

# Summary Measures of the Economic Importance of Agri-food Industries in Warren County, Iowa

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This summary report provides county-level statistics for Warren County, Iowa as a supplement to *The Economic Importance of Agri-food Industries in Iowa*<sup>1</sup> (hereafter referred to as the “state report”). Throughout this summary, local data will be presented that reflects the data provided in the state report. Brief descriptions of the data will be provided along with references back to the state report for more detailed explanations of the data and its use.

Table 1 shows that Warren County had 1,338 farms in 2002. These farms averaged 224 acres apiece compared to an average of 350 acres per farm, statewide. Nationwide, farms are generally larger than in Iowa. The average US farm included 441 acres in 2002. The estimated market value of land and buildings per farm in Warren County was \$401,657 in 2002, compared to \$808,152 for Iowa and \$604,403, nationwide. In 2002, Warren County farms marketed an average of \$39,941 worth of farm products according to the US Census of Agriculture.

Table 1. Warren County Farm Statistics from the US Census of Agriculture

	Warren County		Iowa		United States	
	2002	1997	2002	1997	2002	1997
Number of farms	1,338	1,329	90,655	96,705	2,128,982	2,215,876
Land in farms (acres)	299,216	315,263	31,729,490	32,313,119	938,279,056	954,752,502
Average farm size (acres)	224	237	350	334	441	431
Market value, per farm, of						
Land and buildings (\$)	351,293	351,010	707,730	559,678	537,833	416,007
Machinery and equipment (\$)	50,364	49,398	100,422	79,607	66,570	53,861
Farm products sold (\$)	39,941	46,853	135,388	125,766	94,245	90,880

Table 2 shows employment data for Warren County and the state of Iowa compiled within a framework used by the US Department of Agriculture (USDA) to identify a broad range of farm and farm-related employment. These numbers are a reduced set of the statistics provided as Table 4 in the state report. The USDA compiles these employment numbers annually for each of the 50 states<sup>2</sup>. For this summary, we have used the USDA classification system and data from the US Bureau of Economic Analysis and the Iowa Department of Workforce Development to generate similar results for Warren County. Detail is restricted in this summary, due to the smaller employment base and privacy issues at the county level.

<sup>1</sup> Mark Imerman, David Swenson, Liesl Eathington, Daniel Otto. Iowa State University Department of Economics. 2005.

<sup>2</sup> The USDA's definition of farm-related industries includes all food-based businesses through retailing and restaurants. Substantial portions of packaging manufacture, of gravel and lime extraction, and apparel manufacturing are also included. A discussion of the implications of the breadth of this framework is included on pages 6-9 of the state report.

Table 2. USDA-style Compilation of 2002 Farm and Farm-related Employment (Jobs)

	Warren County			Iowa	
	Jobs	As a percent of County total	As a percent of State Category	Jobs	% of state total
Farm and closely-related	1,563	10.77	0.77	201,967	10.57
Peripherally-related	1,696	11.69	0.88	191,669	10.04
Total farm and farm-related	3,259	22.47	0.83	393,636	20.61
Total employment	14,508	100.00	0.76	1,909,934	100.00

Data derived from the US Bureau of Economic Analysis and the Iowa Department of Workforce Development within a framework obtained from the USDA.

Tables 3 and 4 estimate the value of a more restricted definition of the agri-food industries for Warren County. These tables are consistent with Tables 5 and 6 in the state report. Estimates included in these tables limit the agri-food industries to ag production (traditional farm production and nonfarm production facilities), food and other primary farm commodity processing, and ag input manufacturing (machinery, ag chemicals, and fertilizer)<sup>3</sup>.

