

Economic Impact of Concentrated Livestock Production in Vernon County



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Executive Summary

Livestock production in Vernon County, Missouri is an important contributor to the local economy. Revenue received from livestock production in 2007 exceeded \$90 million which generated an output impact of \$132 million. Vernon county livestock producers paid approximately \$237,000 in property taxes in 2008 and \$2.2 million for the period 1994-2008.

Labor estimates show that there are approximated 392 full-time equivalents employed as a result of livestock production in Vernon County.

Several studies have indicated that increased corn demand from livestock operations can affect local corn prices; as the demand increases, the local corn price will increase. Average annual corn production in Vernon County during the 5-year period from 2004 to 2008 was 5,380,800 bushels. Livestock production alone annually used 4,457,101 bushels of this corn for livestock feed. This equals 83% of the corn produced in the county. With such a large amount of corn needed to supply livestock operations with feed, local corn prices increased and local corn producers benefitted from higher corn prices. Every \$.05/bushel price improvement results in over a quarter of a million dollars more income for Vernon County crop farmers.

Introduction

During the last 30 years, animal inventories have increased in Missouri while the number of farms with livestock has decreased. This has created an interesting culture of feed grain farmers and citizens who do not raise livestock and do not always welcome livestock in their county. While not all farmers raise livestock, crop farmers and citizens are affected by the economic impact of local livestock production. This paper is an effort to quantify the economic impact of swine, dairy, and poultry production in Vernon County.

Vernon County is somewhat unique in Missouri because it is one of only two Missouri counties that have increased in number of pigs, dairy *and* poultry produced over the last 20 years. Vernon County is one of only 19 counties in Missouri which have increased in hog inventory from 1987 to 2007. It is one of 16 which have increased in poultry inventory; of 10 in dairy inventory. Vernon County, Missouri received approximately \$90 million, or 70%, of its value of agricultural products, from livestock and poultry production in 2007. Vernon County ranks 10th in the state for value of livestock and poultry production.

This report uses three related methods of measuring the economic impact of livestock production. First, we used gross livestock receipts, as estimated by the USDA 2007 Census of Agriculture, to estimate the impact of livestock production on the economy. In a further analysis we used actual property tax revenues related to livestock production to estimate the impact on the local economy. In a third analysis we looked at specific livestock production costs that affect the local economy.

The first two methods used an economic model called IMPLAN that is frequently used to estimate the impact of a business on the economy. We added the third analysis of production costs because it gives a more intuitive understanding of how livestock operations affect the local economy.

Because most of the swine and poultry production in Vernon County are managed by integrators with few actual animal sales on the open market, we chose to look at the production costs that would most likely have a local impact. Within the cost of production analysis we concentrated on cash operating costs because they circulate locally within the economy. While investment in existing buildings and equipment are not considered current major economic drivers in this report, expenditures on feed, labor, and other inputs are.

Tax receipts from 2008 swine, poultry, and dairy operations were obtained from the county's tax assessor's office. The final section of this report shows how these tax revenues were distributed in the county.

Economic Impact

Money circulates throughout an economy in different ways. When a rancher raises a cow, he purchases inputs such as feed and medicine. This purchase *directly* impacts the

economy. But the money does not stop with the farmer growing the feed or veterinarian supplying the medicine. Both the farmer and the veterinarian spend money to purchase inputs such as seed and fertilizer and buildings. This continued movement of the money originally spent on feed and medicine *indirectly* (from the viewpoint of the original livestock producer) impacts the economy. But the money does not stop there. The farmer and veterinarian and their employees take the money they received and purchase food and clothing at local retailers. This continued movement of money through the economy is considered an *induced* effect of the original production of livestock.

The direct, indirect, and induced economic impacts of property tax and livestock receipts paid in Vernon County were estimated using a model from the University of Minnesota called Impact Analysis for PLANning (IMPLAN). IMPLAN is one of the most widely used and recognized databases for input-output analysis.

Annual Impact of Livestock Receipts

According to the 2007 Census of Agriculture, Vernon County livestock producers received over \$90 million dollars from livestock production in 2007. This \$90 million is money received as a direct result of livestock production in the county. IMPLAN estimates the indirect and induced impacts of the livestock receipts were \$38 million and \$4.4 million respectively. Total output impact for livestock production was \$132M for 2007 alone.

