



2016

FINBIN

Report on
Minnesota Farm Finances

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Center for Farm Financial Management

UNIVERSITY OF MINNESOTA

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2016 FINBIN Report on Minnesota Farm Finances

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The 2,252 Minnesota farms included in the FINBIN database represent a broad cross-section of Minnesota production agriculture. While there is no “typical” Minnesota farm, these farms include a large enough sample to provide a good barometer of commercial farming in Minnesota. FINBIN data is provided by farms that participate in Minnesota State Farm Business Management Education programs and the Southwestern Minnesota Farm Business Management Association. These farms represent about 3 percent of the farms in the state and 10% of commercial farms with sales of over \$250,000.¹

Highlights

- Despite a second consecutive year of record crop yields, net income for Minnesota farms in 2016 was only slightly improved from the previous year. The median net farm income for all Minnesota farmers included in FINBIN was \$35,636, up from \$27,078 in 2015.
- Crop farm earnings rebounded somewhat from historically low levels of 2014 and 2015. The median crop farm earned \$46,348 in 2016, up from \$27,462 in 2015. Prices continued their decline that started in 2014, but price declines were again offset by record crop yields.
- Dairy farm profits declined for the second consecutive year. The median dairy farm earned \$27,560 compared to \$42,667 in 2015. The average price received for milk was \$16.57 per hundred pounds, down from \$17.95 in 2015.
- Pork producer earnings, while still historically low, improved slightly. The median pork producer earned \$26,847, up from \$2,861 in 2015.
- The median beef producer broke even in 2016, making just \$231. The median beef farm did not produce any income toward meeting family living needs.
- The average farm earned a rate of return on assets of 2.0%, up from 1.2% in 2015 (based on adjusted cost or book valuation of assets). Liquidity held almost constant. Working capital declined by only \$5,000 for the average farm. Term debt coverage averaged 1.04:1, meaning that the average farm earned just enough to cover scheduled debt payments.
- Government payments were down 33%, at \$16,801 for the average farm. Payments represented 3% of gross revenue.
- The average farm’s net worth increased by almost \$60,000. About half of that net worth growth resulted from farm and non-farm earnings while the other half resulted from increases in the estimated market value of farm assets. The average farm’s debt to asset ratio was unchanged at 42%.
- Regionally, earnings were mixed. Earnings were highest in Northwest and Southwest Minnesota, while earnings were very low in the North Central/East Central region.
- As is usually the case, profits generally increased with farm size. However, when measured based on rate of return on assets, mid-sized operations had the economic advantage.
- The average family spent \$59,332 on family living expenditures, down 2.5% from 2015.

Below are financial trends for these farms over the past three years.

¹ Minnesota Ag News – Farms and Land in Farms, United States Department of Agriculture, National Agricultural Statistics Service, Washington, D.C., February 17, 2017.

Highlights (MN Average)	2014	2015	2016
Gross revenue (\$)	886,239	785,941	780,209
Total expense (\$)	788,908	741,421	721,892
Average net farm income (\$)	97,331	44,520	58,317
Median net farm income (\$)	42,754	27,478	35,636
Rate of return on assets (%)	3.8	1.2	2.0
Rate of return on equity (%)	3.7	-0.8	0.4
Corn yield (bu.)	158	198	200
Soybean yield (bu.)	43	53	56
Spring wheat yield (bu.)	64	69	67
Corn price received (bu.)	\$4.37	\$3.74	\$3.42
Soybean price received (bu.)	\$11.67	\$9.45	\$9.07
Spring wheat price received (bu.)	\$6.33	\$5.26	\$4.78
Milk cows per dairy farm	179	184	196
Production per cow (lbs)	23,428	23,775	24,398
Milk price received (cwt)	\$24.45	\$17.95	\$16.57
Market hog price / cwt. sold	\$75.00	\$54.84	\$49.69
Wean pig price paid / head	\$46.06	\$42.78	\$39.71
Finished beef price / cwt. sold	\$150.59	\$148.24	\$118.87
Feeder calf price paid / cwt.	\$197.11	\$218.32	\$153.79

Table 1: FINBIN Farm Financial Database Highlights, 2014 - 2016

Profitability

Minnesota farms experienced a fourth consecutive year of low profits in 2016. The median net farm income for all farms was \$35,636, up slightly from \$27,478 in 2015 (Figure 1). There have not been two consecutive years with earnings as low as 2015-2016 in the 21 years included in the FINBIN database. Remarkably, Minnesota farms produced record crops in each of those past two years. Over 30% of the farms analyzed lost money in 2016.

Crop farm earnings improved somewhat from extremely low levels of 2014 and 2015 but were still far below record earnings of the 2010 – 2012 period. In contrast, profits for all major types of livestock operations declined for the second consecutive year. In particular, profits for intensive pork and beef operations, those that do not also sell significant cash-crops, were very low or negative.

Average net farm income for all participating farms was \$58,318, up 31% from the previous year. The fact that average income was higher than the median (middle) indicates that the most profitable farms were profitable enough to positively skew the average for all farms. In 2016, however, this factor was not as large as has generally been the case in previous years.

Even with depressed prices, some farms were very profitable. The median net income for the most profitable 20% of these farms was \$197,478; however, the median income for the least profitable 20% was -\$60,592. As has been the case in each of the past four years, some very large operations reported very large losses in 2016.

Government payments were down in 2016. Most producers received an ARC payment for corn but payments were reduced due to high yields in 2015 and lower prices used to calculate the benchmark revenue. Payments for soybeans were negligible. Some farms, particularly in the northwest, received payments for wheat and other minor crops. (Payments included are the cash payments received in 2016 and actually accrue to the 2015 crop year.) The average farm received \$22,436 in total government payments in 2016, down from \$33,427 in 2015. Government payments represented 3% of gross farm revenue and 39% of net farm income.

While Figure 1 may make it look like farm earnings have just returned to “normal” returns of the late 90’s and early 2000’s, it is important

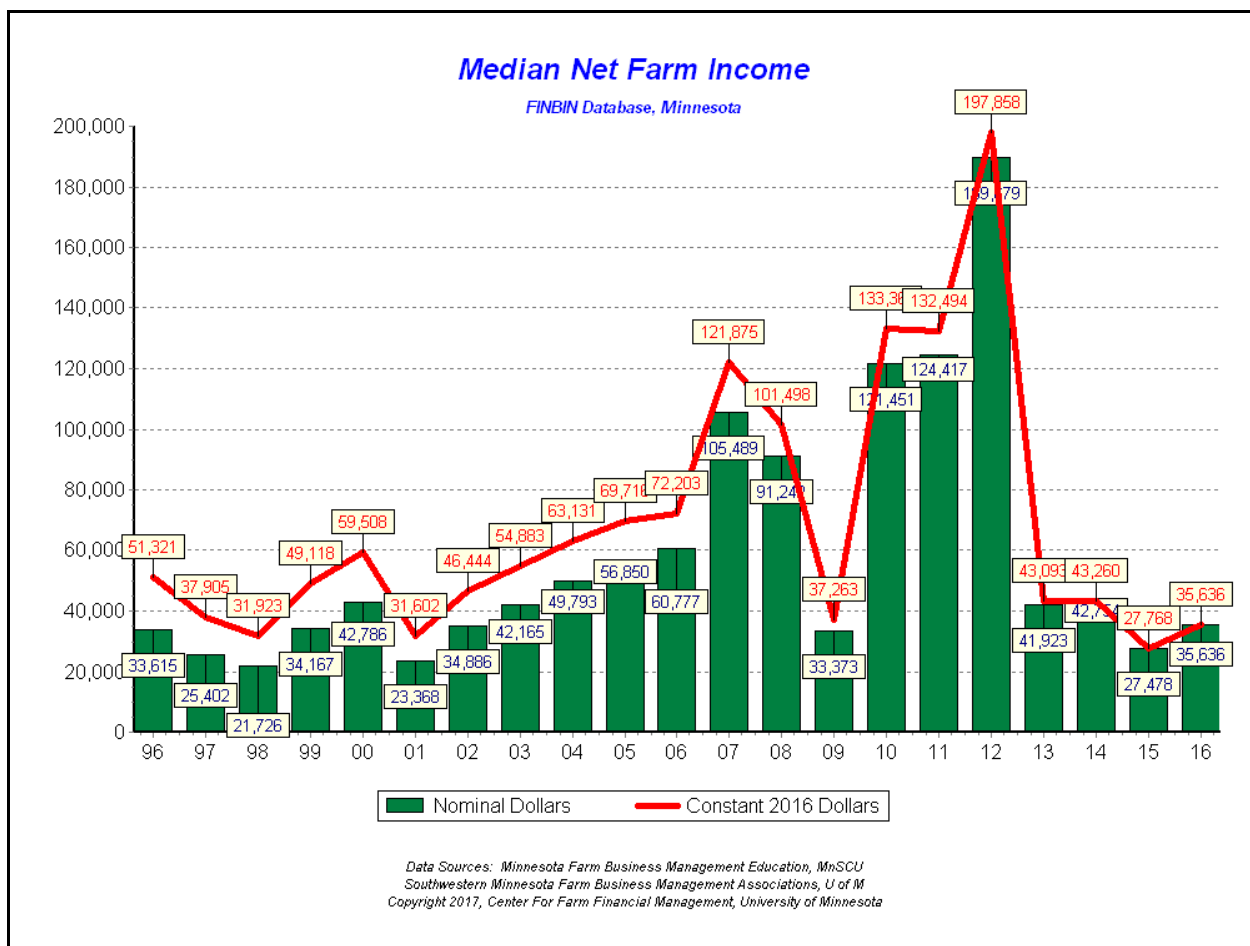


Figure 1: Median Net Farm Income

to note that today's farms are managing much larger operations (see Solvency below). The average farm earned a rate of return on assets (ROA) of only 2.0% (assets valued at adjusted cost basis²). Only in 2015 has this group of farms earned lower returns in the 21 year history of the FINBIN database.

Rate of return on equity (ROE) returned to positive territory in 2016 but just barely. Figure 2 shows the historic relationship between ROA and ROE. This relationship is a good barometer of sector profitability. Years when the ROE is higher than ROA are good years. When this is the case, borrowed capital earned more than its cost (ROA was higher than the interest rate paid on borrowed capital).

When ROE is lower than ROA, as in 2016, the average producer lost money on every dollar borrowed. Current low interest rates somewhat protected highly leveraged operations from the consequences of these low rates of return.

Asset valuation is a major factor in measuring rates of return. Figure 2 is based on the adjusted cost or book value of assets. This provides the best picture of returns on funds actually invested by business owners. When assets are valued at estimated market value, ROA and ROE were somewhat higher, at 2.4% and 2.0%, respectively. This includes capitalization of estimated increases in asset values during the year in addition to actual farm earnings.

