

The Economic Impacts of Increased Contract Swine Production in Missouri¹

Another Viewpoint

John E. Ikerd
Sustainable Agriculture Systems Program
University of Missouri

A 1992 report with the above title began with the following statement; “The State of Missouri is poised at a crossroads with respect to pork production. Developments within the state in the next five years will likely determine the future of pork production in Missouri well into the twenty-first century.” The *Impacts* report describes recent industry trends and points out that “as consolidation has occurred, Missouri has fallen from fourth to seventh in production of swine nationally.” It states the fall in Missouri’s rank “is because a large number of small producers are retiring and the new generation of swine producers willing and able to construct twenty-first century pork production processes has been slow to emerge.” The study concludes that “if this trend continues through the 1990’s, Missouri stands in danger of losing its very significant share of national hog production.”

There is little reason to disagree with any of the above conclusions. Missouri’s national rank in hog production has slipped as large scale, confinement hog operations have expanded dramatically in several other states. The report points to “some hopeful signs” for Missouri swine production because large multi-state producers such as Cargill Swine Products, Murphy Farms of North Carolina, Premium Standard Farms, Tyson Foods and others are now interested in increasing hog production in Missouri.

Presumably, the major problem confronting Missouri’s hog producers and their communities is a drop in national ranking and the solution to this problem is to bring in the large, multi-state corporate hog producers. The *Impacts* report states that “because of direct and indirect economic linkages of the swine production sector to ag and non-ag business throughout the state and region, the economic impact of reversing this significant decline could very well prove pivotal to the economic survival of many towns and regions of the state.” Thus, the report focuses on the potential positive economic impacts of increasing contract swine production in Missouri.

The purpose in presenting this “alternative viewpoint” is not to challenge the earlier assessment of potential employment or net direct employee compensation associated with contract hog production. The fundamental questions addressed here relate to whether “loss in national rank” is the real problem confronting Missouri hog farmers and rural communities and consequently whether “increased contract swine production” is a logical economic development strategy for rural Missouri.

Summary of Selected Conclusions

Conclusions of the *Impacts* study that are relevant to this review are listed below. In some cases, ranges in estimates have been reduced to single figures for simplicity. None of the basic conclusions of the “alternative view” depend on specific figures, but rather hinge on general relationships that might be demonstrated using a wide range of reasonable estimates.¹ An average 600 sow contract farrowing unit (producing 12,000 feeder pigs per year) costs \$550,000 and creates 2.5 new full-time jobs at the site.

1. An average 1,250 head finishing contract unit (finishing 3,400 market hogs per year) costs \$130,000 and creates 0.5 new full-time jobs at the site.

3. For every job created at the site, approximately 0.56 new jobs are created in industries having direct links to the unit (such as feed business, construction, pharmaceutical, veterinary, suppliers, etc.). In addition, 0.66 jobs are created in the rest of the Missouri economy as purchases of other goods increase (primarily retail purchases of goods and services by new employees)
4. The total sustained employment impacts include 1.22 (0.56+0.66) new jobs throughout the economy for each new farm level swine production job, for a total of 2.22 jobs per full-time job created at the hog production site.
5. Each 600-sow contract farrowing unit produces approximately \$57,000 in net direct employee compensation per year to on-site labor
6. Each 1,250 hog finishing contract unit produces approximately \$11,000 in net direct employee compensation per year to on-site labor.
7. Each \$5,000,000 of new investment in contract hog production would create 40 to 44 new jobs in the Missouri economy, depending on the distribution of investment between farrowing and finishing units.

The *Impacts* report states that the model used to estimate employment "is built assuming the existing structure of the swine industry in the state. The proposed new investment is directed toward one particular production structure (namely, contract production). For this reason, some caution is merited in interpreting the results." In fact, there is reason to believe that input purchasing and marketing practices for contract production units might be significantly different from practices of existing hog producers, particularly with regard to the proportion of inputs and supplies purchased within the local community, and even within the state. Thus, the geographic distribution of off-site employment might be significantly different for existing hog operations and new contract production units. Otherwise, the above conclusions seem reasonable and are accepted as given. The basic questions unasked, and thus unanswered, are: what are the logical alternatives to encouraging \$5,000,000 in new investments in contract hog production and what are the alternative consequences for Missouri's rural economy?