Table 1. Livestock Receipts Output Impact

Industry	Direct	Indirect	Induced	Total Impact
Total Livestock Production Impact	\$90,071,000	\$37,902,326	\$4,470,036	\$132,443,364

Annual Impact of Tax Receipts

Though it is not as easy to visualize, government activities also have direct, indirect, and induced impacts on the local economy. Property taxes paid to government entities *directly* influence the number of people employed and supplies purchased. This employment and accompanying purchases *indirectly* affect other businesses in the community. The expenditures of hired government employees and businesses supplying the demands of government actions create an *induced* effect on the local economy. A peculiarity of tax receipts is that they experience leakages. While the direct impact of livestock receipts equals the amount received, the direct impact of tax receipts is estimated to be lower than the amount received.

Table 2 presents the total output impact of tax receipts. The output impact is the dollar value of output generated from livestock *tax revenues* in 2008. Although approximately \$237,000 was received from livestock operations, the value of the output impact was about \$200,000. This is because of leakages from purchasing inputs. These leakages do not create any *local* economic activity and thus diminish the total value of livestock property taxes

paid. Of the \$200,000 in total output impact, about \$144,000 was direct economic impact, \$11,000 was indirect economic impact and over \$45,000 was induced economic impact.

Table 2. Output Impact

Industry	Direct	Indirect	Induced	Total Impact
Total Output Impact (all sectors)	\$144,677	\$11,055	\$45,232	\$200,964
Total Value Added Impact				
Employee Compensation	\$92,750	\$2,029	\$9,593	\$104,372
Total Proprietor Income	\$3,711	\$739	\$2,535	\$6,986
Other property Income	\$15,695	\$1,625	\$9,007	\$26,326
Indirect business tax	\$1,356	\$315	\$2,715	\$4,386

The total of property taxes paid by livestock producers work through the local economy in several ways. Table 2 highlights one way: the value added impacts of the tax revenues. Value added impact is quantified in the categories of employee compensation, total proprietor income, property income and indirect business tax revenues to the county government. Employee compensation includes the wages, salaries, and benefits paid by employers. Proprietary income is income received by self employed individuals. Other property income is payments from rent, royalties, dividends, etc. Indirect business taxes are excise and sales taxes collected by business from individuals and paid to the government.

Cost of Production Impacts on Vernon County

In the long run, receipts from sales cover the total cost of production and profit (or loss). However, not all receipts from sales have the same local economic impact. Depending on the type of business (e.g. manufacturing or retail) and the organization of the business (e.g. sole proprietorship or corporation), varying amounts of the sales have local impact. This report, in an attempt to understand the local impact of livestock production in Vernon County, concentrates on costs that are likely to affect the local economy.

Vernon County has about 101,000 sows and 64,000 nursery pigs in inventory at any one time. Sows are constantly in inventory; nursery pigs are fed for approximately 40 to 45 days before being shipped to finishing facilities outside of the county. The actual number of nursery pigs fed in a year in Vernon County exceeds 460,000. Using published costs of production data for sow facilities and nursery pigs, we estimated the total annual cost of production for the swine facilities to be over \$80 million. Of this, approximately \$50 million would be expenses likely to impact local economic activity (see table 3).

Vernon County has approximately 4,200 head of dairy cows in inventory. Dairy production in Vernon County tends to be pastured-based, where cows graze grass and are fed less concentrated feed than confinement dairies. It is estimated that dairies annual total cost of production is \$5.9 million annually with \$4.8 million in variable costs (see table 3).

Vernon County has about 274,500 head of pullets for laying flock replacement and 73,300 head of turkeys in inventory. Poultry (chickens and turkeys combined) incur approximately \$3.5 million annually in variable costs (table 3).

Table 3. Cost of Production

Cash Costs	Swine	Dairy	Poultry	County
Inventory (January 2008)	174,000	4,200	347,880	526,080
Variable Costs				
Feed cost	\$28,734,557	\$2,573,305	\$3,244,325	\$34,552,187
Labor	\$10,007,956	\$1,187,949	\$90,090	\$11,285,995
Utilities, fuel and repair	\$2,887,620	\$459,669	\$188,500	\$3,535,789
Veterinary medicine	\$4,445,560	\$196,560	-	\$4,642,120
Other	\$3,492,248	\$448,490	\$52,923	\$3,993,661
Total Variable Costs	\$49,567,941	\$4,865,973	\$3,575,838	\$58,009,752
Fixed Costs				
Operating Interest	\$946,212	-	-	\$946,212
Building and Equipment	\$15,772,194	\$545,377	\$357,500	\$16,675,071
Breeding Herd	\$13,967,492	\$561,841	-	\$14,529,333
Total Fixed Costs	\$30,685,898	\$1,107,218	\$357,500	\$32,150,616
Total Costs	\$80,253,839	\$5,973,191	\$3,933,338	\$90,160,368

1. Open cells mean reliable data could not be found.

The total livestock cost of production is estimated to exceed \$90 million; almost 2/3 of this, or \$58 million, is on expenses that are expected to directly impact the economic activity of the county (table 3).