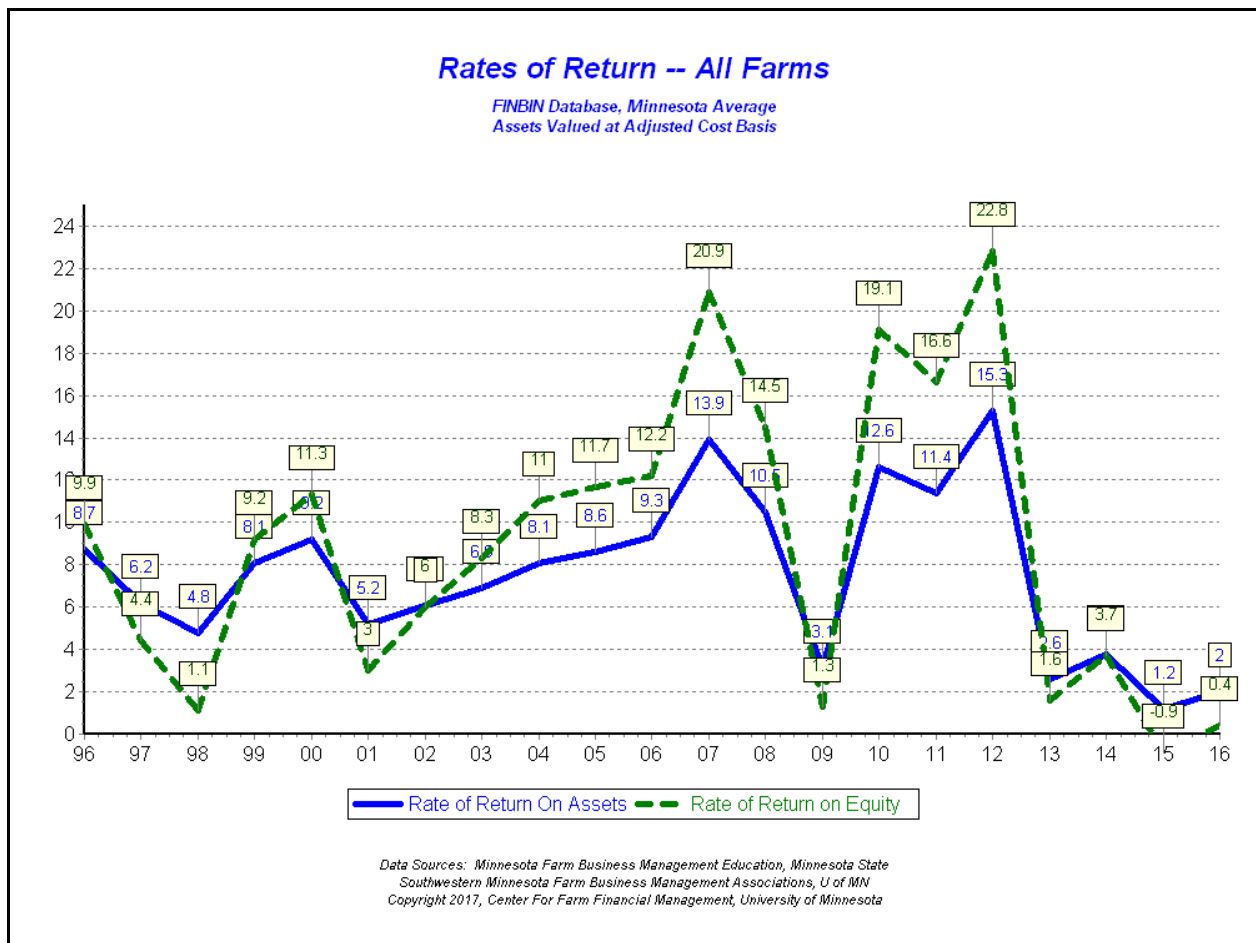


Figure 2: Rates of Return on Assets and Equity (%)

² FINBIN includes assets valued at cost (book) and at their estimated market value. Cost valuation of capital assets is based on "economic depreciation" which depreciates assets at a rate generally slower than allowed by tax law. The profitability measures displayed here are based on the cost value of assets.

Liquidity

Working capital has been a major focus for producers and ag lenders for the past several years. It is the major financial resource farms have to survive a period of depressed financial conditions like the one currently facing Midwest farmers. These farms built working capital rapidly during the “golden years” of 2007 through 2012. The average farm came into this period of declining profits in outstanding position to weather the storm.

Liquidity, based on working capital (current assets minus current debt) and the current ratio, was virtually unchanged for these farms during 2016. Working capital declined by about \$8,000 for the average farm. However, these farms, on average, have consumed \$219,000 of working capital over the past four years, roughly half of the \$439,000 they had at the end of 2012.

The current ratio for the average farm was 1.66:1 (Figure 3) at the end of 2016 (\$1.66 of current assets to cover each dollar of current debt), essentially unchanged from 2015. Current ratios for these farms have declined sharply over the past four years. Even with this decline, the average farm was still in a relatively strong liquidity position. But given this deterioration, more farms than usual are undoubtedly experiencing financial stress.

Working capital to gross revenue is probably a better measure of liquidity in that it relates the level of liquidity to business size. Figure 4 shows the relationship between working capital and gross revenue for these farms by type of farm. By this measure, crop farms maintained their liquidity position in 2016, but all types of livestock operations lost liquidity.

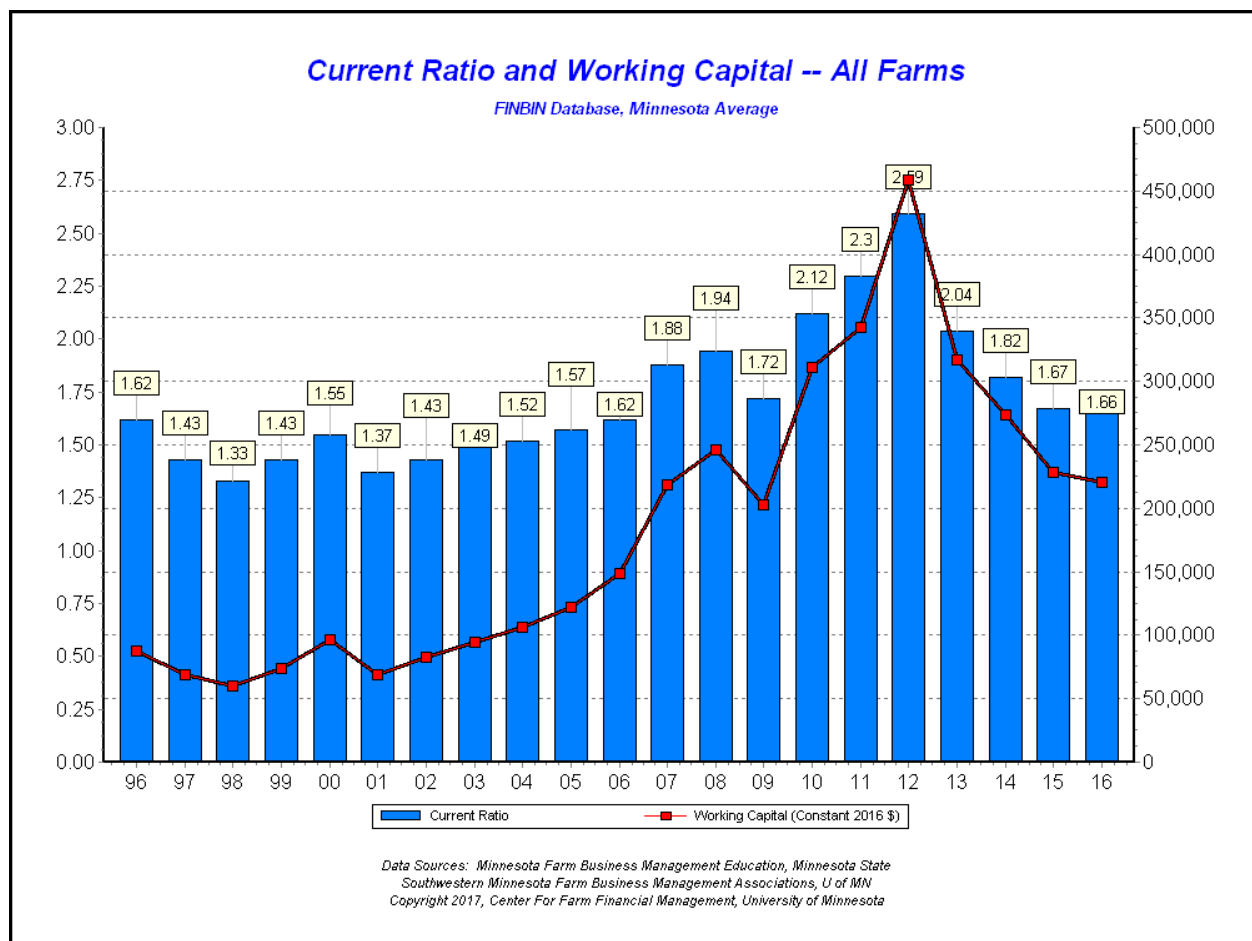


Figure 3: Current Ratio and Working Capital

The average crop farm still had almost 40% of a year's gross revenue available in working capital at the end of 2016, down from a peak of 53% in 2012. At 40% working capital to gross revenue, the average crop farm is still well above the recommended benchmark of 30%. The record crop of 2016 undoubtedly helped crop farms maintain their liquidity position. The concern, of course, is that the 2017 crop is unlikely to match that record. Of course, we said the same thing last year.

The average livestock farm, on the other hand, was below the recommended 30% benchmark. Dairy farms in particular, at 16%, are vulnerable to a sustained downturn. While dairy farms have never maintained high liquidity levels, this is a more serious concern now given the recent volatility of milk prices. Pork and beef farms each lost significant liquidity in 2016 and are much more vulnerable now than they have been for several years.

The data does not tell us how much debt has been restructured in recent years. It is likely that the liquidity position of a number of farms has been enhanced by refinancing current debt with longer term credit.

With continued declines in liquidity over the past three years, there are certain types of operation that are in weaker liquidity positions and are more vulnerable to continued low profits than the average farm:

- The 29 highly leveraged hog producers, those with debt to asset ratios over 60%, ended the year with negative working capital.
- The 256 highly leveraged crop farms improved their liquidity position somewhat but remained at only 4% working capital to gross.

