Pork Production in Nebraska: The Ability to Make a Living

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Introduction

The size of pork production units in the United States has changed dramatically in the past 20 years. In Nebraska that change is demonstrated by the fact that in 1989, 61 percent of Nebraska's inventory of hogs was owned by producers who marketed less than 1,000 hogs per year, and by 2002, only 23 percent of the inventory was held by producers in that category.

While many reasons for this change have been offered, one is that producers were not able to generate an acceptable family living. They either expanded their operations to compensate or they left the business. This hypothesis is examined in this publication.

Methods

Family Living

To determine an acceptable family living, the household expense data in the Nebraska Farm Business Association (NFBA) annual report are used. The data are derived from the reports of diversified farmers across Nebraska. The data are compared to nonfarm household income in Grand Island, Neb. to determine if reported farm family living differs from that of nonfarm households.

Family living, as reported by NFBA, is then compared to the cash that is available to the operator, after expenses, from a 125-sow farrow-to-finish operation. The data for the swine operations are from the Swine Enterprise Records and Analysis Program. This comparison allows examination of whether the produces could generate an average family living.

If providing a family living is a significant driving factor in the growth of swine operations, the size categories that are large enough to provide family living should be the ones that grow significantly. The number of swine units in each size category reported by USDA in the December Hogs and Pigs Report is used examine the size of operations that are growing in the United States.

Data Sets

To examine this hypothesis, data from the Nebraska Swine Enterprise Records and Analysis Program (NSER&A), the Nebraska Farm Business Association (NFBA), and *Positioning Your Pork Operation for the 21st Century* (PYPO) published by Purdue University were used to analyze a producer's ability to generate a living. Living cost comparisons were also made between the NFBA and United States Census data for nonfarm income levels in Grand Island, Neb., to ensure that NFBA farm incomes adequately represented family living needs. Also, because the data have differing origins, adjustments were made to allow comparison.

Since the Purdue data (PYPO) were estimated in a different region, actual Nebraska feed prices and market hog prices for the compared years were used. Labor costs were adjusted from 1994 to 2002 by using Nebraska wage data for this period. The percentage of increase in labor costs for each year was added to the 1994 Purdue budget.

NSER&A data ended in 1997. Data for 1998 through 2002 were calculated using actual feed cost changes and a weighted annual increase in nonfeed costs. After 1997, productivity was increased at the average rate (3.5 percent) of improvement reported by all producers from 1988 to 1997.

NSER&A data included information on three categories of producers: high profit 1/3, low profit 1/3, and average of all producers. Data for the average of all producers are used in comparison.

Hog market prices are cyclical. The cycles that run between an extreme high and an extreme low last from three to four years. Comparisons were made between entire cycles rather than specific years.

The data sets have certain labor costs, which include funds that could be earnings to the owner / operator in a family business situation. The unpaid labor costs in NSER&A data were added back when comparing earning potential to living needs. In the Purdue data, a $1.39/cwt management fee was added back.
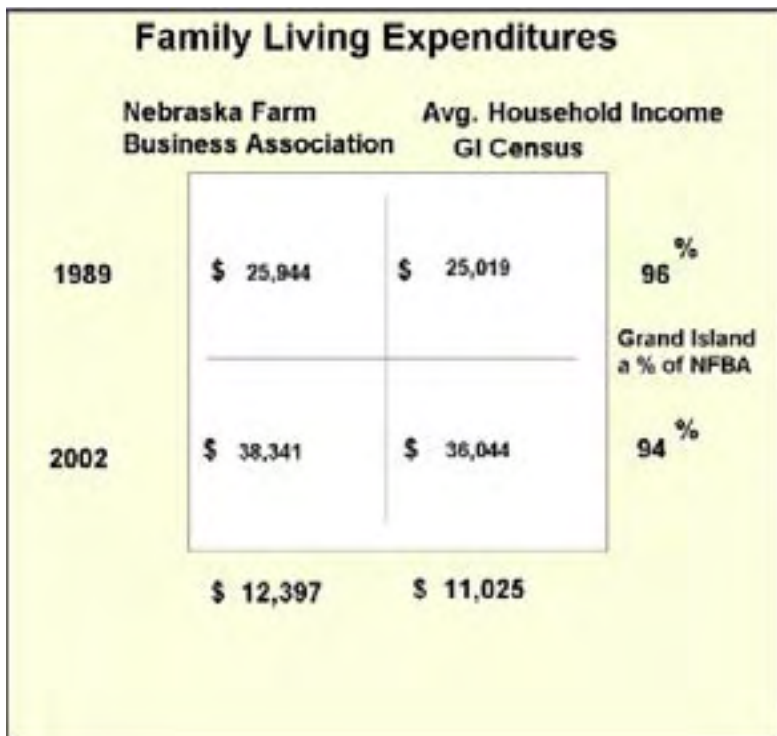
Figure 1. Family living expenditures.

