Economic Impacts of Swine Production in Oklahoma

Chuck Willoughby, Bill Luce, Joseph E. Williams, and Mike Woods

Historically, Oklahoma's swine production industry has been a small but an important agricultural industry in the state. Prior to 1994, Oklahoma ranked 23rd to 25th among the states in terms of total hog numbers. The largest number of hogs and pigs on Oklahoma farms prior to the 1990's was 1,495,000 in 1942. Hog and pig numbers decreased to a low of 190,000 in 1991 and then started increasing. The USDA's estimate of Oklahoma's hog and pig inventory on December 1, 1997 was 1,640,000. This increase in inventory reflects a 763 percent increase between December 1991 and December 1997. However the December 1997 level is only 10 percent greater than the 1942 reported inventory. Oklahoma has increased to the 8th largest state in terms of national ranking in swine production. Oklahoma has had a tremendous increase in hog production during the 1990's. A major factor was the passage of Senate Bill 518 enacted by the Oklahoma Legislature in April 1991. Senate Bill 518 removed some restrictions to corporate or contract hog farming in Oklahoma.

Although hog numbers are slightly higher than the 1942 levels the structure of the Oklahoma hog industry has changed. The structure of the Oklahoma industry is following a national trend. The number of farms reporting hog numbers is decreasing and the number of hogs produced on each farm is increasing. Between 1980 and 1997 the number of Oklahoma farms reporting hogs decreased from 8,000 to 2,800. The USDA reports that in 1997, 92.5 percent of the state's inventory was on farms having 2,000 or more head per farm. Large farms generally have greater production and economic efficiency than smaller farms. Production efficiencies are related to availability of improved genetics, pigs weaned per sow, litters per sow, feed efficiency, and specialized labor. Concentration of hog numbers, however, creates concerns related to odor and waste management, what many would label a negative externality or societal cost.

Another aspect of Oklahoma's swine industry is a new state of the art swine slaughtering facility at Guymon. This facility purchases 60 percent of its slaughter hogs from Oklahoma. By 1998, the goal of the Guymon facility is to slaughter 4 million head per year using 2 shifts of employees.

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Current Farm Economics 3
It is the purpose of this report to identify the economic impact of Oklahoma's swine-pork industry. Specifically, this report will:

1. Review historical trends of Oklahoma's swine industry;
2. Summarize the direct economic activities of the swine industry;
3. Estimate the secondary and total effects the swine industry has on Oklahoma's economy.

No policy recommendations will be made regarding the findings of this study. The intent is to provide the best possible information to community leaders, policy makers, and all Oklahomans regarding this component of Oklahoma's economy.

**Oklahoma Swine Production**

The number of hogs in the state has increased significantly over the past few years. By the end of 1997, hog inventories were over 1.6 million, the highest the state has seen since the 1930's and 1940's (see Appendix). From 1980 to 1996, the number of swine sold increased from 547,000 to 2,386,000 (an increase of 418%). During the same time period, the value of the swine sold increased from $44.2 million to $320.7 million (625%). Figure 1 and Table 1 demonstrate these trends. Concentration of hog production and marketing by county for the 1982, 1987, and 1992 Agricultural Census years are available in the Appendix.

While the number of hogs in the state has increased, the number of hog producing farms has decreased. Table 2 provides information on the

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**Figure 1. Oklahoma Swine Marketings & Value, 1980 to 1996.**
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<tbody>
<tr>
<td>Swine Sold (1,000 Head)</td>
<td>547</td>
<td>297</td>
<td>431</td>
<td>419</td>
<td>435</td>
<td>591</td>
<td>1,019</td>
<td>1,616</td>
<td>2,836</td>
</tr>
<tr>
<td>Swine Value ($1,000)</td>
<td>$44,238</td>
<td>$37,782</td>
<td>$57,325</td>
<td>$49,039</td>
<td>$44,673</td>
<td>$63,854</td>
<td>$98,720</td>
<td>$193,293</td>
<td>$320,714</td>
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Table 2. Change in the Number of Swine Farms from 1982 to 1997 by Size of Inventory