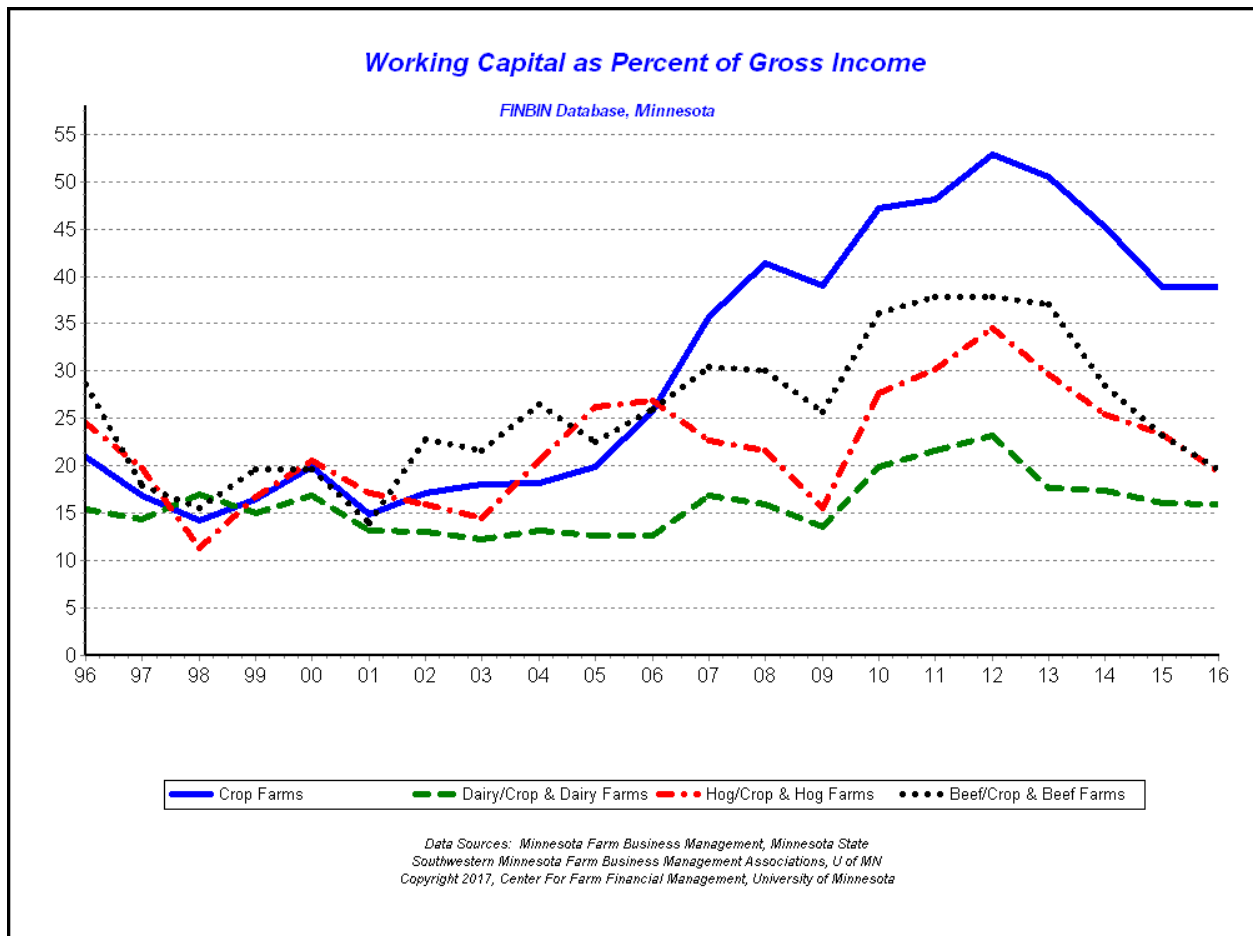


Figure 4: Working Capital to Gross Revenue

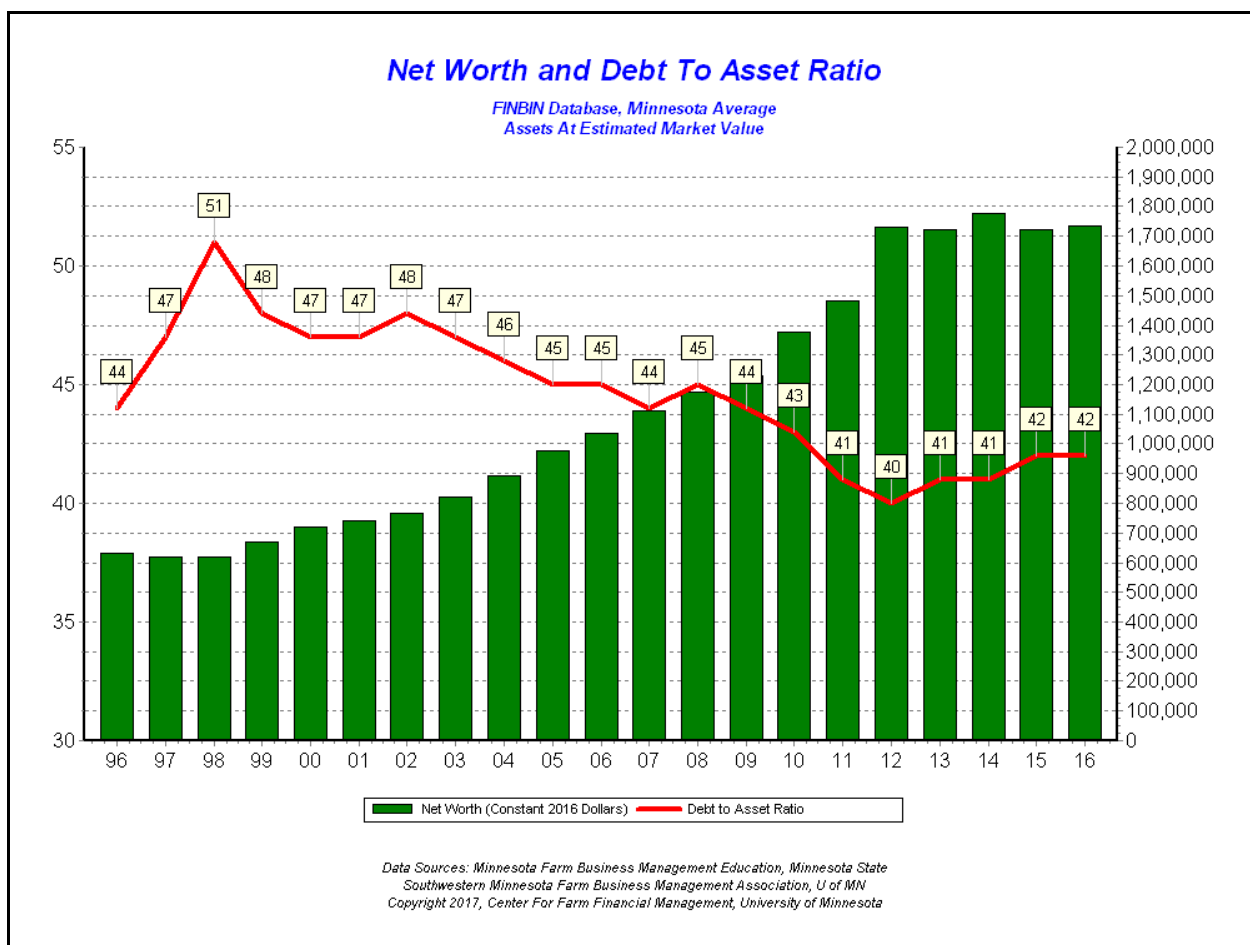


Figure 5: Debt to Asset Ratio (%) and Net Worth

Solvency

The average farm's net worth increased by almost \$60,000 in 2016. Of that, roughly half was "earned net worth change," resulting from farm and non-farm earnings exceeding owner withdrawals for family living and taxes. The other half resulted from changes in the estimated value of farm assets.

The average farm's debt-to-asset ratio was unchanged at 42% when deferred tax liabilities

are included. When deferred liabilities are excluded, the ratio was 32%.

The net worth levels depicted in Figure 5 are a bit deceiving in that they appear to show decreases in 2013 and 2015. In fact, the average farm has reported a net worth increase in every year included in the FINBIN database. Apparent decreases result from changes in the mix of farms analyzed.

Debt to Asset Ratio	Under 40%	Over 60%
Number of farms	963	561
Rate of return on assets	2 %	2 %
Rate of return on equity	2 %	-5 %
Current ratio	3:1	1:1
Working capital to revenue	54 %	2 %
Term debt coverage	1.6:1	0.7:1

Table 2: Impact of Financial Leverage, 2016

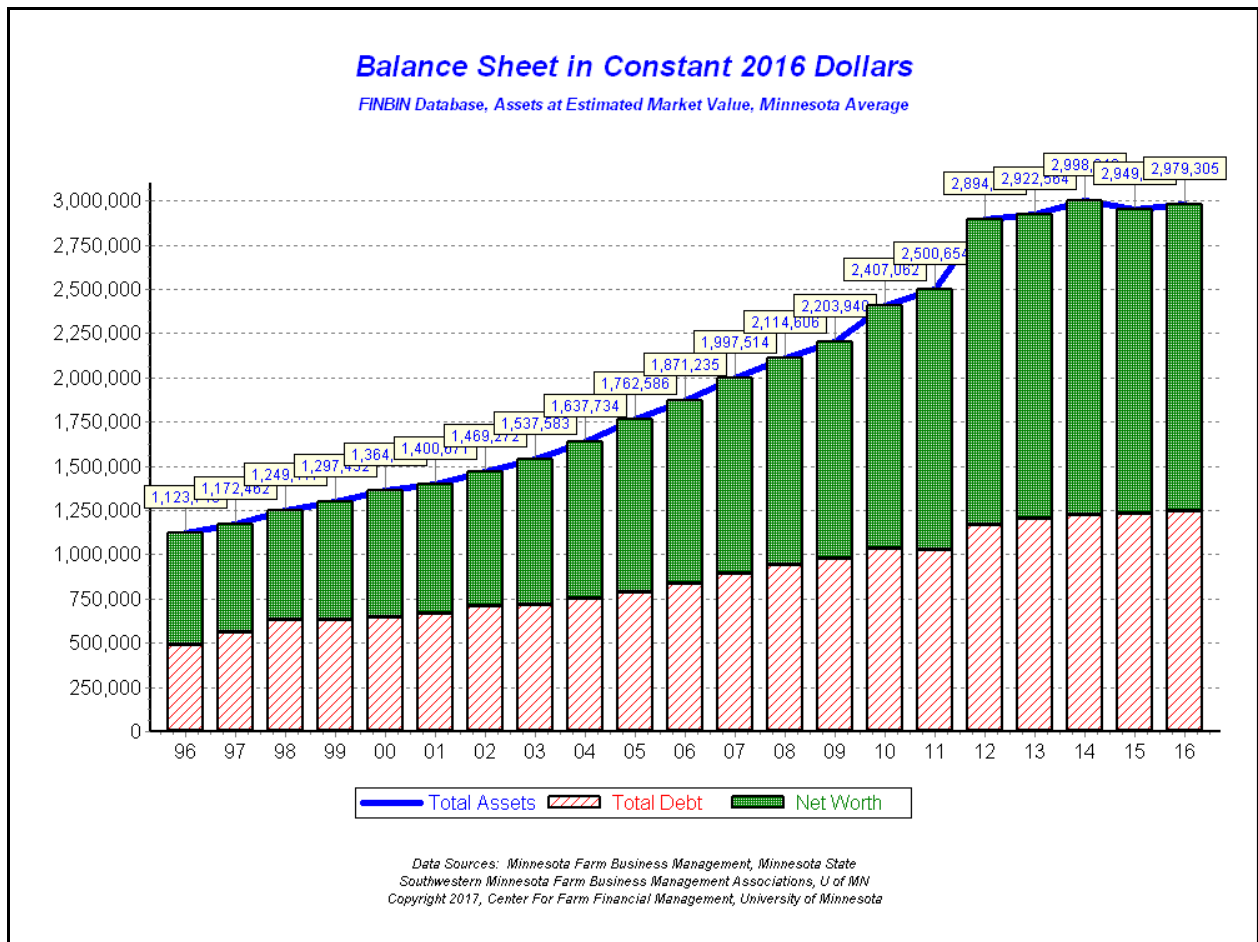


Figure 6: Balance Sheets at Market in Constant 2016 Dollars

Table 2 shows the impact of financial leverage (or debt-to-asset position) on the financial performance of these farms. Highly leveraged farms were just as profitable as lower debt farms, based on ROA, but were much more vulnerable based on liquidity and repayment capacity measures.

While debt-to-asset ratios have not changed a great deal in recent years, there have been major changes on the balance sheets of these Minnesota farms. The average farm has grown rapidly (Figure 6). In constant dollars, total assets have increased by over \$1.8 million over this period. Total debt increased by over \$750,000 over the same period. As a result, the average farm has gained over \$1.1 million of net worth over the past twenty-one years in today's dollars. This equates to 9% growth in net worth per year.