An Alternative Viewpoint

The fundamental challenge confronting Missouri hog producers and rural communities is not Missouri's loss in national rank in hog production, but rather the declining availability of quality employment opportunities for farmers and others who choose to live and work in rural Missouri. More hogs may or may not result in more quality employment opportunities. A recent Special Report prepared by the Center for Rural Affairs in Walthill, NE, from USDA Statistics shows that between 1986 and 1993, the state of North Carolina more than doubled their hog numbers, increasing from 2.40 to 5.25 million head (Center for Rural Affairs and USDA, 1993). North Carolina's national ranking among states in hog production rose from 7th in 1986 to 3rd by 1993. However, during this same period, the number of North Carolina hog producers dropped by nearly half, from about 15,000 in 1986 to 8,000 by 1993. During North Carolina's dramatic rise in national rank nearly half of its hog farmers got out of the business.

While these two trends might at first seem contradictory, the results should not be surprising. North Carolina's rise in national rank has been linked to its leadership role in large-scale, corporate and contract hog production. Large-scale confinement hog operations reduce total costs by using production methods which allow fewer people to produce more hogs. The substitution of capital and mass-production technologies for labor and management is the primary advantage that large, specialized hog production units have over smaller, diversified operations.

The production environment in large-scale operations is controlled through utilization of buildings and equipment that require large capital investments but greatly reduce labor requirements. Production technologies associated with large-scale, contract production also change the basic nature of the management function. Mass-production technologies (which standardize genetic selection, breeding, feeding, herd health, and marketing functions) transfer most of the management function from on-site hog producers to corporate production supervisors who travel among production units; and to an even greater extent, to production managers back in corporate headquarters who design and refine production strategies. Large-scale, specialized hog production replaces people with capital intensive, mass-production technologies and centralized management.

A Comparison of Contracts and Individually-Owned Hog Production Units

A simple comparison of results from the *Impacts* assessment report with reports from actual Missouri hog operations serves to illustrate the basic principle of production input and resource substitution. The first column in Table 1 shows the relevant numbers for a basic 600 sow farrowing unit, producing 12,000 pigs/year. A \$550,000 investment would be expected to result in 2.5 on-site jobs with a total direct employee compensation of \$57,000/years or 22,800 per job. The assumed 2.22 impact multiplier results in a total of 5.55 jobs including on-site and off-site employment.

The second column in Table 2 shows the similar implications associated with 3.5 finishing units, a number sufficient to feed out 11,900 hogs per year, a number generally comparable with the number of pigs produced by one basic contract farrowing unit. Note in this case, the investment, number of jobs, and total direct employee compensation have been multiplied by 3.5. The total employment associated with the 3.5 finishing units is 1.75 jobs on-site and 3.89 jobs in total.

Table 1. Comparisons: Contract and Individually Owner Hog Production				
	Contract Farrowing	Contract Finishing	Contract Far-Fin	1992 MIR-hog
Production Units	1.00	3.50	1.00	4.50
Sows	600	0	600	
Pigs/year	12,000	11,900	11,900	
\$Investment B&E	550,000	455,000	1,005,000	1,192,500
\$Total Assets	550,000	455,000	1,005,000	2,452,500
\$Sales		1,368,500	1,368,500	1,306,071
Cwt-Sales			28,510	27,210
Mgt-Labor	0.00	0.00	0.00	6.17
Other Labor	2.50	1.75	4.25	6.44
Total Labor	2.50	1.75	4.25	12.60
Jobs Displaced			8.35	
\$Assets/Person			236,471	194,643
\$Return: Mgt+Capital	**	**	**	270,332
\$Return: Labor	57,000	36,750	93,750	78,975
\$Return: Mgt+Labor	57,000	36,750	93,750	349,307
\$/Unit-Mgt+Lab+(Cap)	22,800	21,000	22,059	27,723
Multiplier	2.22	2.22	2.22	2.22
Total Employment	5.55	3.89	9.44	27.97
Jobs Displaced			18.54	

