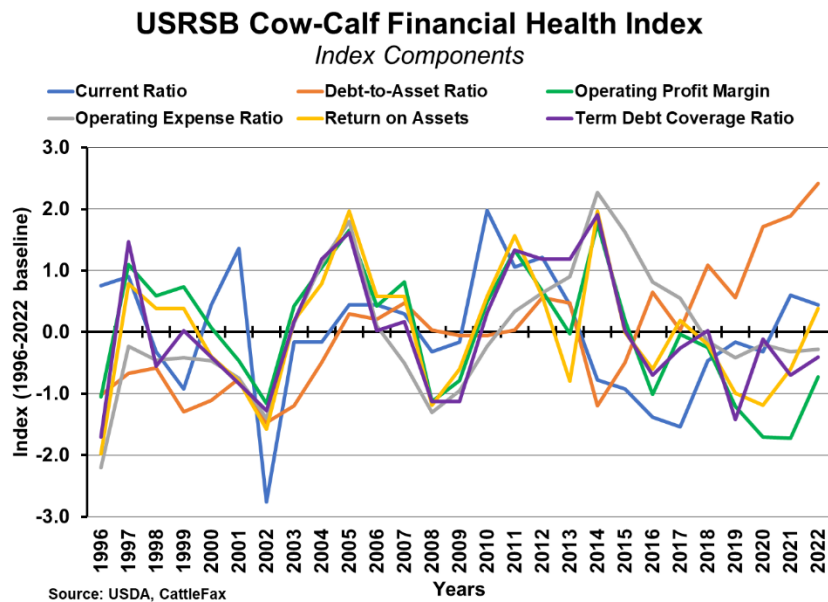


Figure 2 shows the Financial Health Index (black line) laid over the individual KPIs. The index is a weighted average of the six indicators which is then standardized again. The Financial Health Index has been trending higher since the recent low in 2019. It broke the long-term downtrend that followed the highs in 2014. The individual KPIs in Figure 1 and Figure 2 can be studied to help understand how different aspects of financial health are shifting and contributing to changes in the overall index.

Figure 2. Financial Health Index overlaid across individual KPIs

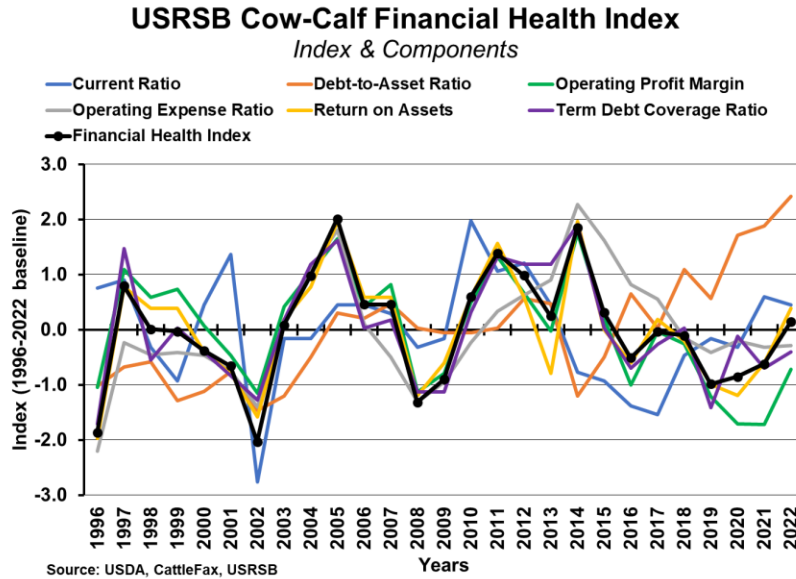
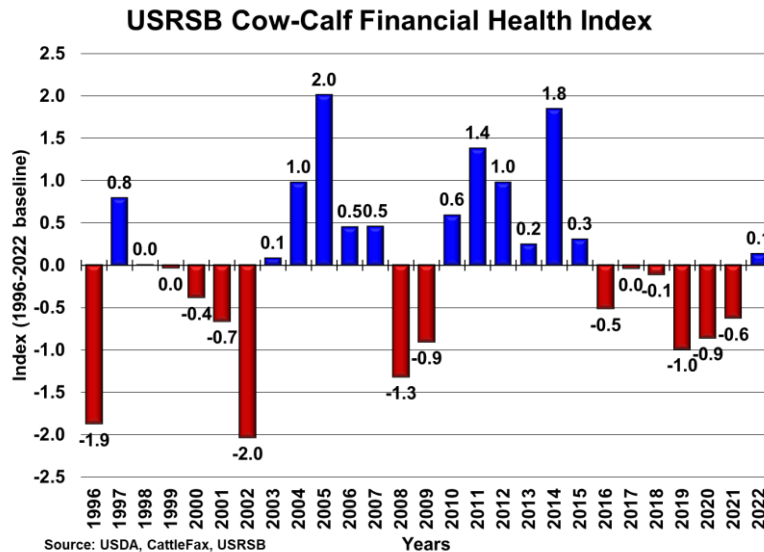


