The Economic Contribution of Niman Ranch Hog Production in Iowa

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Introduction

Iowa is the nation's leading pork producer. In 2019, its farmers marketed 54.73 million hogs at a value of $7.7 billion, according to the National Agricultural Statistics Service of the USDA. Hog sales in Iowa accounted for 57.3 percent of all livestock product marketing in 2019, and 31 percent of cash marketing receipts for all agricultural products in Iowa (Table SAINC45 Farm Income and Expenses, Iowa 2019, Bureau of Economic Analysis).

Despite its importance to the agricultural sector, there are comparatively few hog farmers in Iowa. According to the 2017 Census of Agriculture, there were 6,221 producers, down 6 percent from the 2012 census. Hog farmers represent just 7.2 percent of all Iowa farms. Production concentration within the hog producing sector is quite pronounced: 41.3% of Iowa's hog farms sold 5,000 animals or more in 2017, and they accounted for 90.7% of all hogs sold and 88.4% of all sales (Figure 1).

This analysis compares Iowa overall hog production, as represented overwhelmingly by the production values found in Figure 1 with production characteristics of Niman Ranch's 195 hog farmers in Iowa.** The results of the analysis will show the overall economic contribution of the Niman Ranch farmers to the Iowa economy using an input-output modeling system that has been modified to reflect the Iowa swine production economy overall, and separately, another model to reflect the production characteristics of Niman Ranch operators.

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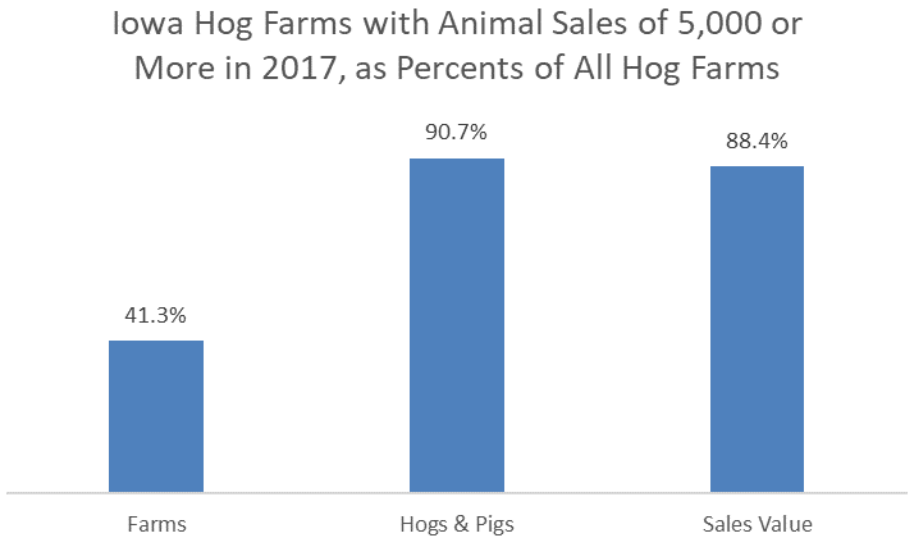
** Niman Ranch is a diversified group of agricultural producers nationwide, for more information see https://www.nimanranch.com/about-niman-ranch/

This research will provide two standardized economic contribution comparisons between conventional hog production in Iowa and the Niman Ranch farms: per 100,000 hogs marketed and per $1 million in hog sales. Lastly, the statewide economic contribution of Niman Ranch farms is revealed.

Figure 1



Model Modifications and Key Assumptions

This analysis utilizes the IMPLAN, Inc., modeling system.* Annual state and county data sets are purchased from the firm for use in input-output (IO) analysis. Data for 2019, the latest available, were used to construct the state level models used for this assessment.