In the NSER&A data, interest costs are the actual reported values (10 percent to 12 percent) for the years compared. In general, interest costs went down over this period. Interest costs in the Purdue example are opportunity costs calculated by an expected rate of return on investment. Interest costs or opportunity costs are left at original values and are added back as if these were debt free operations.

It is likely that living expenditures are variable in different regions of the U.S. To adjust the Purdue example, the same family living expenditures are used as were indicated for Nebraska producers by the Nebraska Farm Business Association.

Producers have improved productivity and lowered costs in pork production systems. Producers reporting to the NSER&A program increased weaned pig productivity 23.6 percent during the 10-year reporting period. For average producers participating in the NSER&A program from 1988 to 1997, the number of pigs sold per sow per year increased from 12.95 to 16.7. This study looks at a static breeding herd

of 125 sows (the average herd size for the NSER&A participants) from 1990 to 2002. From 1990 to 1997, actual producer numbers are used. From 1998 to 2002, yearly figures are calculated using average productivity gains that the NSER&A participants had been achieving, actual corn and soybean meal prices and an average change in nonfeed costs.

Discussion and Results

Living Costs

Living costs have increased for farm families. Using 1989 as a base, the Nebraska Farm Business Association average family living cost was $25,944 before taxes. By 2002, it had risen to $38,341, an increase of 48 percent. As a comparison to nonfarm families, median household income in Grand Island, Neb., was $25,019 in 1989. By 2002 that figure was $36,044, an increase of 44 percent. The data suggest the living expenditures and their increases are comparable (*Figure 1*) for farm and nonfarm families across Nebraska and that the NFBA annual living expenditures used in this paper are valid.

Hog Price Cycles

Hogs prices are cyclical. Cycle lows are found in 2002, 1998 and 1994 (four-year cycles), and again in 1991, 1988 and 1985, (three-year cycles) (*Figure 2*). Comparing the ability of producers to generate a living through an entire cycle reduces the single-year effect and helps determine producers' ability to generate a living over time.

Ability to Generate Family Living Expenditures

The NSER&A indicated the average 125-sow farrow-to-finish producer could have generated 221 percent of living needs in the first cycle from 1989 to 1991. During the fourth

Figure 2. Hog price cycles.

Dollars Available and Nebraska Farm Business Association reported family living expenditures compared.

Year	Producer Ranking	NSER&A Records								Total Available Dollars	NFBA Annual Living	% of NFBA Annual Living	Average Ability Living for Cycle
		Production Cost	Sales Price	Sales Weight	Number Sold	Profit per/cwt	Unpaid Labor per/cwt	Interest Charges per/cwt	Dollars Available per/cwt				
First Cycle													
1989	Average	$41.23	$44.98	237	1618	$3.75	$3.12	$3.91	$10.78	$41,350	$25,944	159%	
1990	Average	$42.20	$55.67	239	1682	$13.47	$3.06	$4.12	$20.65	$83,034	$28,118	295%	221%
1991	Average	$43.21	$49.98	239	1604	$6.77	$4.03	$4.27	$15.07	$57,775	$27,924	207%	
Second Cycle													
1992	Average	$42.37	$43.24	243	1779	$0.87	$3.68	$4.02	$8.57	$37,041	$28,118	132%	
1993	Average	$44.02	$46.45	244	1761	$2.43	$3.47	$4.25	$10.15	$43,641	$31,887	137%	115%
1994	Average	$42.20	$40.69	246	1796	-$1.51	$3.53	$3.83	$5.85	$25,841	$33,650	77%	
Third Cycle													
1995	Average	$40.02	$42.88	244	2084	$2.86	$3.07	$4.18	$10.11	$51,388	$31,704	162%	
1996	Average	$50.71	$54.43	244	2193	$3.72	$2.44	$4.54	$10.70	$57,263	$30,943	185%	163%
1997	Average	$44.90	$52.27	252	2088	$7.37	$2.76	$4.68	$14.81	$77,923	$33,534	232%	
1998	Average	$38.00	$35.38	252	2160	-$2.62	$2.75	$4.69	$4.82	$26,223	$36,343	72%	
Fourth Cycle													
1999	Average	$37.47	$34.26	256	2235	-$3.21	$2.74	$4.69	$4.22	$24,132	$36,040	67%	
2000	Average	$37.14	$44.94	261	2312	$7.80	$2.73	$4.70	$15.23	$91,913	$38,377	239%	170%
2001	Average	$37.58	$46.55	265	2392	$8.97	$2.72	$4.71	$16.40	$103,966	$33,749	308%	
2002	Average	$40.43	$36.61	265	2475	-$3.82	$2.71	$4.71	$3.60	$23,607	$36,764	64%	