Net worth change can have two sources – the amount resulting from retained earnings and the amount resulting from changes in the valuation of assets. Over this twenty-one year period, from 1996 to 2016, 76% of net worth growth for these farms was earned. Retained earnings result when farm and non-farm income exceed the amount consumed by family expenditures and income taxes. The remaining 24% of net worth growth resulted from asset appreciation.

It should be noted that the individual farms included in FINBIN change somewhat each year, as some farms exit and new farms join the contributing educational programs.

Debt Repayment Capacity

Debt coverage is a primary measure lenders monitor when extending credit to businesses. The term debt coverage ratio (TDCR) compares dollars available for debt repayment after family living and income taxes versus scheduled debt repayment on term (non-current) debt. A TDCR of 1:1 indicates that income available for debt repayment exactly equaled scheduled payments. While other measures of business soundness, such as current ratio and debt to asset ratio, tend to change very little from year to year, TDCR shows much more variation. Therefore, it is probably a better indicator of year-to-year financial stress.

Debt coverage improved slightly for the average farm in 2016 after slipping to 0.82:1 in 2015. The average TDCR for these farms in 2016 was 1.04:1.

At 1.04 for the average farm, it is clear that nearly half the farms did not generate enough income to meet their debt commitments. For many this may be the third or fourth consecutive year of a shortfall. That doesn't mean they did not make their payments; it means that they had to consume working capital to meet their financial obligations.

Crop farms were the only farm type that reached the 1:1 level. All major types of livestock operation, dairy, beef and pork, failed to meet the 1:1 benchmark. Beef farms, on average, generated only 44 cents for every dollar of schedule debt payments. This lack of repayment capacity contributed to the \$30,000 reduction in working capital reported by the average beef farm.

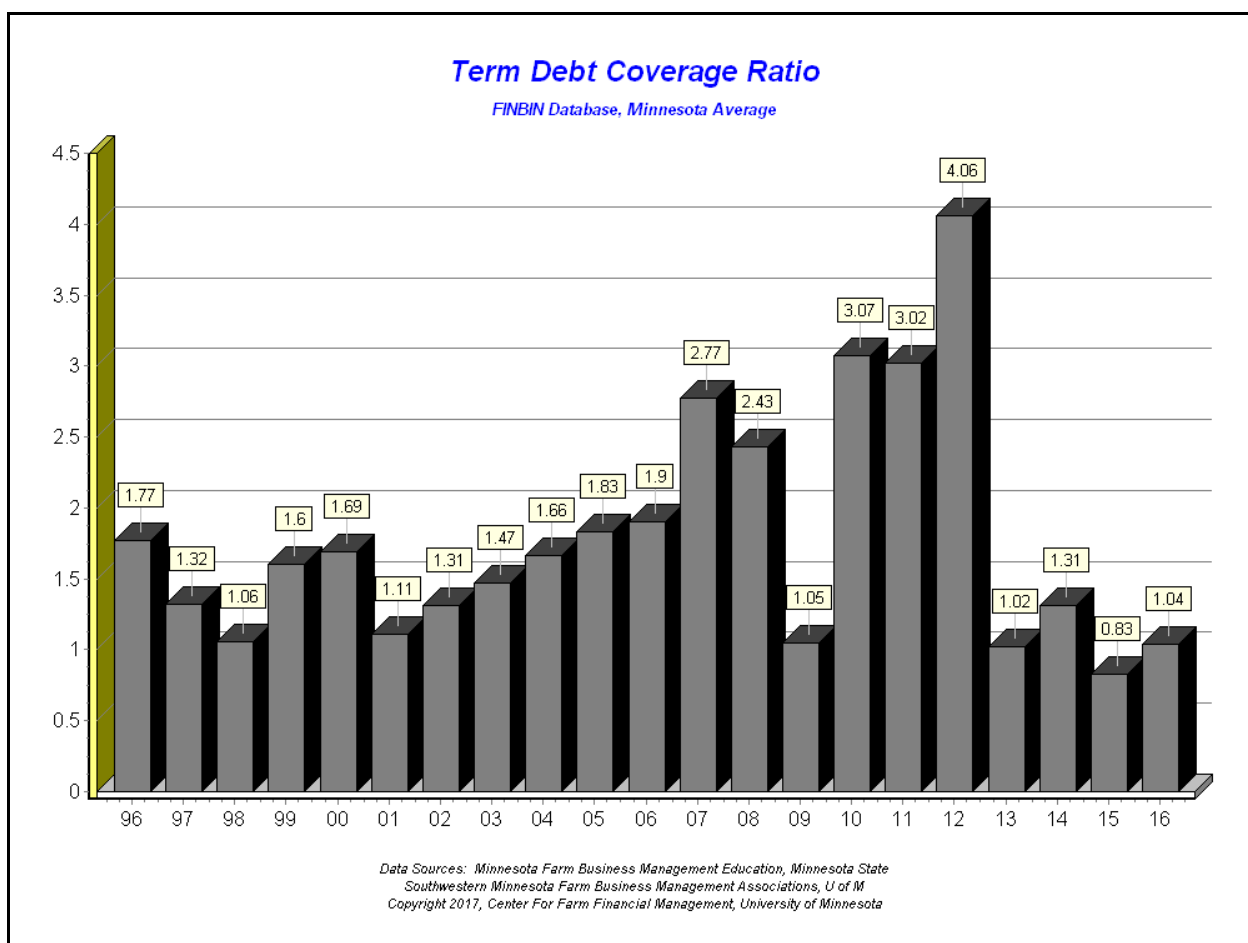


Figure 7: Term Debt Coverage Ratio

Regional Profitability

Incomes levels varied significantly by region of the state. In most regions, incomes were historically low even in cases where incomes were up from the previous year.

Incomes were up in the Northwest due to outstanding yields, lower rental rates compared to areas to the south, and less dependence on livestock agriculture. The median crop farm in the Northwest earned over \$125,000, far more than crop farms in other regions of the state.

Incomes were also up in the Southwest region and to a lesser extent in South Central and Southeastern Minnesota. However, in each case, 2015 incomes were so low that an increase is nothing to celebrate.

Incomes were lowest in the North Central/East Central region. This is traditionally a low income region of the state. While yields were high for the region, no type of farm was very profitable. In particular, beef farms were in the red in 2016.

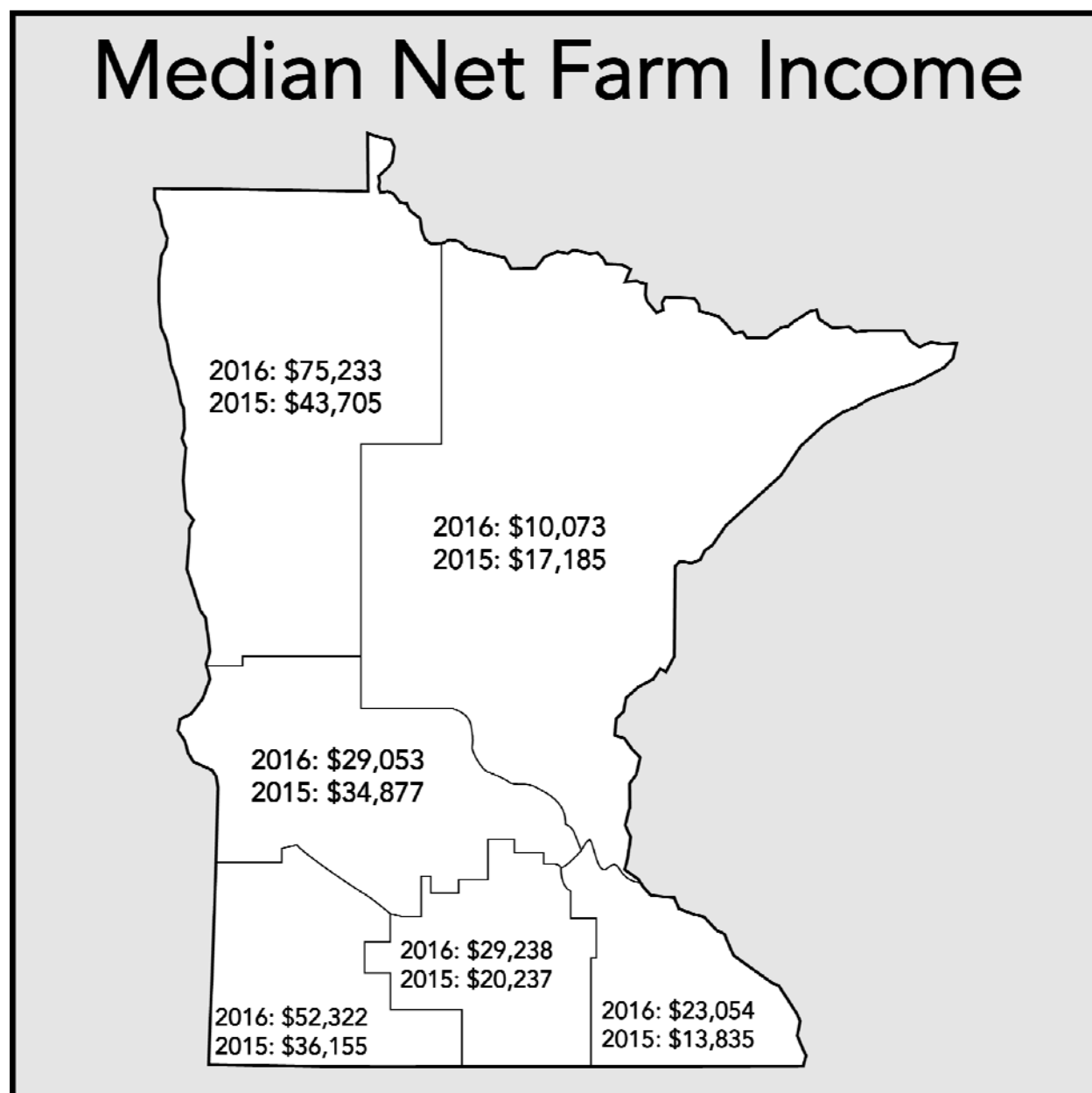


Figure 8: Median Net Farm Income by Region

Type of Farm³

While 2016 was not a stellar year for any of the major types of farming operation in Minnesota, crop producers fared much better than livestock producers. All farms that produced crops for sale or feed benefited from an outstanding growing season but that did not protect many livestock operations from decreased profits.

Crop Farms

The 1158 crop farms in the 2016 group earned a median net farm income of \$46,348, up from \$27,462 in 2015. As Figure 9 shows, while crop farm incomes were up, they were still low by historical standards. Yet, when combined with non-farm earnings of almost \$40,000, the average crop producer reported an earned net worth increase of over \$50,000.

Much like 2015, the big story for Minnesota crop producers was yields. For the second consecutive year, Minnesota producers broke yield records for corn and soybeans. According to USDA/NASS, Minnesota corn producers averaged 193 bushels per acre, 5 bushels over the record yield reported in 2015. Soybean yields were estimated at 52.5 bushels per acre, breaking the 2015 record by 2.5 bushels.

FINBIN contributing farms averaged even higher yields, with corn at 200 bushels per acre, 31 bushels over the 10 year average for participating farms. Soybeans averaged 56 bushels per acre, up 12 from the 10 year average, while spring wheat averaged 67 bushels, 9 bushels over the 10 year average.