For analyzing conventional pork production in Iowa, that ag sector was set to have $7.77 billion in hog producer output, which was the value of market sales described above. Total hog production jobs were set at 36,592, where the jobholders are both the farm operators plus all hired help. Labor income for all jobholders was set at that sector's model average for 2019. As

* IMPLAN, Inc., began as a research effort by the U.S. Forest Service before being developed as a private firm known as the Minnesota Implan Group in the early 1980s, which was subsequently sold to become IMPLAN, Inc. It is the most widely used input-output modeling system in the U.S. Iowa State University has maintained current IMPLAN data sets since the mid-1980s. For more information about IMPLAN and input output modeling systems: https://blog.implan.com/what-is-implan

a note, a job in the modeling system is not a full time equivalent; it reflects all persons who contribute labor on the farm to pork production both part-time and full-time.

The remaining characteristics of that sector were left untouched. That means that all of conventional pork production requirements assumptions from in-state suppliers of inputs and services were used in estimating that sector's performance in the Iowa economy.

A separate IO model of the Iowa economy was compiled for the Niman Ranch pork producers. Niman Ranch provided a detailed cost of production enterprise budget that allowed greater specification of the feed and other inputs required to produce Niman Ranch hogs. In addition, Niman Ranch provided the total number of hogs sold by its Iowa producers and the average price received for 2019, so that model's output on a standardized (per hog) basis was considerably higher than for conventional hog producers. The estimated carcass price for conventional producers was $67.61 cwt; the Niman Ranch average 2019 price was $97.93 cwt.

Total labor required for traditional pork production was set at the model default of 67 per 100,000 animals marketed. Niman Ranch estimated that its average total labor per marketed hog was two hours considering farrow to finish; that translated into an estimated 206 jobs per 100,000 animals marketed. Accordingly the Niman Ranch model was set so that it had much higher labor needs and labor income requirements per unit of sales than was the case with conventional producers.[*]

Understanding Input-Output Terminology

It is instructive at the outset to define the elements of IO model results so that readers understand exactly what is being conveyed.

The tables that will follow will have four economic categories:

[*] The conventional Iowa hog producing model had $7.77 billion in sales reflecting 54.7 million animals marketed. This analysis assumed that nearly 36,600 jobs were required to produce those sales. 36,600 jobs divided by 54.7 million marketed hogs times 100,000 equals 67 jobs per 100,000 sold animals. For this analysis, Niman Ranch labor per hog produced was set at three times conventional job requirements. While we know how many Niman Ranch hog producers there are in Iowa, there is no standardized estimate of the number of jobholders involved in hog production beyond the count of those farm operators. Setting that value at 206 should be viewed as a conservative estimate of Niman Ranch jobs.

- **Industrial output** is the value of production for a calendar year. In this analysis, that is the value of hogs marketed in 2019.
- **Value added** is the sum of labor income, returns to proprietorships, all payments to investors, plus indirect tax payments that are linked to production, like sales, property, and excise taxes. Value added is the equivalent of gross domestic product (GDP), which is the standard measure of economic value produced in states and the nation on an annual basis.
- **Labor income** is a component of value added and is composed of the wages and salaries paid to all jobholders in a sector plus the value of employer-provided benefits like contributions to social insurance, health, and retirement. Labor income also includes the salaries that proprietors pay themselves for managing their businesses.
- **Jobs** are all full and part-time positions in the economy. As many people have more than one job there are always more jobs in an economy than employed persons. IO models do not report jobs as full-time equivalencies (FTEs).

There are also four levels of economic activity reported out by IO models:

- **Direct activity** refers to the sector or sectors that are being scrutinized. Here we are looking at pork production.
- **Indirect activity** considers all of the in-state supplied inputs required for production. All businesses need supplies, services, utilities, financing and capital goods. The IO model estimates how many of these needs are supplied by Iowa firms.
- **Induced activity** occurs when the direct and the indirect sectors jobholders convert their labor income into household purchases. Induced activity is sometimes called the household level.
- **Total economic activity** is the sum of the direct, indirect, and induced activity.

This study uses the term “economic contribution” instead of “economic impact” when describing the contrasting scenarios. While the term economic impact is very liberally used by business interests and economic developers, it is generally reserved among economists to describe sales that go to final demanders like export sales (i.e., out of state) or to households.