Figure 3

Figure 3. Dollars available and Nebraska Farm Business Association reported family living expenditures compared.

cycle, 1999 to 2002, that producer would have generated 170 percent of family living cost (*Figure 3*). Compared across cycles, there is a drop in available revenues, but producers could still generate more than needed for family living.

A producer with 125 sows could have consistently generated more than living cost during each cycle over the 14 years included in the four cycles (*Figure 4*). The trend line indicates that the amount generated over living costs decreased over the four cycles. These producers would have had four years out of the 14 years shown when family living expenditures would not have been covered. Single year events do not appear to have a high impact on the decision to exit pork production. The long-term trend in the number of hog producers in Nebraska does not show unusual exits around price lows.

Producers would have been able to keep up with living cost without the magnitude of growth in production unit sizes that has occurred. However, producers would have had to make some increases in size if they wanted to maintain the same total dollars available in cycle four as they enjoyed 10 years earlier in cycle one.

From 1989 to 2002, average producers would have had to double their operation's size to maintain the level of total dollars available shown in cycle one. They would have needed approximately 250 sows and marketings of approximately
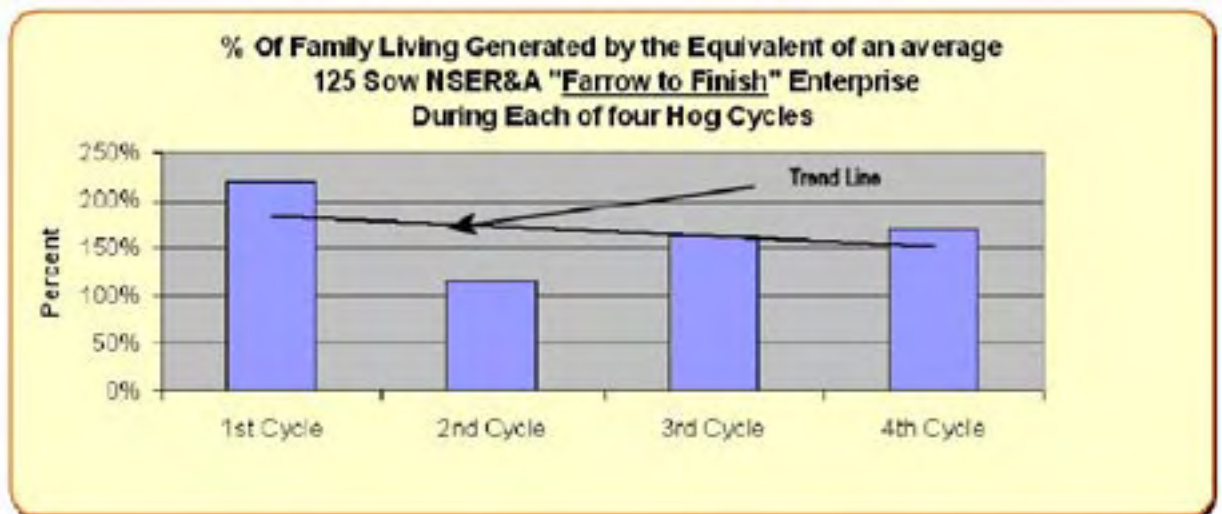

Figure 4. Percentage of family living geneated by the equivalent of an average 125-sow farrow-to-finish enterprise during four cycles.