Table 3 provides value estimates for an industry-only aggregation of the economic activity that takes place within Warren County's borders. Output is the value of total in-county production for each industry in 2002. Value-added is the value that was added to Output by each industry's in-county production process. The difference between Output and Value-added is the value of purchased inputs that go into the production process. For individual industries, these inputs may be sourced from out-of-county or from within the county. Value-added represents the value of Output minus the value of purchased inputs. Table 3 also provides an estimate of jobs<sup>4</sup> and labor income (compensation for employees and proprietors) within the agri-food industries in Warren County.

Table 3 shows that, in 2002, the total output value of Warren County's agricultural production industry was \$63.648 million. \$24.915 million of this output (39.15 percent of the total output value) was the value added to the output by Warren County's ag production activity (ag production's value added). The remainder came from purchased inputs into the process (from either in-county or out-of-county sources). 58.06 percent of this value added, or \$14.465 million, was paid out as compensation to the 1,289 production agriculture jobs in Warren County.

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<sup>3</sup> Estimates were generated through a process of recompiling and analyzing statistics derived from the IMPLAN database system maintained by MIG, Inc. A detailed discussion of the estimates presented here, the differences between the two tables, and how they can be interpreted is provided in pages 9 through 17 of the state report.

<sup>4</sup> Jobs do not refer to the number of people working or to full-time-equivalent employment. Jobs can be full or part time. A single individual can hold multiple jobs. In short, jobs cannot be looked upon as interchangeable or comparable across industries, businesses, or location. Comparisons of wages and compensation are more appropriate in an economic value context.

Table 3. Industry-only Estimation Based on IMPLAN and Census Data

<b>Warren County</b>		<b>Labor</b>		<b>Value-Added</b>	
<b>Agricultural Production</b>	<b>Output*</b>	<b>Jobs</b>	<b>Income*</b>	<b>Value*</b>	<b>Pct. Of Tot.</b>
Oilseeds	13.494	234	4.435	7.255	1.42
Grain	19.657	513	4.681	8.902	1.75
Other Crops	8.149	58	1.571	4.246	0.83
Cattle	12.279	151	0.039	0.878	0.17
Poultry	0.000	0	0.000	0.000	0.00
Hogs and Pigs	4.817	197	0.268	0.748	0.15
Other Ag Production	5.252	136	3.471	2.886	0.57
<b>Sum of Ag Production</b>	<b>63.648</b>	<b>1,289</b>	<b>14.465</b>	<b>24.915</b>	<b>4.89</b>
<b>Primary Food Processing</b>					
Crop	6.334	14	0.763	1.355	0.27
Dairy	0.000	0	0.000	0.000	0.00
Meat	0.000	0	0.000	0.000	0.00
<b>Sum of Primary Food Proc.</b>	<b>6.334</b>	<b>14</b>	<b>0.763</b>	<b>1.355</b>	<b>0.27</b>
<b>Other Food/Ag Processing</b>					
Animal and Pet Foods	0.000	0	0.000	0.000	0.00
Other Food Processing	2.584	9	0.438	1.110	0.22
<b>Sum of Other Ag Proc.</b>	<b>2.584</b>	<b>9</b>	<b>0.438</b>	<b>1.110</b>	<b>0.22</b>
<b>Ag Input Manufacturing</b>					
Ag Chemical and Fertilizer	1.280	3	0.380	0.554	0.11
Farm Machinery	15.493	169	-13.734	-8.035	-1.58
<b>Sum of Ag Input Mfg.</b>	<b>16.773</b>	<b>172</b>	<b>-13.354</b>	<b>-7.481</b>	<b>-1.47</b>
<b>Sum of All Agri-food Ind.</b>	<b>89.339</b>	<b>1,484</b>	<b>2.312</b>	<b>19.899</b>	<b>3.91</b>
<b>NonAg Industries</b>	<b>793.106</b>	<b>10,750</b>	<b>304.977</b>	<b>489.340</b>	<b>96.09</b>
<b>Totals</b>	<b>882.445</b>	<b>12,234</b>	<b>307.289</b>	<b>509.239</b>	<b>100.00</b>

\* Numbers represent millions of dollars

If we add food and other ag processing and ag input manufacturing to agricultural production, the value of Warren County's agri-food industry output was \$89.339 million, or 10.12 percent of Warren County's total industrial production. Of this, \$19.899 million (22.27 percent) was value added within these industries in Warren County. \$2.312 million of this value added was paid out as wages and salaries to the 1,484 agri-food industry jobs in the county.