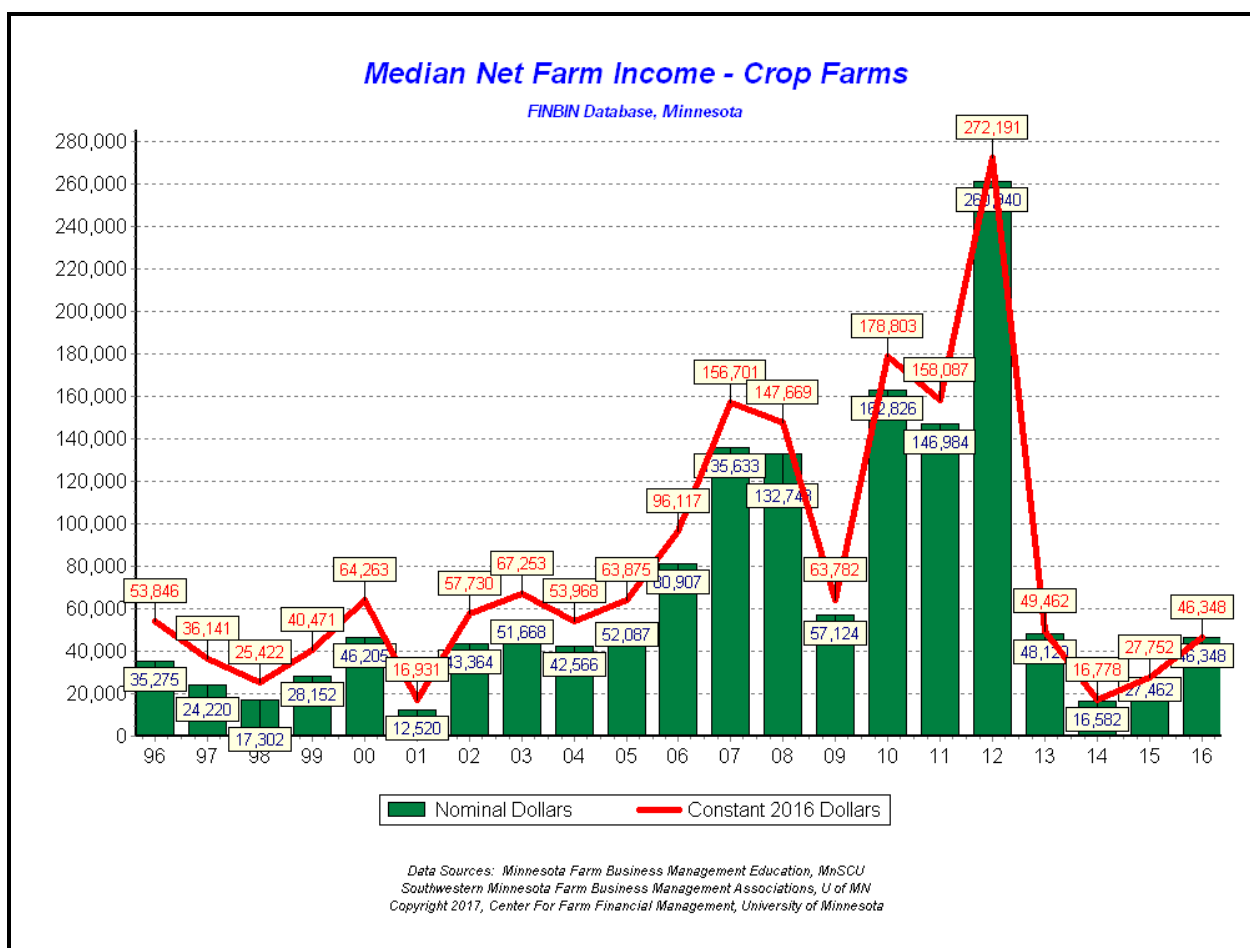


Figure 9, Median Net Farm Income, Crop Farms

³ Farms are categorized based on 70% of gross receipts from the respective enterprise. For this report, hog, dairy and beef farms were categorized based on 70% of gross receipts from the livestock enterprise or a combination of that enterprise plus crop sales.

Crop Farms	2014	2015	2016
Rate of return on assets	0.0%	1.4%	2.7%
Rate of return on equity	-2.3%	-0.4%	1.8%
Working capital to gross rev.	45%	39%	39%
Term debt coverage ratio	0.4:1	0.9:1	1.3:1
Net worth change	\$26,070	\$36,126	\$73,218

Table 3: Crop Farm Returns

Strong yields were not confined to Minnesota. Crops were generally excellent across the corn belt in 2016, resulting in burdensome supplies that weighed on prices. The average sales price for corn was \$3.42, down from \$3.74 in 2015. Soybeans fell from \$9.45 to \$9.07, while spring wheat prices fell by from \$5.26 to \$4.78/bu.

Producers were able to cut costs to try to adjust to continued low prices. For corn, seed expense was down 2%, fertilizer was down 10% (after decreasing by 11% in 2015), fuel was down 16%, and rent was down 2% on cash rented land. Total costs were down 5% for corn production, 3% for soybeans and 6% for spring wheat.

The net effect was that, even with record yields, producers lost \$17 per acre on corn production on cash rented land. But they made \$114 on soybean production, \$10 per acre on spring wheat, and \$23 per acre on sugar beets.

Given the weakened financial position of many crop producers after three years of low profits, record yields in 2016 likely saved some from major financial losses. Many producers are still facing a high degree of financial stress. For example, the 231 crop farms in the low profit 20% group lost \$65,000 in 2016. That group only has \$80,000 of working capital left. These farms need a better year, financially, in 2017.

Corn	2014	2015	2016
Yield (bu.)	158	198	200
Price received / bu.	\$4.37	\$3.74	\$3.42
Cost of production / bu.	\$4.57	\$3.77	\$3.62
Cost per acre	\$816	\$753	\$717
Soybeans			
Yield (bu.)	43	53	56
Price received / bu	\$11.67	\$9.45	\$9.07
Cost of production / bu.	\$10.71	\$8.34	\$7.88
Cost per acre	\$470	\$456	\$443
Spring Wheat			
Yield (bu.)	64	69	67
Price received / bu.	\$6.33	\$5.26	\$4.78
Cost of production / bu.	\$6.17	\$5.37	\$5.23
Cost per acre	\$389	\$372	\$349

Table 4: Crop Yields, Prices and Cost of Production for Major Minnesota Crops

Dairy Farms

Dairy farm earnings declined for the second year consecutive year following a very profitable 2014. The median net farm income for the 457 participating dairy farms was \$27,560, down from \$42,222 in 2015, a 35% decrease in earnings. The average dairy farm earned negative returns on equity capital (assets valued as cost or book value).

The average dairy farm's liquidity position was unchanged, with working capital to gross revenue of 16%. These dairy farms have traditionally carried less working capital than other types of farm. Their solvency position deteriorated slightly, with debt-to-assets increasing from 40 to 42%. Most troubling, their term debt coverage ratio dipped below 1:1, meaning that the average farm did not generate enough income to meet its debt obligations.

As has been the case for several years, the farms with the largest herds were most profitable. However, profits did not increase consistently with herd size. The median income for the largest herds, those with over 500 cows, was over \$130,000. Those farms also earned the highest ROA at 2.2%. However, the next largest herd size group, with 200 to 500 cows, generated median earnings of only \$25,000. They were the only size group to post a negative average ROA.

The average price received for milk decreased from \$17.95 per hundredweight (cwt) in 2015 to \$16.57 in 2016. The cost to produce milk also declined. On average, it cost \$16.79 per cwt to produce milk in 2016, down from \$17.50 the previous year. Total expense per cow decreased by 6%. Feed cost declined by 9%. Labor cost declined by 1%.

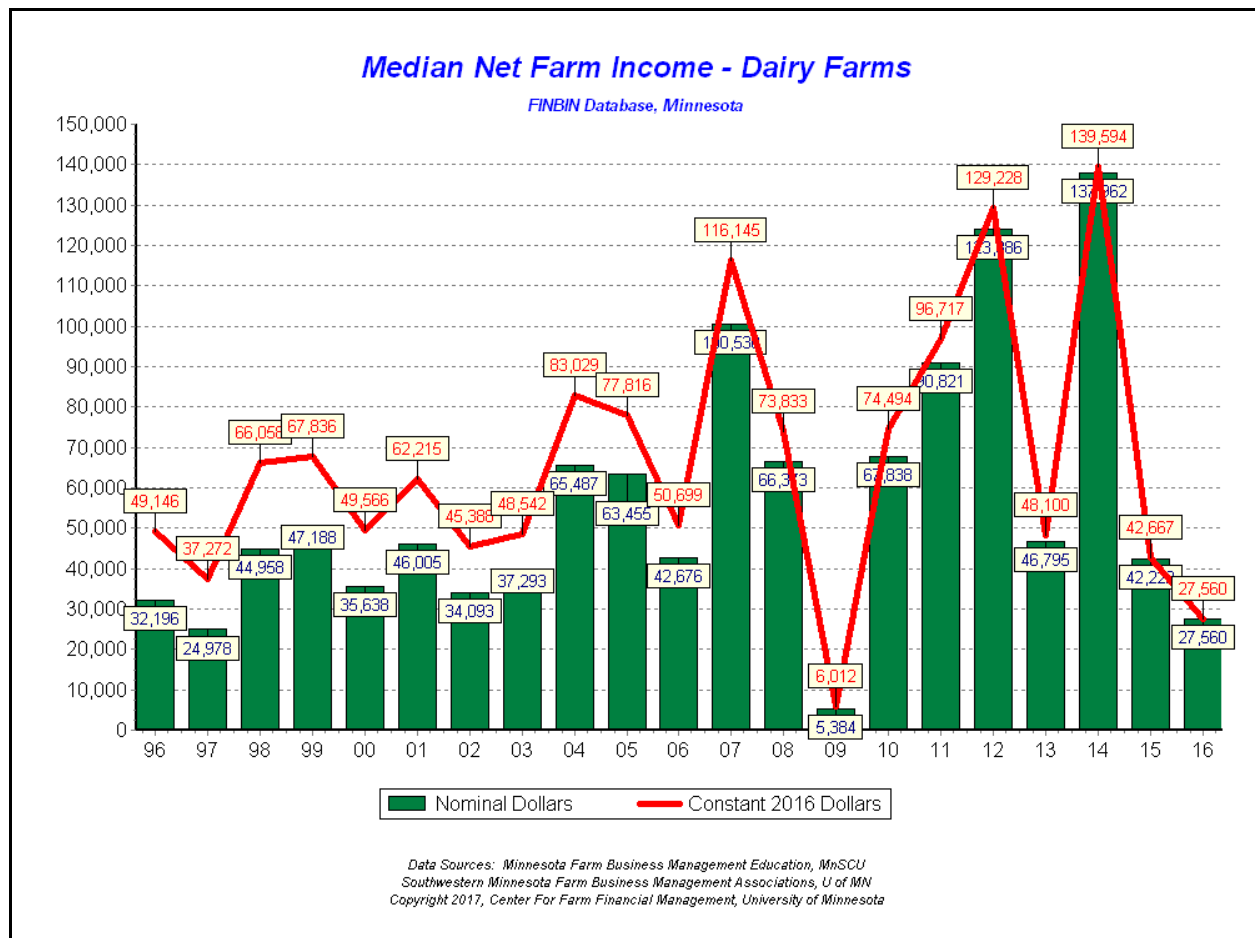


Figure 10, Median Net Farm Income, Dairy Farms

Dairy Farms	2014	2015	2016
Rate of return on assets	10.9%	2.1%	1.0%
Rate of return on equity	15.8%	0.6%	-1.4%
Working capital to gross rev.	17%	16%	16%
Term debt coverage ratio	2.5:1	1.0:1	0.8:1
Net worth change	\$211,015	\$43,576	\$36,176

Table 5: Dairy Farm Returns

One of the noticeable trends for Minnesota dairy farms in recent years has been the performance advantage of large operations. Milk production per cow averaged 24,398 pounds across all herds. But herds of over 500 cows averaged 27,085 pounds per cow. Herds of fewer than 100 cows averaged 20,151 pounds per cow.