Displacement Ratio			2.96	to one
\$5 Mil. -- (9 & 11 units)	50.00	42.79	47.18	139.86
Jobs Displaced			92.69	

The third column represents a composite of one farrowing unit and 3.5 finishing units capable of producing approximately 12,000 slaughter hogs/year. Note that the total investment is approximately \$1 million, which includes buildings and equipment costs but no land cost. Total dollar sales are based on 11,900 hogs sold at 250 lbs for \$46/cwt. The number of hogs and price was the same as assumed in the *Impacts* study. A market weight of 250 lbs. was the average reported in 1992 Management Information Records (MIR) production data for hog finishers (Plain). The composite operation results in an estimated 4.25 on-site jobs; total direct employee compensation of \$93,750, or \$22,059 per job; and 9.44 on-site and off-site jobs in total.

The fourth column in Table 1 is based on production data reported in the 1992 Missouri Farm Business Summary (Ehlmann and Hein, 1993). A total of 25 farms participating in the MIR program in 1992 were classified as hog farms. Sales of livestock accounted for about 90 percent of total sales on these farms and livestock accounted for all of net returns. In fact, crop returns, except for crops fed, showed a net average \$12,000 loss to operators of MIR hog farms in 1992. Average sales per MIR hog farm in 1992 was about \$265,000 per farm. Slaughter hog prices in 1992 averaged about \$42/cwt., \$4/cwt. less than the average used in the contract units in Table 1. Total dollar sales for 4.5 MIR hog farms are estimated at \$1.3 million, by adjusting 1992 sales upward to reflect the \$4/cwt. price difference. This brings total sales for MIR hog farms in column four roughly in line with sales for the composite contract farrow-to-finish unit in column three. Note that total investment in buildings and equipment is about the same for the composite contract and MIR hog operations. Additional investment in land and other assets nearly double the "total" investment in MIR operations in comparison to the composite contract unit. Contract operations presumably would require a significant investment in land for manure disposal, however, total assets for contract units in Table 1 reflect only the building and equipment investment.

A key difference between contract and individually owned hog production is found in management and labor requirements. The composite farrow-finish contract operation employs only 4.25 people in the process of generating \$1.3 million in sales of hogs. On the other hand, independently operated hog farms in Table 1 employ 12.60 people in the process of producing a slightly smaller dollar value of hog sales. Large-scale, specialized operations produce more hogs per person employed, and consequently, creates fewer jobs per hog produced. Contract production allows a state to produce more hogs with fewer people. Consequently, large-scale, contract production employs far fewer people than would be employed to produce the same number of hogs in a typical owner-operated hog farms.

Some of the difference in employment is accounted for by the fact that many hog farmers produce a significant portion of their own feed, whereas contract operators typically purchase their feed from outside suppliers. Management functions of independent hog farmers are performed by off-farm supervisors and corporate managers in contract operations. However, when feed is produced on the farms where it is fed and returns to management accrue to local farmers, there is little doubt about whether the economic impacts will be felt in the local community. (The issue of off-farm impacts is addressed more fully below.) In addition, other enterprises on the farm may be critically interdependent with, and thus, fundamentally inseparable from the hog operation on many owner-operated hog farms. Thus, "total" employment on many hog farms may well be dependent on the economic viability of the hog enterprise.

Note also that total assets per person employed in contract production is considerably higher than for MIR hog farms, even though land needed for the contract unit is not included. Total investments on MIR farms include all land, machinery, and equipment associated with all enterprises, including on-farm feed production. However, the contract production asset figures are based on new investment costs whereas

facilities on MIR hog farms were likely of varying ages in 1992 and were reported at depreciated values. Thus, asset comparisons in Table 1 reflect the reality of 1992 rather than an average over some future time period.