Overall, Table 3 shows that Warren County's agri-food industries directly accounted for 10.12 percent of the county's total output, 3.91 percent of total value added, 0.75 percent of labor income, and 12.13 percent of the county's jobs<sup>5</sup>.

<sup>5</sup> It is unusual but possible for counties to have negative output, value-added, and labor income values in some categories, resulting in negative percents of totals. Where this happens, it is generally due to write-downs of assets and proprietor interests due to firm closings or bankruptcies, market situations where output must be sold at less than production costs, or reverse flows of incomes, pensions, or benefits.

Table 4. Industry-of-output aggregation including local inputs

Warren County	Output*	Income*	Value Added*	Value Added As a Percent of Nonhousehold	
				Total V.A.	Demand
<b>Agricultural Production</b>					
Oilseeds	18.720	7.691	10.707	2.10	3.79
Grain	23.504	8.392	12.001	2.36	4.25
Other Crops	5.256	1.885	2.929	0.58	1.04
Cattle	19.238	3.121	5.123	1.01	1.82
Poultry	0.000	0.000	0.000	0.00	0.00
Hogs and Pigs	6.904	1.319	2.109	0.41	0.75
Other Ag Production	3.700	1.489	1.793	0.35	0.64
<b>Sum of Ag Production</b>	<b>77.323</b>	<b>23.898</b>	<b>34.661</b>	<b>6.81</b>	<b>12.29</b>
<b>Primary Food Processing</b>					
Crop	10.174	2.552	3.796	0.75	1.35
Dairy	0.000	0.000	0.000	0.00	0.00
Meat	0.000	0.000	0.000	0.00	0.00
<b>Sum of Primary Food Proc.</b>	<b>10.174</b>	<b>2.552</b>	<b>3.796</b>	<b>0.75</b>	<b>1.35</b>
<b>Other Food/Ag Processing</b>					
Animal and Pet Foods	0.000	0.000	0.000	0.00	0.00
Other Food Processing	1.197	0.371	0.583	0.11	0.21
<b>Sum of Other Ag Proc.</b>	<b>1.197</b>	<b>0.371</b>	<b>0.583</b>	<b>0.11</b>	<b>0.21</b>
<b>Ag Input Manufacturing</b>					
Ag Chemical and Fertilizer	1.568	0.565	0.768	0.15	0.27
Farm Machinery	15.710	-10.935	-7.651	-1.50	-2.71
<b>Sum of Ag Input Mfg.</b>	<b>17.279</b>	<b>-10.370</b>	<b>-6.883</b>	<b>-1.35</b>	<b>-2.44</b>
<b>Sum of All Agri-food Ind.</b>	<b>105.973</b>	<b>16.451</b>	<b>32.157</b>	<b>6.31</b>	<b>11.40</b>
<b>NonAg Industries</b>	<b>435.508</b>	<b>187.711</b>	<b>249.982</b>	<b>49.09</b>	<b>88.60</b>
<b>Household Consumption</b>	<b>340.965</b>	<b>888.917</b>	<b>227.101</b>	<b>44.60</b>	<b>80.49</b>
<b>Totals</b>	<b>882.445</b>	<b>1,093.079</b>	<b>509.239</b>	<b>100.00</b>	<b>180.49</b>

\* Numbers represent millions of dollars

Table 4 shows a different aggregation of the county's industrial output. Table 4 is derived from the same data as is Table 3, and total values for Table 4 are identical to total values for Table 3. The difference is the point at which values were counted. In Table 3, values were counted in each industry where productive activity took place. In Table 4, values were counted at the industry that made the final export (out-of-county) sale of goods and services produced<sup>6</sup>. This is final demand analysis. It helps illustrate the magnitude of inter-industrial linkages and the value of those linkages to local income generation from export sales<sup>7</sup>.