Large herds did have higher costs per cow, with higher feed costs and significantly higher labor costs. Total cost per cow trended from \$2,526 for the smallest herds (1 – 50 cows), up to \$3,986 for those with over 500 cows. But on a per hundredweight basis, given higher production per cow, large herds produced milk at a lower cost than any other herd size. On the bottom line, the net return per cow was \$207 for large operations compared to \$48 for all smaller herds.

While profits for conventional dairy farms declined in 2016, organic dairies had a profitable year. Over the years, organic dairy herds have typically netted higher returns per cow than conventional herds. That pattern was temporarily reversed in 2014 but it has returned in a big way in the past two years. In 2016, organic herds netted \$1,680 per cow compared to \$105 for all conventional herds. The average price received for organic milk was \$35.30 per hundredweight. The median net farm income for organic dairy farms was \$129,635.

The University of Wisconsin is currently predicting higher prices for 2017, with a predicted mailbox price for Minnesota of around \$17.50. Feed prices are expected to be flat to just a bit higher. That would suggest somewhat improved earnings for Minnesota dairy farmers in 2017.

Dairy Farm Highlights	2014	2015	2016
Number of dairy enterprises	408	392	405
Average number of cows	180	184	196
Production per cow (lb)	23,428	23,775	24,398
Price received / cwt	\$24.45	\$17.95	\$16.57
Cost of production / cwt	\$20.13	\$17.50	\$16.79
Cost per cow	\$4,330	\$3,873	\$3,656

Table 6: Dairy Enterprise Highlights

Pork Farms

No group of Minnesota farms has ridden the financial rollercoaster like pork producers. They enjoyed outstanding earnings in 2014, but since, profits have collapsed. The median participating pork producers made \$26,847 from farm operations in 2016, up from \$2,847 in 2015.

While profits improved slightly, it appears that the increase resulted from earnings on crop sales rather than hogs. All pork enterprises were less profitable than in 2015. Both farrowing and finishing enterprises showed losses for the average producer. In fact, when only specialized pork producers who did not also report sizeable crop sales are included, the median farm lost almost \$5,000 in 2016.

Pork farm profits are very cyclical (Figure 11). The cycle was interrupted by disease in 2013, but it looks to be back on track. No other sector of Minnesota's farm economy has changed as much as the pork industry over the past few decades. There are far less pork producers than there used to be. Those remaining tend to be larger than other farm types. When they are profitable, their profitability is magnified by the size of their operations. When they are not profitable, their losses can also be magnified.

Participating pork operations tend to carry more debt than other farm types. The average pork farm's debt-to-asset ratio stood at 47% at the end

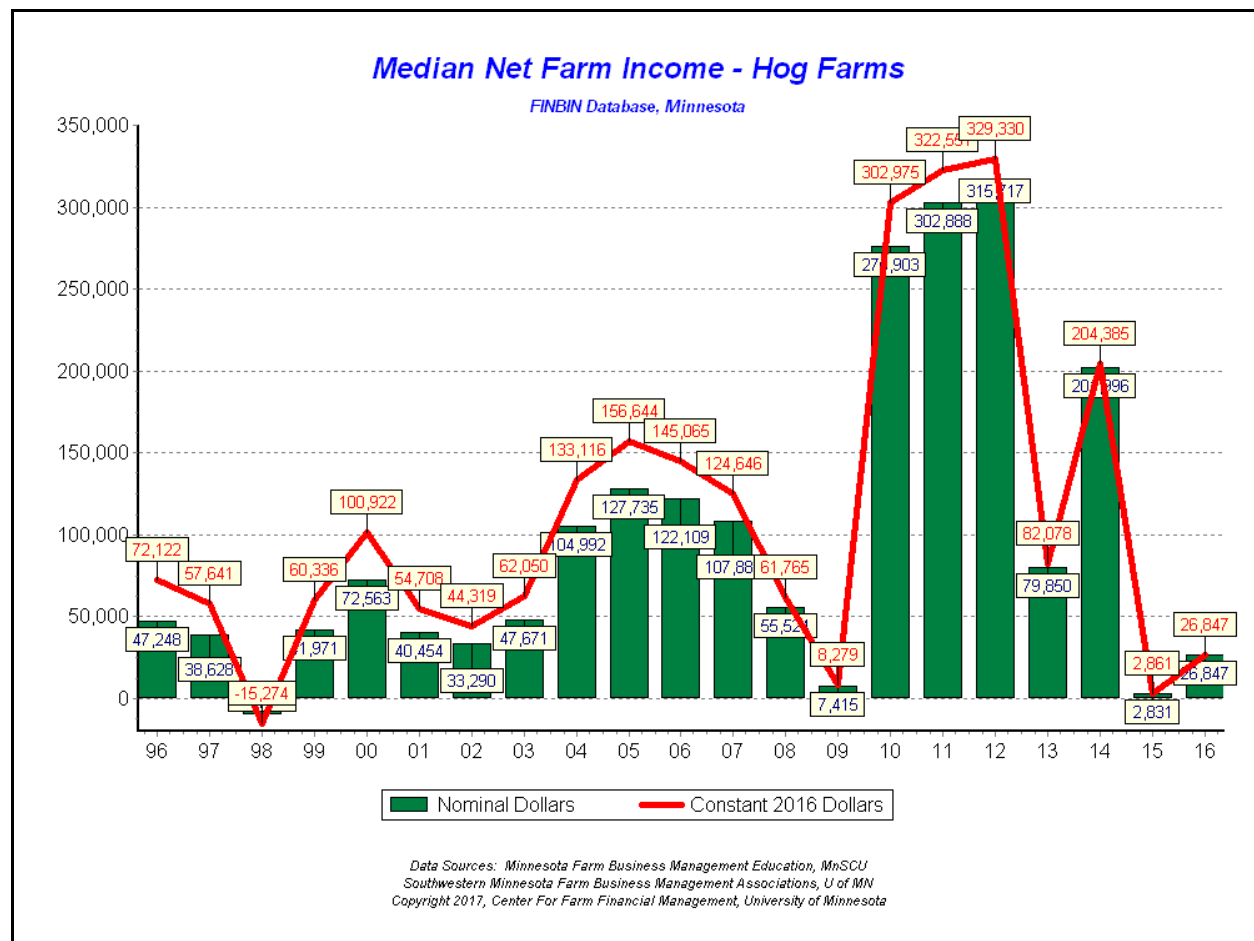


Figure 11, Median Net Farm Income, Hog Farms

Hog Farms	2014	2015	2016
Rate of return on assets	8.5%	-0.9%	1.0%
Rate of return on equity	12.5%	-4.9%	-1.7%
Working capital to gross rev.	26%	23%	19%
Term debt coverage	2.6:1	0.3:1	0.6:1
Net worth change	\$246,982	\$29,380	\$11,332

Table 7: Pork Farm Returns

of 2016. The average farm consumed more than \$100,000 of working capital in 2016. Their term debt coverage ratio was below the 1:1 benchmark in 2016 for the second consecutive year. While the average operation reported a net worth increase of \$11,000, their earned net worth change was \$-31,000.

The average price received for farrow-to-finish operations was \$66 per hundredweight carcass, down from \$75 the previous year. Feed costs were down 16%, but that was not enough to offset the price decrease. Farrow to finish operators lost \$135 on every litter farrowed after losing \$121 in 2015. We noted above that participating hog producers are, on average, larger than other types of farm. That is not true of these farrowing operations. In fact, most are small compared to their industry peers. Therefore they may not be an accurate barometer for industry trends.

Participating wean-to-finish operators operate on a much larger scale. The average wean-to-finish farm sold over 15,000 pigs. In 2016 these operations lost \$1.28 per head. Their price received per hundredweight carcass was \$66.86, down from \$76.10 in 2015.

Costs of production for finishers decreased by 6%, partially offsetting the decrease in market price. The cost to purchase a weaned pig was down over \$3.00 while feed costs were down 9%.

Industry experts are predicting that pork prices will be up a few dollars in the coming year. Given the current outlook, feed costs are not expected to change drastically, so there is hope that Minnesota pork producers will see stronger financial returns in 2017.⁴

Hog Farm Highlights	2014	2015	2016
No. farrow-to-finish farms	12	8	11
Average number of sows	372	431	416
Pigs weaned per sow	21.1	20.6	21.1
Price received / cwt (carcass)	\$104.32	\$74.63	\$66.16
Cost of production / cwt	\$97.47	\$78.96	\$74.93
No. pig finishing enterprises	64	65	67
Number of pigs finished	11,425	13,032	12,381
Price received / cwt (carcass)	\$100.46	\$73.69	\$66.86
Cost of production / cwt	\$87.70	\$76.10	\$69.95

Table 8: Pork Enterprise Highlights

⁴ Hurt, Chris, "Pork Industry Favored by Strong Demand," farmdocdaily.illinois.edu, April 10, 2017.

Beef Farms

In 2014, Minnesota cow-calf operations and beef finishing operations had their most profitable year in the FINBIN series. That profitability stimulated expansion and has now lead to over-production, which has sent prices spiraling downward in the past two years.

The median of the 158 beef operations in the farm management programs in 2016 made only \$231 from farm operations in 2016. That was an improvement from 2015 when they lost \$6,857 (Figure 12).

Much like hog producers, these producers made more on their cropping operations than on beef production. The median of the 60 specialized beef producers, those who did not sell substantial cash crops, lost almost \$12,000. Both cow-calf producers and cattle finishers reported losses on their livestock enterprises.

Return on equity was negative for the second consecutive year (Table 9). Debt coverage was also again under the 1:1 benchmark, meaning that the average producer's earnings were short of covering debt obligations for a second year. The average producer's working capital has been cut in half in the past two years. While net worth increased, the average farm reported an earned net worth loss of almost \$15,000, meaning that all net worth growth resulted from increased asset valuation.

After six consecutive years of profitability, cow-calf operations lost \$84 per cow in 2016. The average price received for beef calves was \$156 per hundred pounds (cwt), down \$70 from the 2014 record.