Increase in Sow number needed to Match First Cycle performance Average producers												
1999	Average	$37.47	$34.26	256	2235	-$3.21	$2.74	$4.69	$4.22	$24,132	$36,040	67%	
2000	Average	$37.14	$44.94	261	2312	$7.80	$2.73	$4.70	$15.23	$91,913	$38,377	239%	170%
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Number of sows	125	Number Needed	Number sold		1st Cycle equivalent			% of Living	Av % of Living	1st Cycle equivalent	Increase Needed
1999 Average	413	7,376	2235	$4.22	$79,648	$24,132	$36,040	67%			
2000 Average	115	2,134	2312	$15.23	$84,813	$91,913	$38,377	239%	170%	221%	1.30
2001 Average	90	1,716	2392	$16.40	$74,585	$103,966	$33,749	308%			
2002 Average	440	8,518	2475	$3.60	$81,248	$23,607	$36,764	64%			

Figure 5

Figure 5. Increase in sow number needed to match first cycle performance average producers.

4,900 hogs (*Figure 5*). This would have required a one time inventory of 2,700 to 2,800 head, assuming two market groups per year and breeding stock. Some producers clearly did that. But the size category "1,000-1,999" dropped and "2,000-4,999" remained the same instead of growing as one might have expected. The category of "over 5,000 head" is the only one that grew during this period (*Figure 6*).[1] With two market groups per year, this category would market in the range of 10,000 or more hogs per year. This is twice what would be needed to maintain first cycle available dollars.

Purdue Model of Larger Operations

Published in 1995, a Purdue study used a model of a 1,200-sow farrow-to-finish unit as a benchmark. The study showed with new construction, a paid labor force, and an added cost for overall management, that the total production cost was $34.25 per cwt. This model used 1994 as the base year, therefore years (1994 and 2002) of cycle lows were

[1] USDA Hogs and Pigs Report

compared. The data were adjusted by using Nebraska's feed cost and market hog prices for 1994 and 2002. The interest charges are shown in the Purdue model as an opportunity cost. The labor cost in this model is all hired, and there is a management fee above required labor of $1.39 per cwt. This management fee and the opportunity costs are included as available dollars. Between 1994 and 2002, the living cost was raised by the same percentage increase as used in *Figure 3*. Operations with these levels of production and the modeled costs could have made profits in all years, providing the owner operator in excess of the family living expenditures shown (*Figure 7*). Larger units were not driven by keeping up with living expenses.

If pork producers were unable to maintain living cost, pork production would be expected to decrease overall. This has not happened. Producers' ability to profit and reinvest are important drivers of increased size. Those producers increased the size of their operations, as long as profits from hogs were available and not used as a source of funds to invest in other enterprises.

Figure 6. Change in producer number by size category.

The 1980s were a pivotal period in pork production. Producer efficiencies along with improved housing and genetics weakened the traditional relationship between the number of sows used and the amount of pork provided to consumers (*Figure 8*).The changing of this relationship may have influenced the length of the hog cycle by reducing the impact of producers leaving the industry. Reduction in sow numbers did not reduce total pork supply as it had in the past. Less reduction in supply would slow the expected live hog price recovery. Slower price recovery would reduce the incentive to remain in or resume pork production. Those who remained in production and made capital investments would be more likely to use facilities to capacity as long as variable costs were paid. These changes may have affected producers' decisions. For producers having left the industry, there would be less to encourage them to
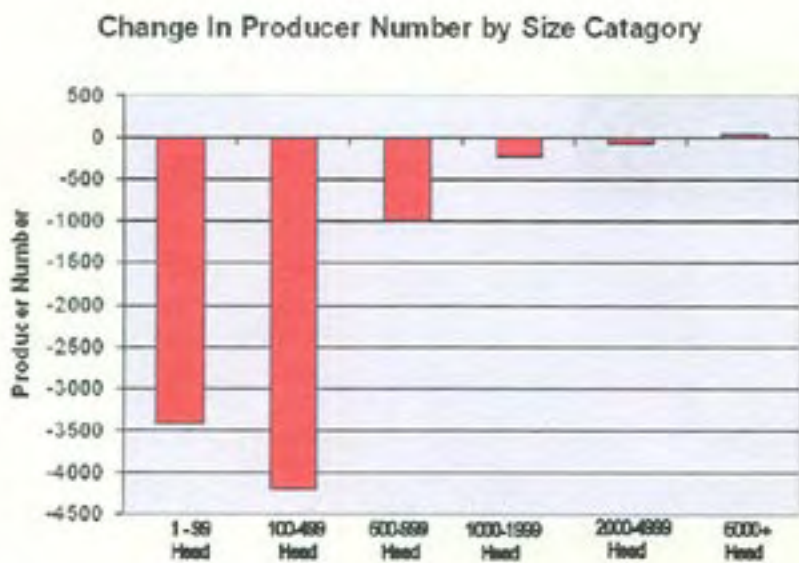
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Gain weight only, no production improvement Purdue Data Updated to 2002 Feed and Employment Cost Family Living also Increased by .0925