The vast majority of pork produced in Iowa is processed by Iowa food manufacturers, who in turn make substantial export sales to buyers outside of Iowa. Economic contribution, however, uses the IO model's analytic capacity to describe the full value of linkages pork production has with the Iowa economy irrespective of the where its direct sales end up.

The Economic Contribution of Niman Ranch Hog Production in Iowa

The following tables compare the economic outcomes of Niman Ranch hog production with conventional production on a per 100,000 marketed hogs basis and per $1 million in direct sales, respectively.

Per 100,000 Hogs Marketed

Table 1 reports the comparisons per 100,000 marketed hogs. First, for conventional Iowa hog production, those sales would have yielded $14.2 million in output requiring 67 jobholders making $3.43 million in labor income. Those farms needed $6.18 million in Iowa-supplied inputs, to produce which took 23.1 jobholders making $1.38 million in labor income. When the direct sector and the indirect sector jobholders converted their incomes into household spending in the state, they induced $3.52 million in output that paid $1.05 million in labor income to 24.8 jobholders. Summed, conventional producers of 100,000 marketed hogs generated $23.90 million in total output and $11.77 million in value added, of which $5.86 million was labor income to nearly 115 total jobholders.

Table 1

Conventional Iowa Hog Production Per 100,000 Marketed Animals

	Jobs	Labor Income	Value Added	Output
Direct	67.0	$3,431,707	$7,494,782	$14,197,903
Indirect	23.1	$1,380,993	$2,310,980	$6,182,261
Induced	24.8	$1,051,350	$1,968,456	$3,518,748
Total	114.9	$5,864,049	$11,774,217	$23,898,912

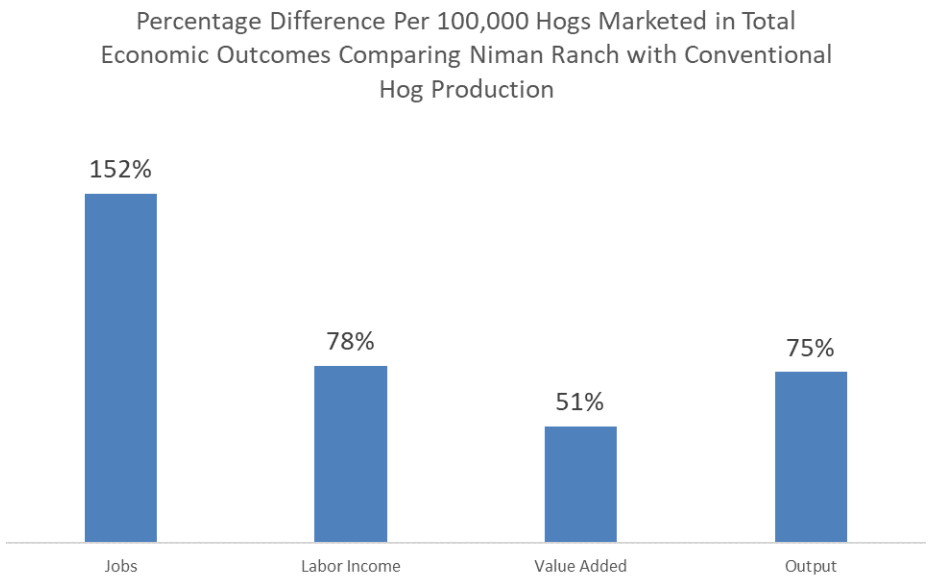
Niman Ranch Iowa Hog Production Per 100,000 Marketed Animals

	Jobs	Labor Income	Value Added	Output
Direct	206.0	$5,990,326	$9,891,741	$20,565,300
Indirect	40.2	$2,555,711	$4,381,854	$14,924,968
Induced	43.9	$1,863,478	$3,491,007	$6,240,029
Total	290.1	$10,409,515	$17,764,603	$41,730,297

Niman Ranch economic contributions per 100,000 hogs are significantly higher than was the case for conventional producers. They generated $20.57 million in 2019 sales, requiring 206 jobholders making $5.99 million in labor income. They required $14.92 million in state-supplied inputs, which in turn needed 40.2 jobholders making $2.56 million in labor income to provide. When the direct and indirect jobholders converted their paychecks into household purchases, they induced $6.24 million in additional output supporting $1.86 million in labor income to 43.9 workers. Summed, Niman Ranch producers of 100,000 marketed hogs generated a total of $41.73 million in output and $17.76 million in value added, of which $10.41 million was labor income to 290.1 jobholders.