Figure 3 illustrates the overall Financial Health Index alone. A higher index indicates better financial health with zero representing the historical average. Statistically, -1.0 to +1.0 indicates the “normal” historical range, capturing about 68% of data points. The 2022 index of 0.1 is only slightly above the long-term average, indicating a very neutral status.

Figure 3. Financial Health Index across time with data labels



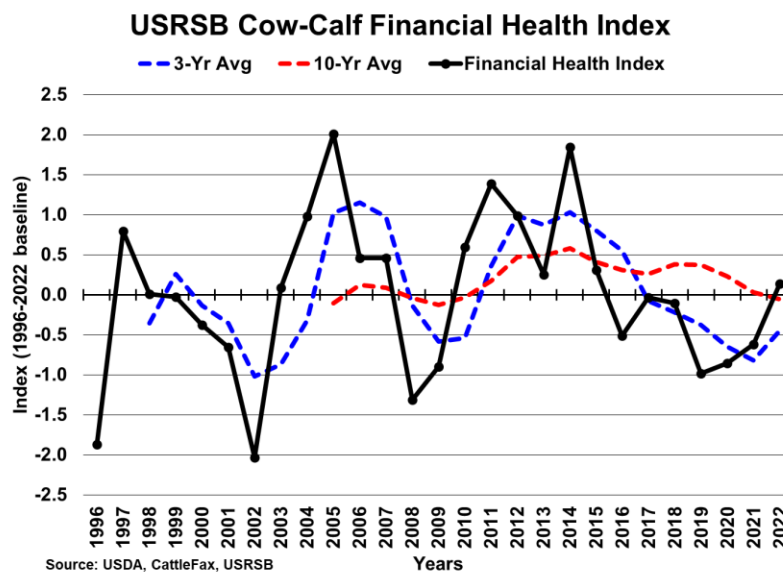
Since long-term financial health is largely driven by the cumulative effects of several years, 3-year and 10-year averages of the index were also evaluated. The 3-year average smooths the effects of one extreme year and reflects the cumulative effects of a few years on producer

financial wellbeing. The rationale is that three particularly good years or poor years consecutively will have a material impact on producer financial health. Additionally, a three-year span is also the timeframe often required for the results of breeding and management decisions to be translated back to the bottom line.

A 10-year average was included to measure long-term trends in financial health. This helps smooth across the cyclical swings in profitability that are expected with the cattle cycle. Since cattle cycles typically last 10 to 12 years, a 10-year average encompasses both the highs and lows of a cycle. Across a full cattle cycle, have the good years outweighed the poor years, or vice versa?