Feed Costs in Vernon County

The feed fed locally to livestock will increase the demand for local feed grains. It is estimated that livestock production in Vernon County demands \$34.5 million in feed (table 3). The absence of livestock production would be expected to decrease demand, and hence, decrease the value of feed grain produced in Vernon County.

Several studies have shown that increased corn demand from livestock and ethanol production affect the local price of corn^{1,2}. Local corn price increases because local corn use increases corn demand. Without the local use by livestock, the grain would be shipped out of the county for use, decreasing its value by the cost of transportation to the nearest user.

Average corn production in Vernon County from 2004 to 2008 was 5,380,800 bushels. Swine production alone in Vernon County consumed an estimated 4,000,000 bushels of corn. This amounts to 74% of the corn production in Vernon County. Poultry accounted for 6.1% and dairy accounted for 2.4% (table 4).

Table 4. Vernon County Corn Production and Usage

Corn Production and Use	Quantity	
	(Bushels)	(Percent)
Vernon County Corn Production	5,380,800	
Corn Use		
Swine	4,000,000	74%
Dairy	128,000	2%
Poultry	329,101	6%
Total Fed to Livestock	4,457,101	83%

A South Dakota study indicated that ethanol production increased the value of corn in various regions of the state from \$.04/bushel to \$.27/bushel, and that livestock demand for an additional bushel of corn increased the value more than ethanol demand for an additional bushel¹. One of the determinants of increased value was the increase in corn demand relative to the total production in that region. Since Vernon County livestock uses over 80% of the corn produced in the county it would likely have a large impact.

While studies indicate that corn prices improve with increased livestock and ethanol demand, it does not quantify the amount for Vernon County. Undoubtedly, the impact probably lies between \$.05 and \$.30 per bushel. Every \$.05/bushel price improvement results in over a quarter of a million dollars more income for Vernon County crop farmers.

Labor

Using published budgets, we estimate that the total number of full time equivalent jobs working in animal husbandry in Vernon County is 392 – distributed as 352 for swine, 35 for dairy and 5 for poultry. Estimated payroll of livestock producers in Vernon County exceeds \$11 million (table 3) for an average annual salary of approximately \$29,000 per worker. Not included in this estimate of livestock impact on employment are the full and part-time employees that are associated with livestock production (e.g. veterinarians, feed manufacturers, etc.) but not directly employed by the livestock producer.

Utilities & Other Inputs

Utilities of \$3.5 million include water, natural gas and electricity provided by the local suppliers. Veterinary medicine expense of \$4.6 million includes both the cost of veterinarian services and pharmaceuticals. These expenses are likely to be regional and have an impact on the county (table 3).

An estimated \$4 million spent on other inputs such as supplies, insurance, fertilizer and parts for repairs are also likely to come from local sources and improve the economic condition of the county (table 3).