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<tbody>
<tr>
<td>1 to 99</td>
<td>3,820</td>
<td>3,086</td>
<td>2,600</td>
<td>-19.2%</td>
<td>-15.7%</td>
</tr>
<tr>
<td>100 to 199</td>
<td>384</td>
<td>288</td>
<td>90</td>
<td>-25.0%</td>
<td>-68.8%</td>
</tr>
<tr>
<td>1000 or more</td>
<td>21</td>
<td>41</td>
<td>110</td>
<td>95.2%</td>
<td>168.3%</td>
</tr>
<tr>
<td>Totals</td>
<td>4,225</td>
<td>3,415</td>
<td>2,800</td>
<td>-19.2%</td>
<td>-18.0%</td>
</tr>
</tbody>
</table>

number and size of hog producing farms for the 1982 and 1992 Agricultural Census years and 1997. From 1982 to 1992, hog farms decreased from 4,225 operations to 3,415 or by 19 percent. The size of farms producing has changed as well. Operations producing under 100 head have decreased by 19 percent while those producing 1,000 or more increased by 95 percent. More recent data shows that this trend is continuing. According to USDA estimates, the number of hog producing operations for 1997 is down to 2,800 (an 18% decrease from 1992). Those producing less than 100 head number 2,600 (a 16% decrease from 1992) while those producing over 1,000 head number 110 operations (a 168% increase over 1992). This change in the structure of the industry is due largely to an increased number of mega-type farms able to take advantage of the economies of size to produce hogs more efficiently. Figure 2 identifies Oklahoma’s thirteen major hog farms and their areas of operation.

Impact of Pork Production

Although the number of farms producing hogs in Oklahoma has decreased, total production has increased tremendously. To estimate the impact jobs and income in the pork production sector have on Oklahoma’s economy, an input-output model was constructed utilizing IMPLAN software. The model estimates three types of impacts that pork production have on the state economy – direct, indirect, and induced. The sum of these effects is the total economic impact.

The direct effect is described as the employment and income necessary for swine production. Indirect effects result from purchases of inputs by hog producers thus providing employment and income in those sectors (e.g., feed grains, etc.). Induced effects result from the income effect through purchases of goods and services by employees of the hog production sector and input suppliers. For more discussion on these effects and using the IMPLAN system, see the appendix or the reference cited.

Pork Production (Direct Impacts)

The direct effects of Oklahoma’s pork production industry to the state’s economy in 1997 are shown in Table 3 (line labeled “swine production”). This is the share of production sold to processors and consumers. A total of 3,660 jobs are required to support production activity. Employees and proprietors receive approximately $128.6 million in income from producing hogs in Oklahoma.

Supplying Industries (Indirect Impacts)

Various supplies and services (inputs) are needed by pork producers to raise swine. The largest of these inputs are agricultural services such
Swine Production Firms

1. Bar-D Swine
2. Cargill
3. Dominion Farms
4. DeKalb Swine Breeders, Inc.
5. Farmland Industries, Inc.
6. Hanor Inc.
7. Hitch Pork Producers
8. Land O'Lakes
9. Murphy Family Farms
10. PIG Improvement Company, Inc.
11. Seaboard Farms
12. Tysons Foods, Inc.
13. Vall Co.

Source: Luce and Williams, November 1997

Figure 2. Location of Major Swine Production Firms.
as feed suppliers. Farmers also purchase maintenance and repair services, insurance, transportation, utilities, etc. (see impact reports in the appendix). The payments received for the supplies generated an estimated 1,758 jobs and $27.7 million of income (Table 3). These jobs and income are dependent upon swine production and are in addition to the pork production jobs and income previously mentioned.

**Employee Expenditures (Induced Impacts)**

Employees of pork production enterprises and the supplying industries spend their income throughout their local economy. They purchase groceries and household items, furniture, automobiles, insurance, etc. They eat at local restaurants, attend movies, and give money to their churches and other charitable organizations. These expenditures generated an estimated 3,722 jobs and $82.8 million of income throughout the state in 1997 (Table 3).