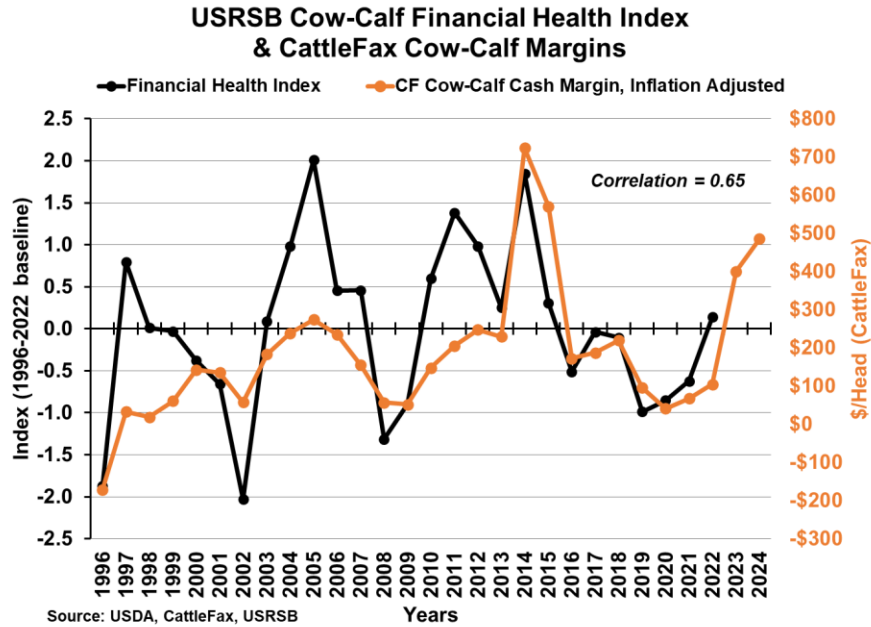
As shown in Figure 4, the 3-year average index began to turn higher in 2022 but was still in negative territory from the cumulative effect of poor index values in 2020 and 2021. The 10-year average has been trending lower since 2019 with the latest data from 2022 on par with the long-term average. On a 10-year basis, strong financial health index values from the highs in the last cycle have been neutralized by lower values in more recent years.

Figure 4. Financial Health Index with multi-year rolling averages



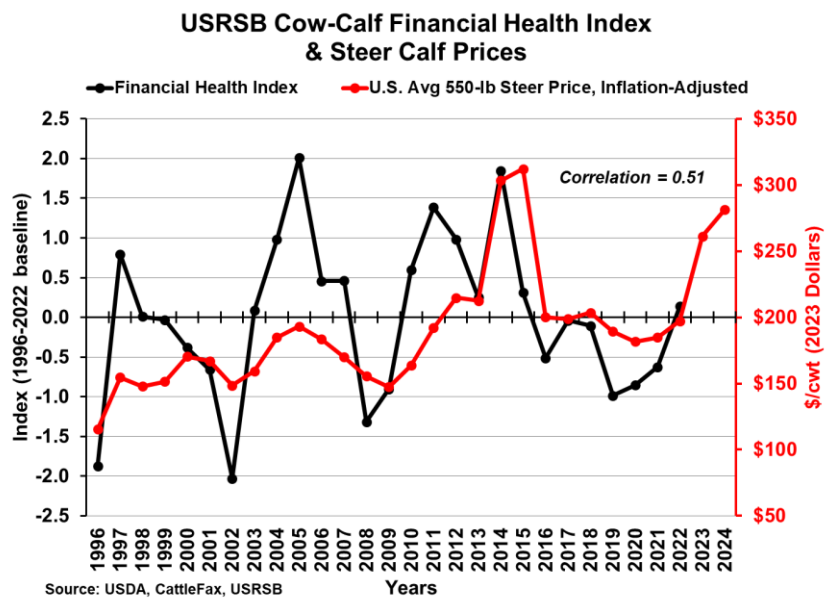
The Financial Health Index was compared to the CattleFax cow-calf cash margin estimate (on an inflation-adjusted basis) to validate against a separate, independent dataset, as shown in Figure 5. The 65% correlation and visual fit indicates that the USRSB index shows similar patterns in profitability and financial health over time. The fit is not perfect, largely because of the additional components included in the USRSB index compared to the CattleFax estimate, which is more short-term in nature. The moderately strong correlation also allows the CattleFax margin estimate to be used as an indicator of future trends in the USRSB index until new ERS data is released, currently indicating continued improvement in 2023 and 2024.

Figure 5. Validation against the CattleFax cow-calf margin estimate



In a secondary comparison, the Financial Health Index was validated against annual average calf prices in Figure 6. Inflation-adjusted U.S. average 550-lb steer prices demonstrated a 51% correlation to the index. Though a weaker fit than the CattleFax cow-calf margin, this chart confirms the logical relationship between calf prices and financial health, as measured by the index. The CattleFax cow-calf margin is likely a better fit due to the inclusion of costs, while calf prices only capture revenue.