Economic returns to operators of well managed owner-operated hog farms are competitive with returns to operators of contract production units. The *Impacts* report includes only direct employee compensation, or returns to labor, in reported estimates of economic performance for contract units. Direct employee compensation for contract production is net of interest and principal payments on buildings and equipment. If the useful life of buildings and equipment exceed the repayment period, some additional returns would presumably accrue to the contract producer's investment. However, total returns to management, labor, and capital for contract operations in Table 1 reflect direct employee compensation estimates.

Returns to capital, management, and operator labor are fundamentally inseparable in owner-operated farming enterprises, although separate returns for different production factors are often "estimated." At 1992 hog prices, returns to management on MIR hog farms were estimated at a negative \$.43/cwt, although the 24 year average shows a positive \$3.58 (Plain, 1993). The difference is approximately equal to the \$4 difference between 1992 hog prices and the \$46 long term average assumed for total returns. The return to management and capital for the MIR hog farms in Table 1 reflects 1992 returns adjusted to reflect the long run average return to management. Returns of labor for MIR hog farms reflect reported compensation for hired labor.

Estimated returns to management, capital, and labor per person employed is over 25 percent higher for MIR hog farms in Table 1 than is the direct employee compensation per person in the contract operations. Some of this difference is quite likely due to the fact that returns to management and equity capital accrue to the farmers in independent hog operations but accrue to corporate managers and investors in the contract operations. However, even the most ardent advocates of contract production freely admit the fact that well managed independent hog operations can compete with large-specialized hog operations. Glenn Grimes of the University of Missouri, who has studied economies of scale in hog production over several decades, concludes: "the lowest-cost one-third of producers are competitive with the best large producers" (Grimes, 1994) The comparisons of economic returns per person for MIR and contract units in Table 1 do nothing more than confirm this conventional wisdom. Well managed independent hog farms can employ more people at compensation levels comparable to those offered by contract hog production.

Comparing Apples to Oranges

Comparing MIR hog farms to contract hog production units is like comparing apples to oranges. One represents whole-farm operations, the other represents hog enterprises. In one, the equity capital and management is on-farm, in the other most of the capital and management comes from the outside. One set of assets represents an investment in a specific set of buildings and equipment; the other represents a wide variety of capital assets at various stages of depreciation. So how can such comparisons have any real meaning? The comparisons have meaning precisely because the two systems represent two very different, but very realistic, futures for hog production in Missouri.

One alternative is to promote large-scale, contract production as a means of increasing Missouri's rank in national hog production in hopes of regaining the state's losses in hog farmers. The other is to promote better management as a means of improving the competitiveness of Missouri's smaller, independently-owned hog operations. These two strategies may require very different kinds of hog production systems. Economic returns to management reflect returns associated with decision making. Mechanized, specialized, tightly controlled production systems allow room for very little individual management input and thus provide very little opportunity to earn a true return to management. Operations with greater potential returns to management tend to be more diverse, complex, and dynamic systems with a great deal of flexibility for managers to make decisions which impact performance. The realistic choices for the

future are not between apples and apples, but rather between apples and oranges. It is more important that comparisons reflect realistic alternatives than that they be clear and easy to make.

Another logical strategy for increasing employment in hog production is to support beginning hog farmers who might choose "low-investment," pasture production systems. One low-investment farrowing system requires less than \$70,000 in buildings and equipment to establish an 80 sow unit capable of turning out more than 1,200 feeder pigs per year. Such a hog production unit would require an 80 percent commitment from one person and is estimated to return about \$15,000 per unit, or \$18,750 per full-time equivalent (Osburn, 1994). The estimated return per unit of labor and management is about 15 percent less than for the contract farrowing unit in Table 1. However, the investment per person employed in the contract unit is two-and-one-half times as great as for the low investment facility, excluding land costs in both cases. In terms of hog farm employment, ten low-investment units would produce 12,000 feeder pig per year and create 8 full-time positions. A single contract farrowing unit producing about the same number of pigs but would employ only 2.5 people. Large-scale contract units would produce more hogs per person, but the low-investment units would employ far more people per hog produced or per dollar invested in hog production.