2002	1412	$34.96	$36.61	268	28053	$1.65	1.39	2.41	$5.45	$421,427	$113,532	371%

Figure 7. Purdue data for swine operations modeled in the 1994.

make the capital and time commitment needed to re-enter pork production.

Conclusion

Data indicates that the growth in the size of production units has exceeded that necessary to generate an adequate family living or maintain traditional margins for a diversified operation. There are other forces driving the growth in the operations producing pork.

The changes in the pork industry are more complex than many explanations would suggest. Risk and investment returns no longer favor diversity the same way they did in the past.[2] Those who are more dependent on their pork production enterprise have had to concentrate more on their business efficiency and marketing. These changes have increased the need to run the pork production enterprise to exacting standards.

Producers have had to develop additional skills to manage the changing production systems in their businesses. Production ability, that process of getting maximum production with minimum cost, is absolutely critical to being in the business. The changing production systems require additional responsibilities. Being a good employer, complying with a myriad of regulations, providing risk management in critical areas, all while completing day-to-day tasks, is a truly challenging undertaking. To do so in a diversified operation is even more challenging for the family operator.

[2] Borts, Laura; May, Gary J.; Lawrence, John D. *Factors Influencing Diversified vs. Specialized Swine and Grain Enterprises in Iowa*, Paper at 2004 Triennial Conference, Lexington, KY.

Acknowledgment: The chart for *Figure 2* of this publication was provided by AgWeb.com.
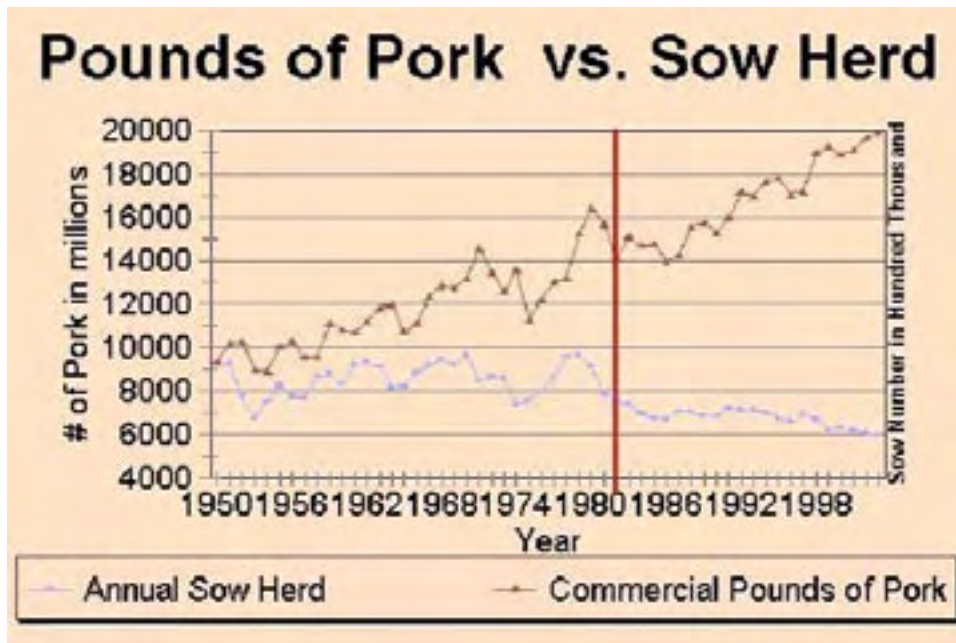

Figure 8. USDA data.