Figure 6. Relationship between calf prices and the USRSB index



Analysis & Interpretation

The Financial Health Index turned slightly positive in 2022 after a tough span from 2016 to 2021. The 3-year average is still below baseline, though finally trending higher. This is clearly positive. One positive year for the index is good, but the industry needs a prolonged positive run after recent years of constrained producer profitability. The 10-year average has been trailing lower and reached baseline in 2022, raising a caution flag from a long-term standpoint. In other words, after smoothing for the cyclical nature of margins, cow-calf financial health has been on a negative trajectory.

Fortunately, the index is expected to show improvement in 2023 and 2024. Producer revenues surged in 2023 as cattle supplies tightened and leverage shifted back to the cow-calf segment. Meanwhile, production and operating costs finally flatlined after several years of sharp increases. The same story has been continued to play out in 2024. Calf prices are posting new record highs as beef prices remain strong and a higher percentage of the retail beef dollar is flowing back to the cow-calf segment. From a cost standpoint, feed prices have declined in many regions of the country. Improvements in the CattleFax cow-calf margin supports the expectation of improvement in the USRSB index in 2023 and 2024.

Within the index, profitability measures were especially pressured from 2019 to 2021. Profitability sub-indexes have been improving but were mostly negative as of 2022. Higher calf values in 2023, and forecasts for continued price strength, should be supportive to profitability moving forward. Indeed, improvements to the profitability-based KPIs are much needed to improve the overall trajectory of the index in the years ahead.

Liquidity and solvency sub-indexes are neutral to strong, suggesting improvement in balance sheets in recent years. This was a somewhat surprising finding as the strengthening was occurring during years when profitability measures were generally low.

Balance sheet measures can be improved by two means: reducing debt or growing assets. A combination of both has likely been at play. Producers may have been working to reduce debt burdens to manage through the period of narrow margins. Government assistance programs may have also contributed (e.g. CFAP, PPP, drought/disaster programs) if producers used these funds to help lighten debt loads.

There is also the trend of more operations paying off land purchases over time in cases where the land has been held by the same individual, family, or business for multiple decades. This translates to a stronger balance sheet position for the operation and has likely occurred broadly enough to show balance sheet improvement for the industry.

In addition to reducing land debt, rising values for those land assets has also benefitted producer balance sheets. Demand from land investors and lifestyle interests are likely major factors increasing land values for cattle producers. Other macro-influences may also be at play, such as quantitative easing programs by the U.S. Federal Reserve following the Financial Crisis and during Covid. Years of ultra-low interest rates and purchases of financial assets by the Fed may have directly and indirectly caused more private money to be invested in land purchases.

Regardless of cause, rising asset values alone may benefit balance sheets but do little for profitability and cash flow. Profitability measures, as stated above, should improve in the near term within the index.

Table 2 illustrates recent trends for the individual KPIs that make up the Financial Health Index. ‘Current status’ signs reflect the strength or weakness of each metric in 2022. Arrows within the ‘recent trends’ column reflect the direction of that each KPI is trending over the last few years.

Table 2. Scorecard of recent trends

U.S. Cow-Calf Financial Health Scorecard - 2022			
Metric	Category	Current Status	Recent Trend
Current Ratio	Liquidity	~	↔
Debt-to-Asset Ratio	Solvency	+	↑
Term Debt Coverage Ratio	Repayment	~	↔
Operating Profit Margin	Profitability	-	↑
Operating Expense Ratio	Profitability	~	↔
Return on Assets	Efficiency	~	↑
Financial Health Index		~	↑

Summary & Conclusions

Strong financial health for the cow-calf sector requires both a positive business and economic climate, as well as an individual producer empowered with the resources and information to make the best decisions for their unique situation. Based on the results and analysis of the USRSB Cow-Calf Financial Health Index provided above, as well as other research and information, a few general recommendations can be offered as areas of focus for improving the long-term financial health and viability of the industry.