The economic outcome differences per 100,000 marketed hogs are displayed in Figure 2. The total job effects are by far the strongest at 152 percent greater. It is clear, however, that when measured on a per animal basis, Niman Ranch hog production has much greater local and state economy linkages and total effects across all categories.

Figure 2



There is a substantial difference in the indirect activity between the two sets of producers. The conventional hog production model used the IO model default values to estimate the likelihood of in-state production requirements. The Niman Ranch scenario was informed by actual input requirements that were used to manually alter the default production values for in-state purchase amounts for major inputs. That manual adjustment to the model clearly boosted the indirect multiplier effect substantially for the Niman results. Induced values were also boosted as there were both higher direct and indirect job and labor income amounts.

Per $1 Million in Direct Sales

The data in Table 1 can be converted to reflect detailed multipliers per $1 million in direct sales. This is the standard manner in which IO multipliers are expressed in the modeling systems. The results are displayed in Table 2

Table 2

Conventional Iowa Hog Production Per $1 Million in Direct Output

	Jobs	Labor Income	Value Added	Output
Direct	4.7	$ 241,705	$ 527,880	$ 1,000,000
Indirect	1.6	$ 97,267	$ 162,769	$ 435,435
Induced	1.7	$ 74,050	$ 138,644	$ 247,836
Total	8.1	$ 413,022	$ 829,293	$ 1,683,271

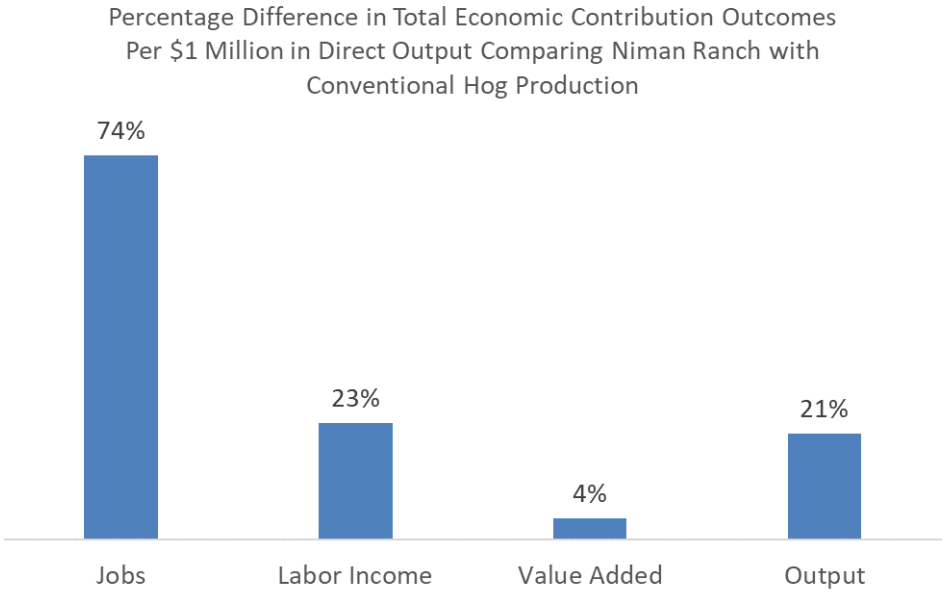
Niman Ranch Iowa Hog Production Per $1 Million in Direct Output

	Jobs	Labor Income	Value Added	Output
Direct	10.0	$ 291,283	$ 480,992	$ 1,000,000
Indirect	2.0	$ 124,273	$ 213,070	$ 725,735
Induced	2.1	$ 90,613	$ 169,752	$ 303,425
Total	14.1	$ 506,169	$ 863,814	$ 2,029,161

Each economic category and economic level in the table has value, but for our purposes, the total line conveys what is called the total requirements results of the modeling exercise, where the total requirements results reflect the multiplied through consequences of the modeling process per standard unit of output. For each $1 million in direct conventional hog output, $1.68 million in total economic activity is supported in the Iowa economy, $.829 million in value added, $.413 million in labor income, and 8.1 total jobs.