<sup>6</sup> Goods not sold out of county were counted under the heading of "Household Consumption" and not in industry totals in Table 4.

<sup>7</sup> The point at which final products are sold out-of-county was chosen as an endpoint because it coincides with the point at which industrial output brings revenue into the county. This point also avoids problems

Table 4 reallocates all industrial activity in the county to the sectors producing goods for sale beyond the county's borders (export sale). This means that if there is a local meat packer that purchases all of its live cattle from local farmers, the output value, value-added, and personal income generated in the production of those cattle is aggregated up to the meat packing industry. Similarly, the value of locally produced farm machinery purchased for use on local farms is not included in the aggregation under farm machinery, but is subsumed under agricultural production (and partially subsumed, again, into food processing if the farm output that it was used to produce passes through local food processors on its journey to final sale outside of the county). In a nutshell, the output, value-added, and income estimates in Table 4 estimate the total share of the local economic activity utilized to generate final output from the agri-food sectors.

Under this aggregation, the total exported output value of locally produced goods and services supporting Warren County's agricultural production industry was \$77.323 million. \$34.661 million of this output (44.83 percent of the total output value) was the value added to the output by economic activity within Warren County (value added). The remainder came from inputs purchased from out-of-county sources. 68.95 percent of this value added, or \$23.898 million, was paid out as personal income to residents of Warren County that were involved (as workers, owners, investors, etc) in these activities.

If we add food and other ag processing and ag input manufacturing to agricultural production, the export value of goods and services supporting Warren County's agri-food industry output was \$105.973 million, or 12.01 percent of Warren County's total industrial production. Of this, \$32.157 million (30.34 percent) was value added within these industries in Warren County. \$16.451 million of this value added was paid out as personal income.

Overall, Table 4 shows that exports from Warren County's agri-food industries accounted for 12.01 percent of the county's total output, 6.31 percent of total value added, and 1.50 percent of the county's personal income.

Table 5. Crop Statistics From the U.S. Census of Agriculture

	Warren County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold*	53,441	62,267	12,273,634	12,162,165
Value of Crops Sold*	34,776	40,654	6,071,272	6,381,676
Total Cropland Harvested (acres)	160,435	172,957	23,994,343	24,008,826
Corn for grain	66,197	72,773	11,761,392	11,930,542
Corn for silage and green-chop	1,518	1,450	247,269	244,913
Soybeans	65,000	71,157	10,418,621	10,258,681
Oats	901	1,275	143,513	214,485
Harvested forage crops	27,770	(NA)	1,533,027	(NA)
Bushels harvested				
Corn	9,917,719	9,499,440	1,851,276,224	1,581,093,092
Soybeans	2,911,014	3,099,515	487,380,897	459,309,682
Oats	60,207	74,898	10,761,952	14,451,930

\* Values are in \$1,000s

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that would accompany trying to separate local household consumption between that which consumes local food products and that which consumes food products imported from outside the county.

Table 5 shows Warren County crop inventories and sales for 1997 and 2002. State statistics are included for comparison. Table 6 provides similar information for Warren County livestock. Data in both tables comes from the US Census of Agriculture. In both tables “(NA)” entries denote categories where data was not collected or compiled, and “(D)” entries designate that data was collected but results were suppressed to comply with personal disclosure restrictions.