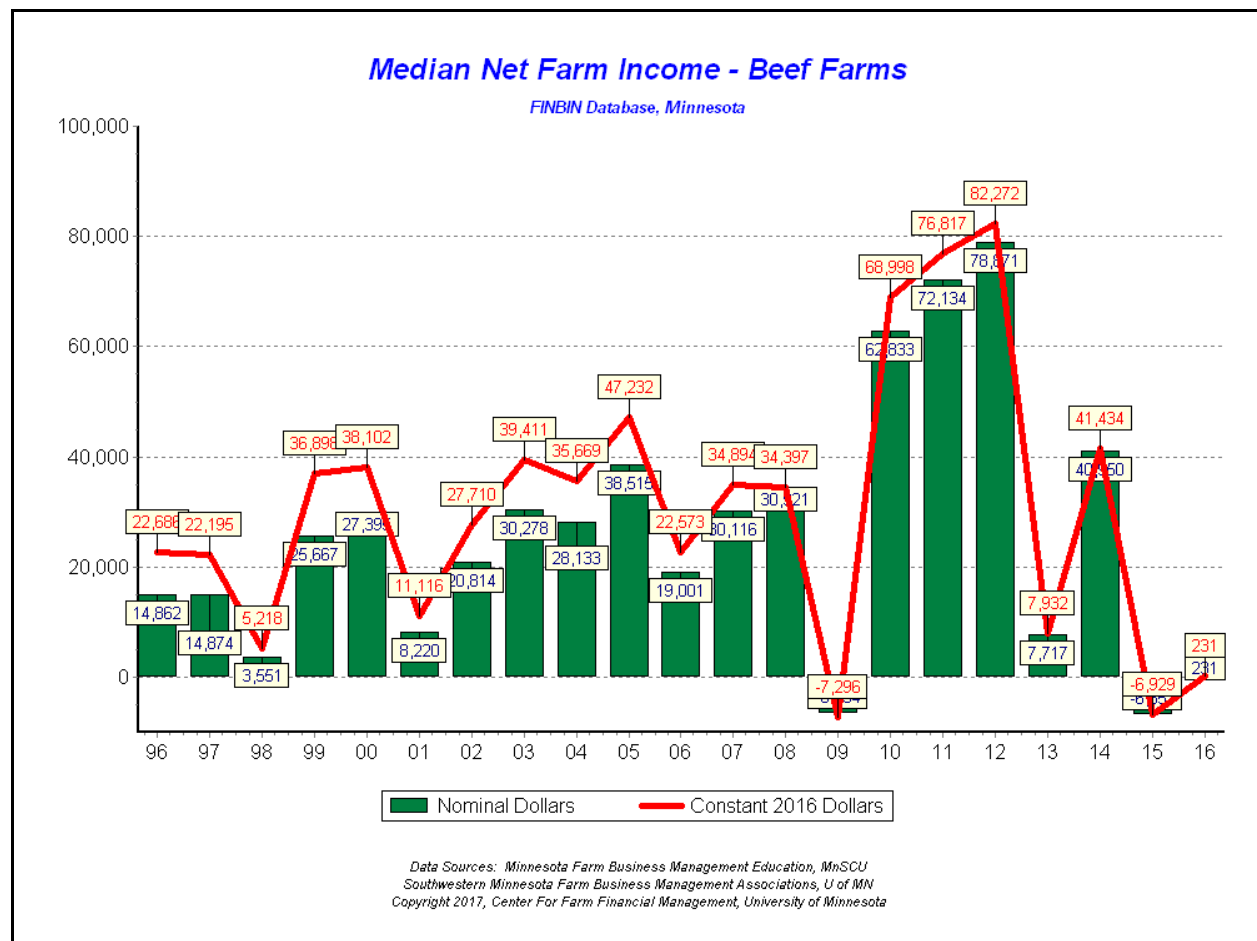


Figure 12: Median Net Farm Income, Beef Farms

Beef Farms	2014	2015	2016
Rate of return on assets	6.2%	-2.2%	-0.5%
Rate of return on equity	8.7%	-9.0%	-6.2%
Working capital to gross rev.	29%	23%	20%
Term debt coverage ratio	1.9:1	0.1:1	0.4:1
Net worth change	\$111,733	\$14,627	\$15,095

Table 9: Beef Farm Returns

Costs declined by 5% for cow-calf operators. Feed costs were down by 8%. Including labor and management charges, it cost \$171 to produce a hundred pounds of feeder calf on a live-weight basis. That means that the average producer lost \$15 on every 100 pounds produced.

While they still reported losses, cattle finishers fared better than in 2015 when cattle prices dropped at year-end after many had filled their feedlots. The average price received for calf sales was \$119 per cwt, down from \$148 the previous year. Fortunately, costs were down even more.

The cost to produce 100 pounds of beef dropped from \$173 to \$127. Most of this decline was driven by the reduced cost of feeder cattle, which dropped from \$218 to \$154 per cwt. Feed cost were virtually unchanged.

Expansion of the national beef cow herd has been ongoing for the past three years. Projections are that beef supply will continue to increase into 2017. Estimates are that slaughter cattle prices will decline another 6 to 8 percent this year with an even more dramatic decrease in feeder cattle prices.⁵ With expectations for constant feed prices, more losses are likely for beef producers in 2017.

Beef Farm Highlights	2014	2015	2016
No. of cow-calf enterprises	105	112	114
Number of cows	68	70	68
Calf weaning percentage	87.0	89.8	89.0
Calf sales price / cwt	\$216.67	\$205.60	\$156.33
Calf cost of production / cwt	\$130.01	\$160.14	\$170.96
No. beef finishing enterprises	64	61	74
Number of head finished	277	228	238
Average daily gain	2.72	2.49	2.64
Purchase price per cwt.	\$197.11	\$218.32	\$153.79
Finished beef price / cwt	\$150.59	\$148.24	\$118.87
Finishing cost of production / cwt	\$124.74	\$173.12	\$127.02

Table 10: Beef Enterprise Highlights

⁵ James Mintert, "Cattle Industry Still in Expansion Mode, At Least for Now," farmdocdaily.illinois.edu, February 6, 2017.

Size of Farm

Figure 13 shows how farm income varied with farm size. The blue line shows the median net income of all farms within each size group. The green line shows the median income of the high income farms, and the red line shows the median of the low income farms in each size group based on gross revenue.

While large operations in general earned more than smaller operations, that difference was not as large it has been in the past. In fact, there was more variability within the size groups than between them in 2016. There were large numbers of farms within each group that were very profitable. But there were also large numbers in each group that experienced substantial financial losses.

There are producers who, for various reasons, suffer financial losses every year. It is not unusual for small operations that may rely on non-farm earnings for most of their living needs to suffer losses. What has changed in recent years is the size of losses suffered by some very large producers. In each of the past four years, many large farms have not only lost money but they have lost a lot of money. On the other extreme, there are still many large operations that have been very profitable, even in these challenging financial times. In 2016 this pattern held across all enterprises, crop farms, dairy farms, and pork producers.

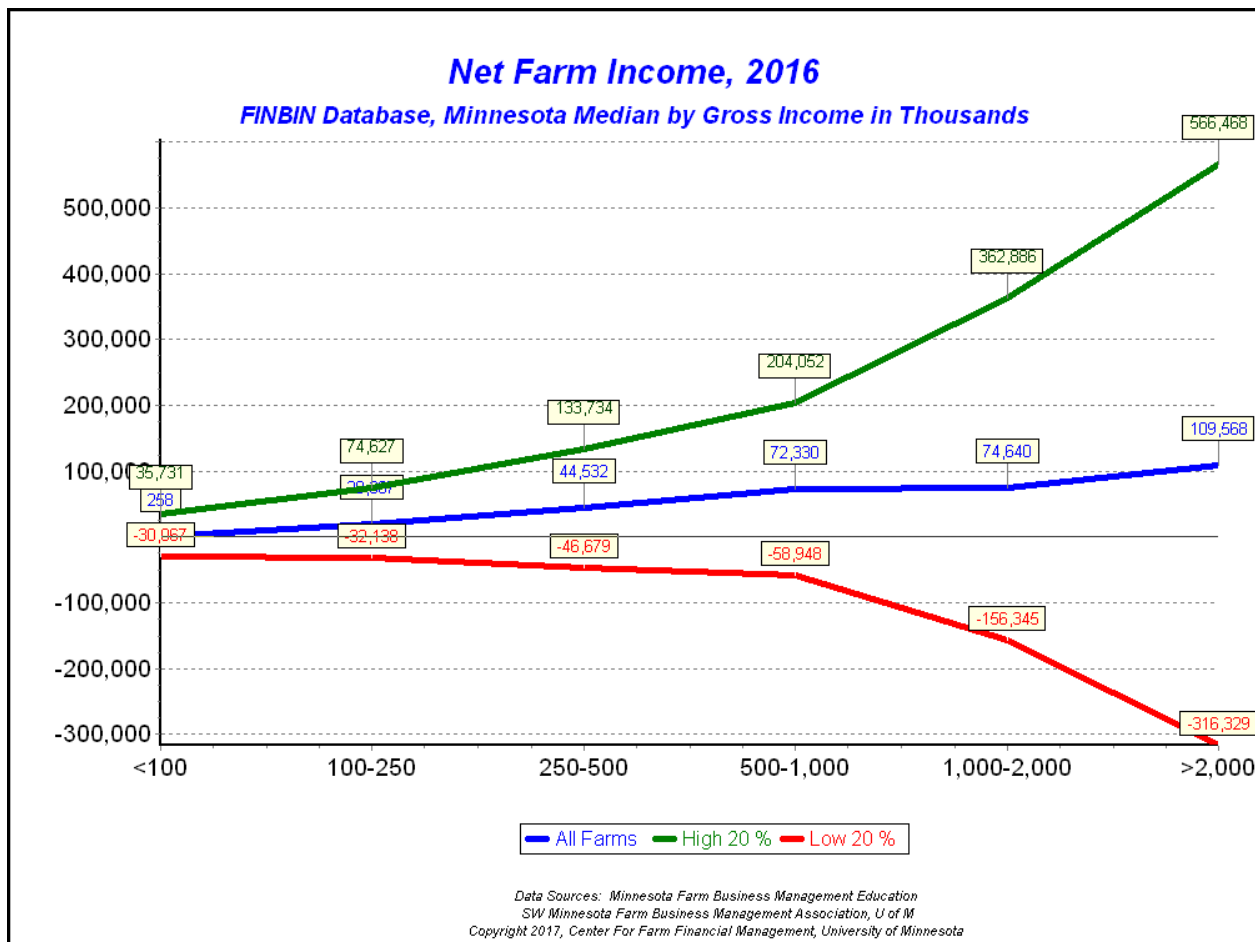


Figure 13: Net Farm Income by Farm Size

Larger farms obviously also have higher investments in land, machinery and other capital. Figure 14 compares the rates of return on assets for these different size groups. Looking only at the overall medians, the blue line, no size group earned a profitable return on assets in 2016; i.e., even with current low interest rates, the median farm in each group lost money on borrowed capital. This contrasts with earlier years, particularly 2010 – 2012, when returns were very strong. In 2012, for example, ROAs ranged from 3.1% for the smallest farms to 16.4% for the largest farms.

In each group, though, there were high income farms that did generate profitable rates of return. And there were large numbers of farms in each group that lost money on every dollar they invested in their operations.

In profitable years, large farms' incomes are multiplied by volume. In low income years like 2016, size can work against operations as losses are multiplied. While this was not the case for all large operations in 2016, it does appear to have been the case for a subset of large operations of every farm type.

