January 2013

Economic Opportunities for Missouri with Swine Finishing Operations

UNIVERSITY OF MISSOURI
Extension
Commercial Agriculture Program

The Commercial Agriculture Program at the University of Missouri completed this report. This program is an interdisciplinary group of faculty in agricultural economics, agricultural engineering, animal science, plant science and veterinary medicine. Their mission is to create new opportunities for Missouri entrepreneurs and develop partnerships with firms that are both dedicated to profitable and sustainable agriculture and food systems.

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Economic Opportunities for Missouri with Swine Finishing Operations

Swine production has always been and continues to be an important economic activity in many regions of the state of Missouri. In the year 2011, Missouri had an estimated $979 million in cash farm receipts from the hog industry. Economic effects from these revenues flow into the local communities and stimulate rural economic development. While Missouri is one of the top ten states in swine production, a majority of feeder pigs are exported to other states for finishing production. This report will examine the current Missouri industry of exporting feeder pigs, the economics of a contract finishing unit and demonstrate the value created in Missouri if more feeder pigs were retained and finished in Missouri.

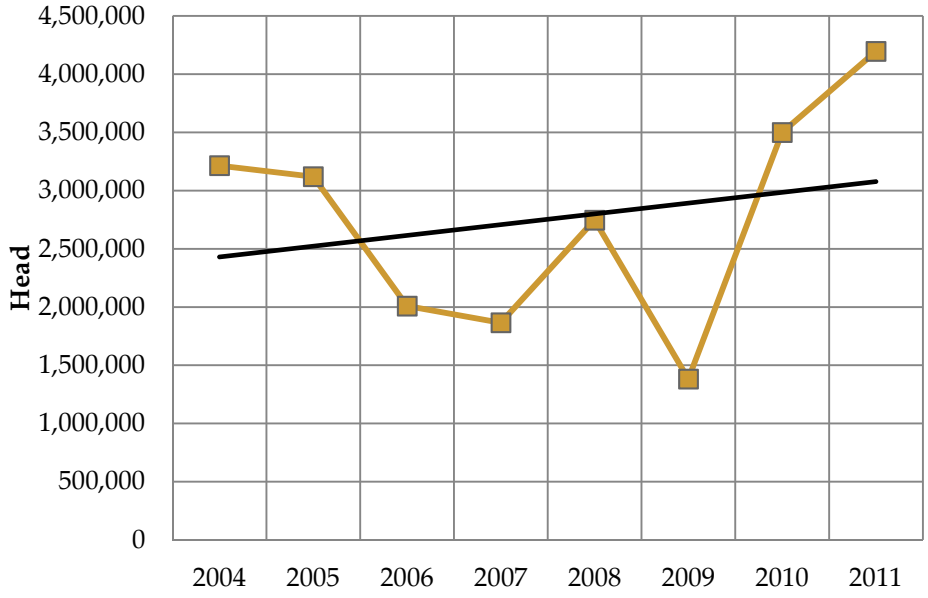
Background on Missouri's Industry

Missouri has always been a net pig exporter. Historically, Southern Missouri in particular was a very favorable place to operate sow enterprises in that production was outdoors, land and labor were relatively cheap and feeder pig production did not require a great deal of feed. This all changed as technology and new practices evolved which effectively moved production indoors and made climate and weather less relevant. Modern confinement facilities reduced labor requirements per sow which also diminished any competitive advantage of Southern Missouri.

In recent decades, however, the farms in Missouri that continued to produce pigs have made substantial capital investments to expand and achieve efficiencies and have adopted ever improving practices and genetics to create the state's modern and competitive weaner/feeder pig production sector. Over the same period, many farms in Missouri that had previously purchased many of these pigs, exited the industry.

The Missouri Department of Agriculture collects information concerning the number of feeder pigs that move to other states. Exhibit 1 illustrates an increasing trend of Missouri feeder pig exports over the past eight years. In 2011, Missouri exported over 4 million pigs, which is the highest level during this time period.

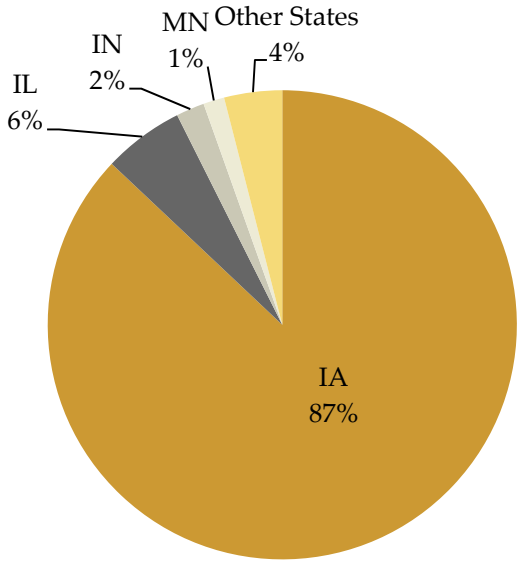
Exhibit 1 Missouri Feeder Pig Exports per Year



Source: Missouri Department of Agriculture

Currently Missouri is the seventh largest swine producer in the country. Iowa and Illinois, two bordering states, are ranked number one and number four respectively in swine production. These two states also receive over 90 percent of the feeder pigs exported from Missouri (see Exhibit 2). Missouri also sends a significant number of pigs to Indiana, Kansas, Minnesota and South Dakota. Swine production industries in importing states are impacted positively; farmers are directly impacted with revenue and the complementary industries to swine production, such as the feed mills and processing plants, experience increased business which stimulates state economic growth.