Table 6. Livestock Statistics From the U.S. Census of Agriculture

	Warren County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold	53,441	62,267	12,273,634	12,162,165
Value of Livestock and Livestock Products Sold*	18,665	21,613	6,202,362	5,780,489
<b>Hogs and Pigs</b>				
Total inventory	37,527	42,648	15,486,531	14,513,319
Inventory of breeding stock	3,245	4,579	1,145,323	1,354,166
Number sold	75,920	68,770	41,232,492	27,340,921
Value of sales*	5,506	7,851	3,078,455	3,012,764
<b>Cattle and Calves</b>				
Total inventory	34,428	40,391	3,535,945	3,717,394
Beef cows	16,197	18,725	987,670	1,051,178
Milk cows	246	480	206,965	222,090
Number sold	18,975	21,572	2,929,704	2,936,978
Value of sales*	11,858	11,836	2,119,935	1,886,416
Value of Dairy Products Sold*	591	778	442,431	407,897
<b>Poultry and Poultry Products</b>				
Value of sales*	(D)	4	511,949	414,587
Inventory of layers 20 weeks and older	826	664	38,650,210	21,514,768
Broiler and meat-type chicken inventory	139	735	1,730,091	1,023,349
Broiler and meat-type chickens sold	805	(D)	9,558,127	6,919,963
Turkey inventory	11	47	3,681,862	2,552,845
Turkeys sold	-	(D)	9,145,415	7,279,822
<b>Sheep and Goats and Related Products</b>				
Value of sales	98	(NA)	23,366	(NA)
Inventory of sheep and lambs	1,685	1,889	249,908	272,913
Number of sheep and lambs sold	1,153	2,455	257,130	326,868

\* Values are in \$1,000s

The first three data columns of Table 7 show aggregated annual earnings in thousands of dollars from farm employment, nonfarm employment, and totals employment in Warren County from 1990 through 2003. The values are not adjusted for inflation. Note that nonfarm earnings steadily rise throughout the period. Total earnings rise, but with somewhat more variation. Farm earnings swing significantly from year-to-year. This is typical of earnings in economies with a substantial ag production sector.

The final three data columns of Table 7 show the data again. In Table 7, however, the data is differenced year-by-year. Entries for 1991, for example, are the difference between, change from, 1990 to 1991. Positive numbers denote unadjusted growth. Negative numbers denote unadjusted decline. This representation shows that nonfarm earnings tend to be growing over time, causing total earnings to trend upward over time. The variability in this growth, however, is strongly associated with the variability of farm earnings. This is due to the weather and market factors that make production agriculture returns highly variable (which is also true of many basic mining industries).

While ag production's growth in most areas is limited by the availability of suitable land, its variability has a substantial effect upon rural areas. Even in urbanized areas, the difference between a good earnings year and a bad earnings year is often heavily influenced by conditions affecting agricultural production and marketing.

A more detailed state-level discussion and illustrations are included in the state report on pages 22 through 24.

Table 7. Annual Earnings and Annual Earnings Changes

Year	Annual County Earnings by Source			Annual Changes in County Earnings		
	Farm	Nonfarm	Total	Farm	Nonfarm	Total
1990	8,118	168,548	176,666	(NA)	(NA)	(NA)
1991	4,239	178,070	182,309	-3,879	9,522	5,643
1992	8,005	192,713	200,718	3,766	14,643	18,409
1993	-5,616	201,091	195,475	-13,621	8,378	-5,243
1994	11,227	212,298	223,525	16,843	11,207	28,050
1995	-2,200	224,218	222,018	-13,427	11,920	-1,507
1996	8,069	238,570	246,639	10,269	14,352	24,621
1997	16,027	250,581	266,608	7,958	12,011	19,969
1998	9,564	255,396	264,960	-6,463	4,815	-1,648
1999	4,091	278,222	282,313	-5,473	22,826	17,353
2000	7,000	294,937	301,937	2,909	16,715	19,624
2001	2,489	301,258	303,747	-4,511	6,321	1,810
2002	5,327	321,220	326,547	2,838	19,962	22,800
2003	2,814	345,754	348,568	-2,513	24,534	22,021

Data from the US Bureau of Economic Analysis