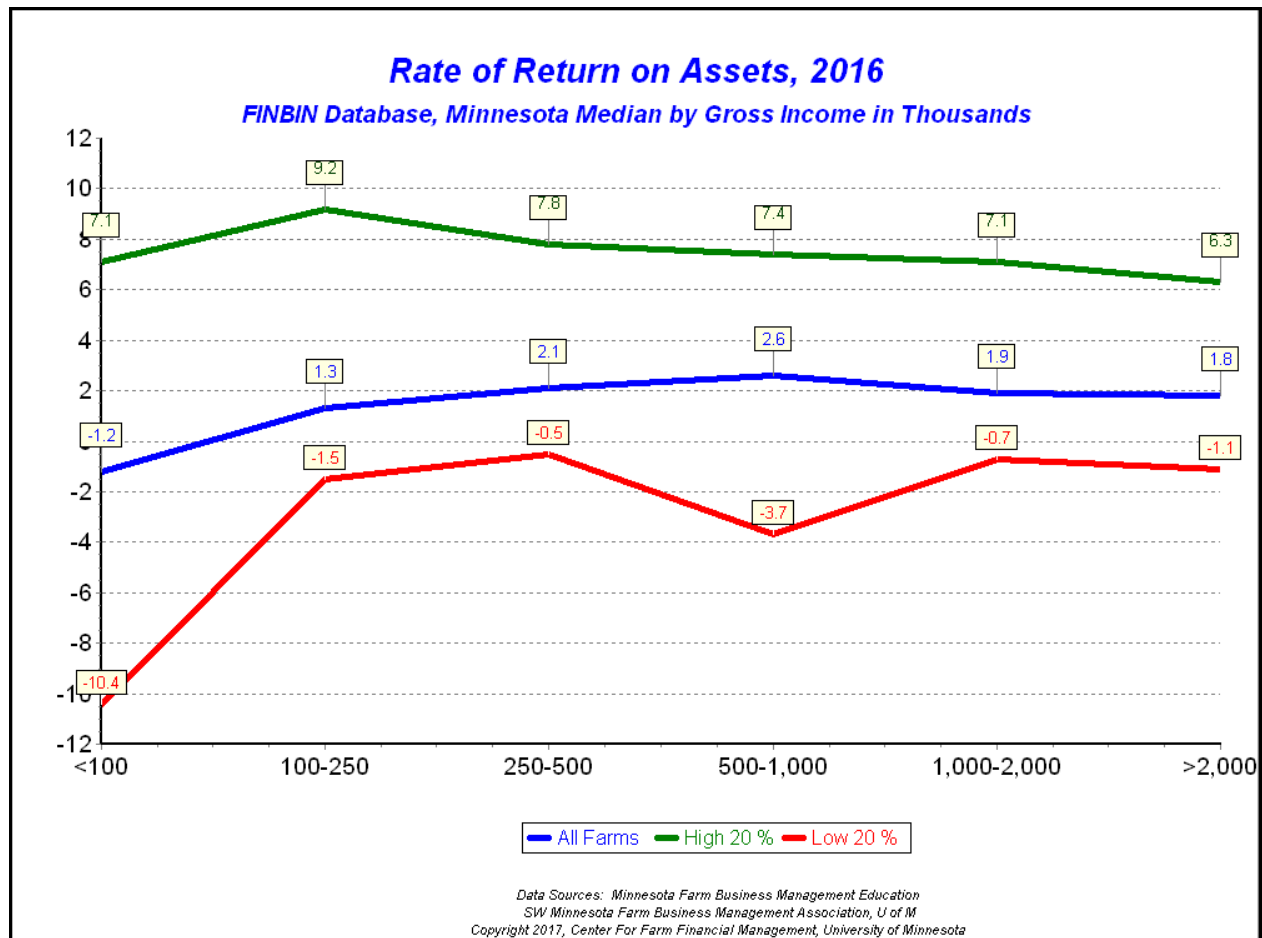


Figure 14: Rate of Return on Assets by Farm Size

We have tracked this contrast between large farms that are very profitable vs. those large operations that are struggling financially for the past four years, particularly for crop farms. Generally the data indicates that profitable farms have performed a little better in several different areas, including production, capital investment, cost control, and marketing. When combined, all of those small differences add up to major whole farm advantages.

Table 11 shows the characteristics of large crop farms that earned the highest profit vs. the low profit farms in 2016. This year's data shows some surprising differences. For example, the low income farms had much higher soybean yields than the high income group. The low income farms also reported higher sales prices for both corn and soybeans. These differences suggest that there are regional effects contributing to the profitability of these farms in

2016. It is very likely that the high income groups includes more farms from Northwestern Minnesota, where rental rates are lower and the price basis is wider.

Some characteristics have held in each of the past four years. Based on asset turnover rates, the low income group is not over-invested, at least not more than their high income neighbors. The big difference has been in the operating profit margin. The high profit farms appear to have controlled costs across the board more effectively than the low profit group. As we have seen before, a small cost savings across the board makes a big difference in operations of this size.

Just because a farm is in the low profit group this year does not mean that they will struggle next year. But in general, these low profit farms face much higher financial risks at this time.

Crop Farms with Greater Than \$1,000,000 Gross Sales	Low Income Farms	High Income Farms
Gross sales	\$1,783,000	\$2,285,000
Median net farm income	-142,000	480,000
Debt to assets	54%	40%
Current ratio	1.2:1	2.1:1
Working capital to gross revenue	13%	50%
Term debt coverage (accrual)	-0.07:1	2.22:1
Asset turnover rate	35%	33%
Operating profit margin	-8%	19%
Age of principal operator	52	49
Total crop acres	2,511	3,853
Percent crop acres owned	17%	27%
Corn yield	200	203
Soybean yield	59	52
Corn price	\$3.49	\$3.24
Soybean price	\$9.12	\$8.94
Machinery investment per acre	\$678	\$515

Table 11: High Income vs Low Income Large Minnesota Crop Farms, 2016

Family Expenses

For the third consecutive year, family living expenses declined for Minnesota producers who tracked detailed living expenses. Prior to the past three years, inflation adjusted family living expenses had increased for fourteen consecutive years. Approximately one-quarter of the families included in the Minnesota FINBIN database keep detailed family living records in addition to their farm financial records. The average of these farms spent \$59,000 on family living expenses in 2016 (Figure 15), a decrease of 3.5% from 2015 in real dollars.

Medical care and health insurance, when added together, were the highest single expenditure at \$10,154. Interestingly, that total was virtually unchanged from 2015.

Savings were spread across most areas of family expenditure. Food and meals expense was down 4%, gifts were down by 11% and education expense was down by 17%.

In addition to family living, the average family paid income and social security taxes of \$15,916 and another \$4,161 for household furnishing, non-farm vehicles, and other non-farm, non-real-estate capital purchases. In total, the average family needed to earn over \$79,000 from farm and nonfarm sources to cover family consumption and taxes, and thereby grow net worth.

Significantly, non-farm savings and investment decreased by 60%, likely a consequence of the cash flow restrictions farmers currently face.

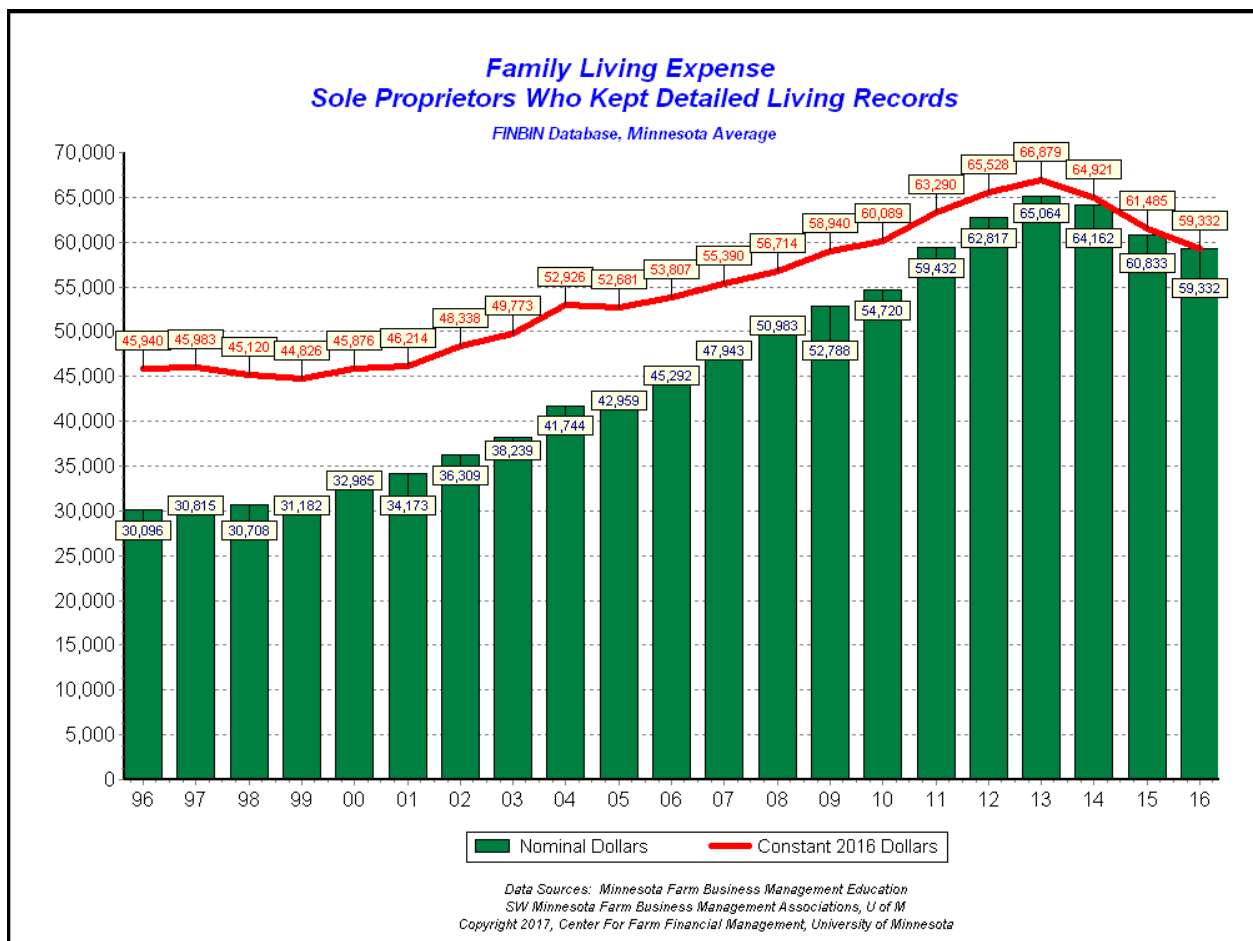


Figure 15: Family Living Expense

Data Sources

The Minnesota data included in FINBIN is provided by producers who are participants in farm business management education programs throughout the state. The majority of the farms included (2,091) are participants in the Farm Business Management Education programs offered through Minnesota State. More information is available on these programs at <http://www.fbm.mnscu.edu>.

Another 99 farms are members of the Southwest Minnesota Farm Business Management Association. More information is available on SWMFBMA at: <http://swroc.cfans.umn.edu/ag-programs/swmfbma>.

Sixty-two farms were contributed by other affiliated groups.

Sales Class	Total Minnesota Farms	Number of Farms in FINBIN	Percent in FINBIN
< \$100,000	48,100	231	0.5%
\$100,001 – \$250,000	8,600	411	5%
\$250,001 – \$500,000	6,200	548	9%
\$500,001 – \$1,000,000	5,100	560	11%
> \$1,000,000	5,300	502	9%

Table 12: Size of Farms included in FINBIN vs. Minnesota Farm Population

FINBIN data is not survey data. Participating producers complete a comprehensive financial analysis of their operation at the end of each year, with the help of a farm management educator. The farm financial data is processed through several levels of screening for accuracy and completeness. Every effort is made to verify the integrity of each set of farm financial data included in the database.

The FINBIN database includes a substantial share of Minnesota commercial farms. Table 12

compares the farms included in FINBIN to all Minnesota farms based on USDA/NASS data. Based on these figures, FINBIN includes 10% of Minnesota farms that grossed over \$250,000 and a lower percentage of smaller Minnesota farms. It must be stressed, however, that this is not a random sample of Minnesota farms. These farms choose to be involved in Farm Management programs and there may be characteristics of farms that participate in these educational programs that make them different from other farms in the state.

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