Exhibit 2 Missouri Feeder Pig Destinations, Percent of Total, Jan.-Aug. 2012



Source: Missouri Department of Agriculture

Economics of Swine Finishing Operations

Swine finishing operations (wean-to-finish or grow-to-finish) can provide various economic impacts to the individual producer, local community, region and state. Swine finishing production contracts have been used in Missouri as a way for producers to minimize risk and capital requirements which enables them to gain financing from lenders. In this situation, the integrator generally provides the pigs, transportation, feed and other services to the producer. The producer, or grower, is the individual who supplies the building, utilities, management and labor required to care for the pigs. To understand the potential economic benefits from swine finishing, we will analyze the economics of a 2,480 head contract grow-to-finish operation.

Developing a new operation can require various construction related activities that provide a one-time economic impact. Developing a new Missouri contract grow-to-finish operation in 2012 reflects a cost of approximately $240 per pig space. Construction cost estimates include all building requirements, dirt work, roads, water supply, electrical work, buildings, and land. A significant portion of these dollars will be spent locally for contractors, specialized labor, and building supplies for constructing the operation. While crop farmers entering into contract production are expected to have sufficient tractor power, additional manure handling equipment will cost approximately $55,000. The total direct economic impact for construction and capital investments for a 2,480 head grow-to-finish operation would be approximately $650,200.

Producers receive two forms of compensation for contract production: contract payments and fertilizer in the form of manure. Contract hog production payments are generally based on payment per pig space. Grow-to-finish contract rates in Missouri are currently close to $41 per pig space. For a 2,480 head grow-to-finish operation, this would result in a producer receiving a total of $101,680 on an annual basis.

2,480 head grow-to-finish operation

Income per year	
Contract payments =	$101,680
Value of manure =	$56,170
Total	$157,850

Manure provides an opportunity for producers to save in fertilizer costs for crop production. Based on using a deep pit for manure storage, manure nutrients from the grow-finish swine operation provide one year of nitrogen and two years of P and K fertilizer requirements for approximately 640 acres of cropland managed in a corn-soybean rotation (150 bu/acre corn and 45 bu/acre soybeans). Landowners would save approximately $174/acre over the two year crop rotation assuming fertilizer prices of $.49/lb N, $.61/lb P_2O_5 and $.50/lb K_2O. The fertilizer value in manure from a 2,480 head grow-to-finish operation would be approximately $56,170 per year.

Swine finishing operations will also provide annual indirect economic benefits to other businesses. The producer will use his income sources to pay for these additional services, which will further stimulate the economy. Services that may be needed by the operation include building/equipment repairs, utilities, professional fees, banking, insurance, supplies, custom manure hauling, and veterinary services. In the case of the 2,480 head contract grow-to-finish operation, no significant outside labor will be needed to take care of the pigs. All labor expenses will be compensated in the contract payment which the farmer receives.

Benefits from Increased Swine Finishing

Finishing more feeder pigs in Missouri would provide many new economic impacts to individual producers, the local community and the state's economy. An analysis using IMPLAN software was conducted to illustrate the economic effects from increased swine finishing in the state of Missouri. IMPLAN is an input-output model and includes economic data sets, multipliers, and demographic statistics for the entire U.S. economic infrastructure. It is a robust tool that can assess the effects of changes or industries and is widely used by economists and analysts.

The impacts from IMPLAN can be separated into three different categories: direct, indirect, and induced. A direct effect can be defined as the direct changes in an area as a result of a change in an industry. For example, the contract revenue and credit for manure fertilizer is a direct impact. An indirect effect would be when a producer purchases supplies or inputs from other industries (fuel, utilities, repairs, etc.). Induced effects are the changes in spending from income generated by direct and indirect impacts. For instance, the producer will use their income from their swine finishing operation to purchase homes, go shopping, doctor visits, and participate in local banking.

Economic impacts are categorized by various indicators such as output, jobs, value-added and labor income. Output reflects the total value of industry production. Another indicator is the number of jobs supported by the industry. Value-added refers to the difference between the industry output (value of production) and the cost of the inputs used in its production. This term can also be interpreted as the contribution to the state's gross domestic product. Labor or household income is another economic measure that is included in the value-added category. It reflects the total of employee compensation (wages and benefits) and proprietor income (self-employment).