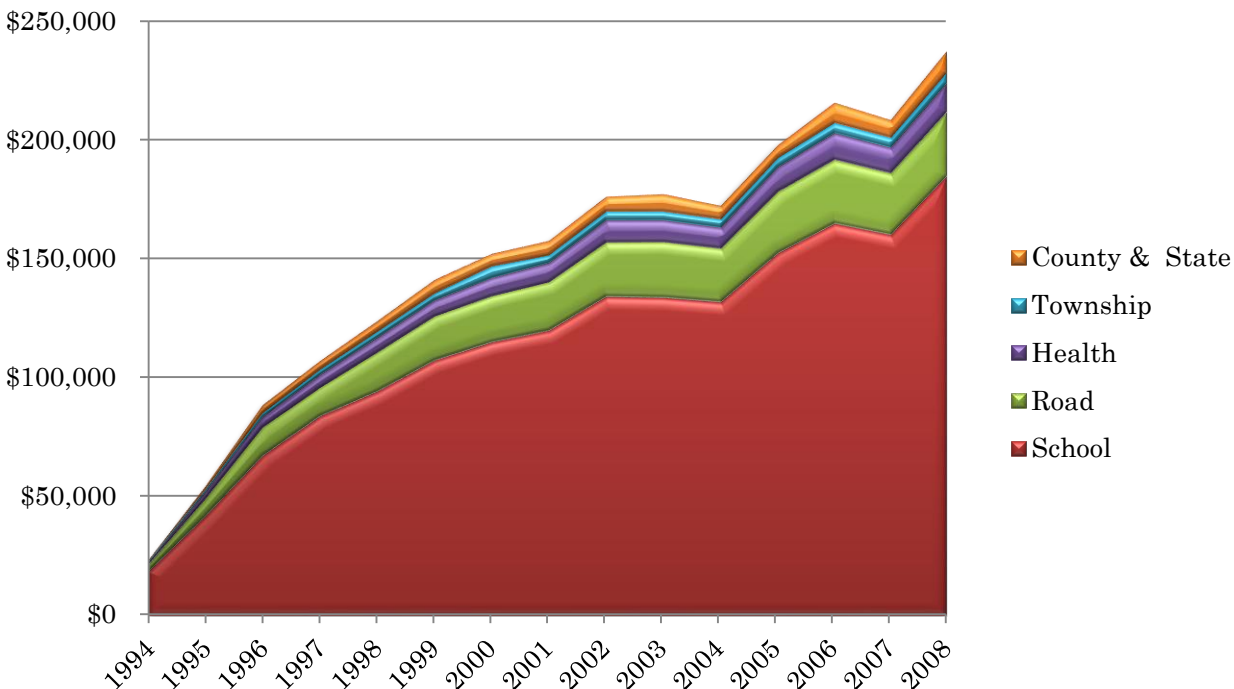
Property Tax Receipts

An interesting phenomenon of current livestock production practices is the increased property taxes associated with confinement production. Livestock, buildings and equipment involved in livestock production are subject to property taxes. Because confinement production concentrates more animals on less land and increases capital investment in buildings and equipment, the tax base in the county increases relative to other forms of agricultural production.

Figure 1 provides a historical view of all property taxes received by Vernon County from livestock operations from 1994-2008. The legend details where those property taxes were allocated within the county. The total sum of tax receipts received over that period by Vernon County was \$2.2 million. Total taxes received steadily increased from 1994 until reaching a peak of \$237,000 in 2008, the last year for which data are available.

The relative contribution of livestock related property tax receipts to all property tax receipts increases from 0.04% in 1994 to 1.8% in 2008.

Figure 1. Vernon County Property Tax Receipts



School District Impact

Vernon County’s five school districts educated approximately 4,600 students in 2008. Table 5 illustrates how much each school district receives from livestock related property taxes as well as the funding amount per student. Sheldon and Northeast Vernon school districts

have the largest livestock related property tax receipts and the greatest funding per student derived from livestock related property taxes.

Table 5. Vernon County Tax Receipts to School Districts (2008)

	Total Livestock Tax Receipts	Students	Funding/ student
Bronaugh	\$4,870	243	\$20.04
Eldorado	\$30,251	1,253	\$24.14
Nevada	\$17,873	2,664	\$6.71
NE Vernon	\$42,032	249	\$168.80
Sheldon	\$89,608	195	\$459.53
Grand Total	\$184,634	4,604	

Vernon County Townships

Vernon County is comprised of 20 townships, but only 12 of those townships actually contained livestock animal operations in 2008. Table 6 reports livestock related tax revenues by township, distinguishing how much is allocated to roads and to township expenses.

Table 6. 2008 Vernon County Township Tax Receipts

	Township Tax	Road Tax
Bacon	\$593	\$2,076
Badger	\$224	\$1,090
Blue Mound	\$221	\$996
Coal	\$105	\$369
Dover	\$1,333	\$8,285
Drywood	\$19	\$111
Harrison	\$37	\$262
Lake	\$75	\$637
Metz	\$34	\$235
Montevallo	\$1,758	\$10,547
Moundville	\$96	\$616
Walker	\$166	\$1,126
Washington	\$94	\$613
Total	\$4,756	\$26,961

Endnotes:

¹Olson, A., N. Klein, et al. (2007). The Impact of Increased Ethanol Production on Corn Basis in South Dakota. AAEA Annual Meeting. Portland, OR.

²Du, X., D. A. Hennessy, et al. (2007). Determinants of Iowa Cropland Cash Rental Rates: Testing Ricardian Rent Theory. Ames, IA, Iowa State University, Center for Agricultural and Rural Development.

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