Missouri hog producers have a variety of potentially viable options for hog production in the 21st century. To support one model of 21st century hog production, and not support others implies the only choice is between apples and nothing. The people of Missouri, including hog farmers and others who live and work in rural communities, should be allowed to choose their own future. If they choose apples over oranges, it will have been their choice. However, given a choice between apples, oranges and bananas, they just might choose some of all three.

The Question of Employment Multipliers

On-site or on-farm employment in hog production generates additional economic activity in the local community, in the state, and in the larger economy. The *Impacts* report utilized average state level impact multipliers of .56 for off-site employment in agricultural related enterprises and .66 for indirect effects in the general retail and services sectors. However, these estimates are based on the existing structure of hog production in Missouri rather than on contract production, as indicated previously. One might argue that contract producers are likely to purchase a larger proportion of their production inputs, particularly feed, rather than produce it on the farm, and thus might generate more local purchases. However, the low-investment feeder pig operation described above was budgeted assuming that all feed was purchased, as was the case for the contract farrowing unit. Even if off-farm purchases were greater for contract units, contract producers might be less likely to purchase inputs, including feed, from local, or even in-state suppliers. A recent Minnesota study, which included examination of tax records of large and small livestock producers, indicated that smaller producers bought a greater proportion of their inputs locally. For smaller livestock farmers (annual gross sales less \$400,000), the weighted average of local spending (within 20 miles) was 79 percent; whereas for larger farmers the weighted average of local spending was only 47.5 percent (Chism, 1993). Based on this study, the 80 sow "low-investment" feeder pig operations may be more supportive of local input suppliers than either larger owner-operated or contract operations. However, contract producers might have fewer ties to the local community and thus less loyalty to local suppliers than would larger independent producers.

A series of studies spanning over two decades have consistently documented the negative impacts of trends toward large-scale, specialized farming operations on rural communities. John Allen, in a paper included in the proceedings of the 1993 Breimyer Agricultural Policy Seminar, provides a set of references to studies on the subject for anyone who cares to review the research in this area (Allen, 1993). A study by Labao is typical in its findings that "an agricultural structure that was increasingly corporate and non-family owned tended to lead to population decline, lower incomes, fewer community services, less participation in democratic processes, less retail trade, environmental pollution, more unemployment, and an emerging rigid class structure" (Center for Rural Affairs, 1994). The obvious decline in quality employment opportunities in agriculturally dependent communities over the past several decades should provide clear evidence to the thoughtful observer that larger, more specialized farming

operations have not provided more quality employment opportunities in rural communities than did the smaller, diversified farms they replaced. An increase in large-scale, contract hog production can only be expected to accelerate the past trends toward declining rural employment and rural economic decay.

The question of in-state impacts is somewhat different from that of local community impacts. However, uniformity and quality control are strong principles underlying low-cost, large-scale production. The demand for uniformity and quality control will be strong forces for centralization of input purchasing, and ultimately for centralization of input production, under the control of corporate contractors. The resulting uniformity of production will be a strong force also for vertical integration of production, slaughter, and processing, if potential market premiums for uniform production are to be realized. Whether the off-site activities associated with contract production are located in one state or another will likely be determined by factors other than location of the contract hog production units. Most contractors currently interested in Missouri appear to be out-of-state corporations. There are obvious public relations benefits associated with "buying local", during the time when contractors are attempting to gain acceptance in a community and are soliciting contracts with local producers. However, long run personal, corporate, and political interests may well lie much more in supporting the economies of states where corporate headquarters are located, and thus where the corporate executives and their families live.