The foundation for cow-calf financial health is a producer with adequate resources and training to dedicate to financial management and planning, an area often limited by time and resource constraints. With that foundation, one means to improving financial health is a continued focus on maintaining a low-cost mindset, recognizing this is often easier said than done. Improvements in different financial metrics can be achieved depending on whether the primary target is fixed or variable costs. Gains to producer financial health can also be achieved through increases in production efficiency, which at its most basic level equates to producing more ranch output with fewer resources. Improvements to financial or production efficiency would be observed through multiple KPIs within the Financial Health Index. Lastly, it is important that the beef industry remains attentive to meeting the continually higher expectations of the consumer, supporting dollars and profitability flowing back to the cow-calf producer.

Ensuring the financial health of the cow-calf segment is critical to the sustainability of the overall U.S. beef supply chain. The USRSB Cow-Calf Financial Health Index provides a framework for monitoring the status of the industry as well as a tool for evaluating strengths, weaknesses, and changes over time. Financial viability is necessary for beef producers to remain in business and to continue to provide the positive environmental and social benefits of beef cattle production while delivering high quality protein to consumers around the globe.

Sources

U.S. Department of Agriculture, Economic Research Service. ARMS Farm Financial and Crop Production Practices. <https://www.ers.usda.gov/data-products/arms-farm-financial-and-crop-production-practices/>

Appendix

Table 3 illustrates individual indexed KPI's on a yearly basis along with the final Financial Health Index. Data points are color coded to reflect deviation from the mean both across metrics (horizontally) and across time (vertically).

Table 3. Individual KPI values that make up the USRSB Cow-Calf Financial Health Index

Year	Current Ratio	Debt-to-Asset Ratio	Operating Profit Margin	Operating Expense Ratio	Return on Assets	Term Debt Coverage Ratio	Financial Health Index
1996	0.75	-1.03	-1.05	-2.21	-1.98	-1.71	-1.87
1997	0.90	-0.67	1.10	-0.23	0.78	1.47	0.79
1998	-0.32	-0.58	0.58	-0.45	0.39	-0.55	0.01
1999	-0.93	-1.29	0.73	-0.42	0.39	0.03	-0.03
2000	0.45	-1.11	0.07	-0.47	-0.40	-0.41	-0.38
2001	1.36	-0.76	-0.47	-0.75	-0.79	-0.84	-0.66
2002	-2.76	-1.47	-1.16	-1.40	-1.58	-1.27	-2.03
2003	-0.16	-1.20	0.42	0.15	0.19	0.17	0.09
2004	-0.16	-0.50	1.04	1.12	0.78	1.18	0.98
2005	0.45	0.30	1.65	1.80	1.96	1.62	2.01
2006	0.45	0.21	0.42	0.10	0.58	0.03	0.46
2007	0.29	0.47	0.81	-0.50	0.58	0.17	0.46
2008	-0.32	0.03	-1.13	-1.30	-1.19	-1.13	-1.32
2009	-0.16	-0.06	-0.79	-0.95	-0.60	-1.13	-0.90
2010	1.97	-0.06	0.49	-0.23	0.58	0.32	0.60
2011	1.06	0.03	1.33	0.33	1.57	1.33	1.38
2012	1.21	0.56	0.67	0.63	0.58	1.18	0.98
2013	0.45	0.47	-0.02	0.90	-0.79	1.18	0.25
2014	-0.77	-1.20	1.76	2.27	1.96	1.90	1.85
2015	-0.93	-0.50	0.19	1.62	-0.01	0.03	0.31
2016	-1.39	0.65	-1.01	0.82	-0.60	-0.70	-0.51
2017	-1.54	0.03	-0.04	0.55	0.19	-0.26	-0.04
2018	-0.47	1.09	-0.25	-0.15	-0.20	0.03	-0.11
2019	-0.16	0.56	-1.21	-0.42	-0.99	-1.42	-0.99
2020	-0.32	1.71	-1.71	-0.20	-1.19	-0.12	-0.85
2021	0.60	1.88	-1.72	-0.32	-0.60	-0.70	-0.62
2022	0.45	2.41	-0.72	-0.28	0.39	-0.41	0.14