In a hypothetical example, Missouri is estimated to retain and finish 100,000 feeder pigs per year. This would lead to the development of approximately 20 new 2,480 head grow-to-finish swine finishing operations, assuming each operation would have two turns of animals per year. The following impacts for construction and annual operations were developed using this example.

Construction Impact from 100,000 Feeder Pigs Retained and Finished in Missouri
A new Missouri 2,480 head contract grow-to-finish operation in 2012 reflects a projected cost of $650,200, which includes the building, dirt work, roads, water supply, electrical work, buildings, manure handling equipment, and land. These costs are the one-time direct economic impacts that will occur from developing this new operation.

For 100,000 feeder pigs retained and finished in Missouri, this would result in new direct investment of $13.1 million for the development of approximately 20 new operations. The total one-time economic impacts estimated to occur in the state of Missouri from the development of these new operations are illustrated in Exhibit 3. As a result of the construction of these new swine operations, it is estimated that approximately 180 jobs would be created, $8.3 million paid to labor, $11.9 million in value added, and $22.9 in industry output when considering all economic effects.

Exhibit 3 Construction Impact for 100,000 Feeder Pigs Retained and Finished in Missouri

Impact Type	Employment (jobs)	Labor Income (millions)	Value Added (millions)	Output (millions)
Direct Effect	100.4	$4.8	$6.0	$13.1
Indirect Effect	27.8	$1.5	$2.3	$4.0
Induced Effect	50.9	$2.0	$3.6	$5.8
Total Effect	**179.2**	**$8.3**	**$11.9**	**$22.9**

Note: May not sum due to rounding

Annual Operational Impact from 100,000 Feeder Pigs Retained and Finished in Missouri

Each year, a contract grow-to-finish operation is expected to generate value from their contract payments and manure. For the year 2012, a 2,480 head contract grow-finish operation is expected to generate $157,850, which would be the value of production (direct effect). For 100,000 feeder pigs retained and finished in Missouri, this would result in new total value of production of $3.2 million for operating approximately 20 new operations each year. The total annual economic impacts estimated to occur in the state of Missouri from the development of these new operations are illustrated in Exhibit 4. It is estimated that approximately 110 jobs would be sustained, $1.0 million paid to the labor force, $2.7 million in value added, and $5.1 in industry output when considering all economic effects from these new contract grow-to-finish operations.

Exhibit 4 Annual Impact of 100,000 Feeder Pigs Retained and Finished in Missouri

Impact Type	Employment (jobs)	Labor Income (millions)	Value Added (millions)	Output (millions)
Direct Effect	91.6	$0.4	$1.7	$3.2
Indirect Effect	12.4	$0.3	$0.6	$1.3
Induced Effect	6.1	$0.2	$0.4	$0.7
Total Effect	**110.1**	**$1.0**	**$2.7**	**$5.1**

Note: May not sum due to rounding

Tax revenues (also included in value-added classification) described in this section includes those paid to local, state, and federal entities. Tax impact values show the amount of revenue generated from employee compensation, proprietor income, indirect business taxes, households, and corporations. For 100,000 feeder pigs retained and finished in Missouri, this scenario would stimulate $185 thousand in state and local taxes to Missouri and $288 thousand in federal taxes (Exhibits 5 and 6)

Exhibit 5 Annual Tax Impact of 100,000 Feeder Pigs Retained and Finished in Missouri - State and Local Taxes

Description	Total
Dividends	$669
Social Insurance Tax (Employee and Employer)	$2,086
Indirect Business Tax (Sales, Property, Vehicle, Other)	$150,810
Corporate Profits Tax	$7,539
Personal Tax (Income, Property, Vehicle, Other)	$24,175
Total State and Local Tax	**$185,280**

Note: May not sum due to rounding

Exhibit 6 Annual Tax Impact of 100,000 Feeder Pigs Retained and Finished in Missouri - Federal Taxes

Description	Total
Social Insurance Tax (Employee and Employer)	$94,026
Indirect Business Tax (Excise, Custom Duty, Other)	$29,610
Corporate Profits Tax	$107,190
Personal Tax (Income Tax)	$56,827
Total Federal Tax	**$287,654**

Note: May not sum due to rounding

Annual Impact from Various Levels of Feeder Pigs Retained and Finished in Missouri

Based on methodology developed in the previous section, an extrapolation of what the annual economic impacts would be for various amounts of feeder pigs being retained and finished was estimated in Exhibit 7. These impacts are based on the cumulative of the direct, indirect and induced economic effects.

Exhibit 7 Annual Total Impact of Feeder Pigs Retained and Finished in Missouri

Number of Pigs	Employment (jobs)	Labor Income (millions)	Value Added (millions)	Output (millions)	Taxes (millions)
100,000	110.1	$1.0	$2.7	$5.1	$0.5
500,000	550.3	$5.0	$13.5	$25.7	$2.4
1,000,000	1,100.7	$9.9	$27.0	$51.4	$4.7
2,000,000	2,201.3	$19.8	$53.9	$102.7	$9.5