For Niman Ranch, each million in direct output supported $2.03 million in total output in Iowa, $.864 million in value added, $.506 million in labor income and 14.1 jobs. The percentage difference of Niman Ranch total results compared to conventional hog production are displayed in Figure 1.

Figure 3



The results of this graph vary widely by economic category, but interpretation is straightforward when considered on a per $1 million in direct sales basis: labor consequences (i.e., rural employment) are substantially greater, returns to labor income are also substantially higher because there are more farmer labor participants than would be the case with conventional production. Value added is only slightly higher mostly because there was a shift away from making profits payments to investors, who may or may not be Iowa residents, towards paying profits to Niman Farm owners, all of whom are Iowa residents. Finally, output is higher because Niman Ranch hogs require more locally supplied inputs per $1 million in sales and the higher labor incomes induce more household spending.

Readers will notice that the per-100,000 hogs produced differences in Figure 2 were more pronounced than the per-$1 million in direct output results above. Both are legitimate indexes of the value of Niman Ranch to the state's economy, and either can be used when describing the Niman Ranch production values to the state. It depends on the points to be made. If hog production and hog numbers are the focus, then Figure 2 and Table 1 provide useful metrics; if the value of hog production is the focus, then Figure 3 and Table 2 are the appropriate measures.

Niman Ranch Economic Contribution in 2019

There were 195 Niman Ranch Iowa hog producers in 2019. They marketed 116,943 hogs at an average price of $97.93 cwt. Table 3 shows their total economic contribution to the state of Iowa.

Their $24.05 million in output required the equivalent of 241 jobs earning $7.01 million in labor income. They caused another $17.45 million in indirect output by buying required supplies and services from in-state firms. Those purchases supported another 47 workers making $2.99 million in labor income. When the workers at the Niman Ranches and the supplying sectors converted their labor income into household spending they induced another $7.3 million in output supporting 51.3 job holders and $2.18 million in pay to those workers. Summed, Iowa's 195 Niman Ranch farms caused $48.8 million in total output and $20.77 million in value added, of which $12.17 million was labor income to 339.3 jobholders statewide.

Table 3

Niman Ranch Iowa Hog Production Economic Contribution, 2019

	Jobs	Labor Income	Value Added	Output
Direct	240.9	$ 7,005,267	$ 11,567,699	$ 24,049,679
Indirect	47.0	$ 2,988,725	$ 5,124,272	$ 17,453,705
Induced	51.3	$ 2,179,207	$ 4,082,488	$ 7,297,277
Total	339.3	$ 12,173,199	$ 20,774,460	$ 48,800,661

Conclusions and Cautions

Niman Ranch operations clearly have much stronger linkages to the state's economy than conventional hog production in that they require more labor per standardized unit of production or sales, have different supply requirements, shift portions of the profits from corporations to farmer-owners, and induce more household spending among all of the affected workers and farm owners.

This analysis compared Niman Ranch production characteristics to the default hog production characteristics in the IO model. That means that the modeling structure has built-in assumptions about the probability of necessary inputs being supplied by in-state firms. Utilizing Niman Ranch estimates of inputs substantially increased their percentage of purchases, for

example, from animal feed manufacturers, which in turn have robust linkages back to their in-state suppliers (grain and oilseed producers, pharmaceuticals, wet millers of corn, and oilseed processors, as examples).

Ideally, we match the Niman Farms hog producers with representative set of 195 conventional hog farmers that was weighted by their average production to fully understand actual conventional hog production costs and the likelihood that their inputs were Iowa-supplied. But the probability of that kind of study is near zero, so we relied on the IO model to best reflect that sector at the state level in this analysis.