In time, the answer to the questions of off-farm impacts of increased contract hog production will become more apparent. However, off-site impacts magnify on-site differences in employment among systems, even if the state-level multipliers for contract hog production are assumed to be no smaller than for independently owned hog farms. Note in Table 1 that a single farrowing unit would generate a total of 5.55 jobs, and 3.5 finishing units would add 3.89 jobs for a total of 9.44 jobs including on-site and off-site employment in the composite farrow-to-finish contract unit. MIR farms producing a comparable number of hogs would create 27.97 full-time employment opportunities, a difference of 18.54 jobs per 12,000 hogs produced. Ten low-investment hog operations might be expected to generate 17.6 jobs, on-site and off-site, in the process of producing 12,000 feeder pigs. These smaller farrowing units could support 12 more full-time workers than would be supported by a 600 sow contract farrowing unit producing the same number of pigs.

Who Benefits and Who Loses

If new contract hog units were to replace independent operations producing the same number of hogs, approximately two hog farmers would be left without jobs for each new job created. In the process of changing \$1.3 million in hog production from independently-owned production to contract production, a net of 18-19 jobs currently linked to hog production would be displaced. A new \$5 million investment in contract production would generate 40-50 new jobs but would displace approximately three-times that number of independent hog farmers.

There is no reason to believe that contract hog production will "add to" rather than "displace" existing hog production. Hog farmers' receipts from sales of live hogs account for only about one-third of the total cost of pork to consumers at the retail level, therefore, any reduction in farm level production costs is divided by three before it reaches the consumer level. Increases in total hog production made possible by marginally lower average farm-level costs are likely to be negligible in comparison to hog production displaced by contract production.

The obvious argument in favor of contract hog production in any given community, or state, is that the gains will be concentrated locally and the losses will be spread around elsewhere. An even more common argument is, if Missouri doesn't expand contract production, Missouri farmers will be displaced by contract producers in other states. A comparison of trends in North Carolina and Nebraska clearly refute this claim. Nebraska has a law against corporate hog production while North Carolina is clearly a leader among states in corporate hog production. During the 1986-93 period while the number of hog farmers in North Carolina fell by nearly one-half, total hog production and the total numbers of hog farmers in Nebraska remained virtually unchanged (Center for Rural Affairs, 1994). Nebraska kept its hog farmers employed without promoting large-scale corporate contract hog production. On the other hand,

the farmers displaced most frequently by increased corporate hog production in North Carolina appear to have been independent North Carolina hog farmers. The associated negative economic and social impacts quite likely have been felt most keenly in North Carolina's rural communities. This evidence would suggest that while the gains from contract production may be concentrated close to home, a lot of the economic losses may be felt fairly nearby. The pain of displacement and dislocation cannot necessarily be exported to other states.

Alternatives for the Future

Contract hog production is a reality of the current agricultural environment. It seems quite likely that contract hog production will become more common over time in spite of anything that its opponents may do to slow its spread into new areas of the country. Contract hog production simply continues a long term trend toward industrialization of the agricultural economy. Industrialization at first appears to increase productivity of human resources through mechanization and mass production technologies. However, over time, industrial technologies replace more and more labor with mechanization. Over time, the management function also becomes more concentrated among fewer and fewer people. The traditional economic assumption is that more efficient production, in general, will increase total economic output by enough to provide new jobs for displaced workers in newly emerging sectors of the economy. However, the growing number of displaced workers in the American economy, who now range from underemployed to permanently unemployable, has begun to raise serious questions about the traditional economic assumptions with respect to gains from further industrialization.

Rural Missouri cannot retreat to an earlier time when cost competition was less keen, full-time family farms were the norm, and agricultural communities were strong and growing. However, there is clear evidence that independently-owned, modest-sized, family-operated hog farms can be commercially competitive with current contract production units. There is also clear evidence that successful, modest-sized, family-operated hog farms contribute more to the economic and social well being of rural communities than do their corporate counterparts. It would seem that a goal of improving management capabilities of independent hog farmers should receive at least as high a priority as contract hog production as a rural economic development strategy. Greater reliance on intensive management creates more quality employment opportunities in rural areas by enhancing the productivity of people rather than replacing people with capital investments and large-scale, mass-production technologies.

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