**Economic Impact of Production (Total Impacts)**

The row labeled “Total Impact of Swine Production” of Table 3 reports the sum of the direct, indirect and induced effects. It is estimated that pork production in 1997 generated a total of 9,140 jobs and an estimated income of approximately $239.0 million.

<table>
<thead>
<tr>
<th>Swine Sector</th>
<th>Personal*</th>
<th>Employment*</th>
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<tbody>
<tr>
<td></td>
<td>(MM$)</td>
<td>(Jobs)</td>
</tr>
<tr>
<td>Swine Production</td>
<td>128.6</td>
<td>3,660</td>
</tr>
<tr>
<td>Supplying Industries</td>
<td>27.7</td>
<td>1,758</td>
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<tr>
<td>Employee Purchases</td>
<td>82.8</td>
<td>3,722</td>
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<tr>
<td><strong>Swine Production Total</strong></td>
<td><strong>239.1</strong></td>
<td><strong>9,140</strong></td>
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<tr>
<td>Swine Processing</td>
<td>121.6</td>
<td>3,220</td>
</tr>
<tr>
<td>Supplying Industries**</td>
<td>49.9</td>
<td>2,154</td>
</tr>
<tr>
<td>Employee Purchases**</td>
<td>90.7</td>
<td>4,028</td>
</tr>
<tr>
<td><strong>Swine Processing Total</strong></td>
<td><strong>262.2</strong></td>
<td><strong>9,402</strong></td>
</tr>
<tr>
<td><strong>Overall Swine Industry Total</strong></td>
<td><strong>501.3</strong></td>
<td><strong>18,542</strong></td>
</tr>
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</table>

Source: Computed using IMPLAN Professional 1.1.6.

* Includes Employees and Proprietors

** Excludes effects and backwards links of pork production
Impacts of Pork Processing

An industry closely linked to pork production and a significant part of the swine industry is pork processing. The 1995 County Business Patterns for Oklahoma reports that Oklahoma has 12 processing plants that produce sausage and other prepared meats employing approximately 1,400 people and 43 meat packing plants employing a little over 600 people. The new facility at Guymon reportedly employs 1,500 people. Using the IMPLAN software, impact analysis was conducted to determine the impacts pork processing has on Oklahoma’s economy. The backward link to Oklahoma’s pork producers as suppliers of inputs was removed from the model to avoid double counting of the pork production impact. These results are reported in Table 3 below the impacts reported for pork production.

Pork Processing (Direct Impacts)

The direct effects of Oklahoma’s pork processing industry to the state’s economy in 1997 is shown on the line labeled “swine processing.” A total of 3,220 jobs are provided in the processing activity. Employees and proprietors in this sector of the state’s economy receive an estimated income of $121.6 million.

Supplying Industries (Indirect Effects) & Employee Purchases (Induced Effects)

The purchase of various supplies and services (less those of Oklahoma pork producers) required by processors generate the dollars necessary to employ 2,154 people. Those employees and proprietors in turn earn an estimated income of $49.9 million. The expenditures of the these employees and proprietors for goods and services in the state’s economy generate an additional 4,028 jobs earning an estimated income of $90.7 million (Table 3).

Total Economic Impact

By summing the direct, indirect and induced impacts of the pork processing industry, it is estimated that pork processing contributes to the employment of 9,402 people earning an estimated income of $262.2 million. Add this to the previously reported impacts of swine production and the overall impacts of swine related industry in Oklahoma results in an estimated 18,542 jobs and $501.3 million of income (Table 3).

Summary

This report has summarized the trends in swine production for the state. Impacts to the economy, in terms of employment and income, have
been estimated. The swine production industry has backward linkages through input suppliers such as feed, transportation, etc. The industry also has forward linkages with slaughter and processing facilities. The overall impacts of the swine related industry are estimated to be 18,542 jobs and $501.3 million in income.

The industry faces several issues that are of concern or interest to Oklahomans including: Environmental – air and water quality; Rural Values – growth of larger farms versus smaller farms and possible implications; and Local Community Impacts – fiscal impacts of economic change, demand for services, and social change in the economy. These are complex issues that have no easy answer. The intent of this manuscript is to provide a benchmark for the economic activity of the swine industry.

References
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