

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

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This summary report provides county-level statistics for Jefferson County, Iowa as a supplement to *The Economic Importance of Agri-food Industries in Iowa*¹ (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 Jefferson County had 808 farms in 2002. These farms averaged 289 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 Jefferson County was \$496,259 in 2002, compared to \$808,152 for Iowa and \$604,403, nationwide. In 2002, Jefferson County farms marketed an average of \$60,096 worth of farm products according to the US Census of Agriculture.

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

	Jefferson County		Iowa		United States	
	2002	1997	2002	1997	2002	1997
Number of farms	808	828	90,655	96,705	2,128,982	2,215,876
Land in farms (acres)	233,238	239,397	31,729,490	32,313,119	938,279,056	954,752,502
Average farm size (acres)	289	289	350	334	441	431
Market value, per farm, of						
Land and buildings (\$)	425,473	322,959	707,730	559,678	537,833	416,007
Machinery and equipment (\$)	70,786	48,809	100,422	79,607	66,570	53,861
Farm products sold (\$)	60,096	70,763	135,388	125,766	94,245	90,880

Table 2 shows employment data for Jefferson 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 states². 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 Jefferson County. Detail is restricted in this summary, due to the smaller employment base and privacy issues at the county level.

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

² 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)

	Jefferson County			Iowa	
	Jobs	As a percent of County total	State Category	Jobs	% of state total
Farm and closely-related	938	7.92	0.46	201,967	10.57
Peripherally-related	717	6.06	0.37	191,669	10.04
Total farm and farm-related	1,655	13.98	0.42	393,636	20.61
Total employment	11,839	100.00	0.62	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 Jefferson 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)³.

Table 3 provides value estimates for an industry-only aggregation of the economic activity that takes place within Jefferson 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 jobs⁴ and labor income (compensation for employees and proprietors) within the agri-food industries in Jefferson County.

Table 3 shows that, in 2002, the total output value of Jefferson County's agricultural production industry was \$46.238 million. \$16.141 million of this output (34.91 percent of the total output value) was the value added to the output by Jefferson 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). 48.03 percent of this value added, or \$7.753 million, was paid out as compensation to the 766 production agriculture jobs in Jefferson County.

³ 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.

⁴ 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

Jefferson County			Labor	Value-Added	
Agricultural Production	Output*	Jobs	Income*	Value*	Pct. Of Tot.
Oilseeds	9.479	116	3.108	5.096	0.99
Grain	15.393	284	3.614	6.971	1.35
Other Crops	3.561	18	0.627	1.824	0.35
Cattle	7.483	65	-0.035	0.542	0.11
Poultry	0.615	2	0.069	0.201	0.04
Hogs and Pigs	8.410	243	0.321	1.306	0.25
Other Ag Production	1.297	38	0.049	0.201	0.04
Sum of Ag Production	46.238	766	7.753	16.141	3.13
Primary Food Processing					
Crop	4.872	4	0.076	0.105	0.02
Dairy	0.000	0	0.000	0.000	0.00
Meat	1.359	4	0.066	0.080	0.02
Sum of Primary Food Proc.	6.231	8	0.142	0.185	0.04
Other Food/Ag Processing					
Animal and Pet Foods	0.000	0	0.000	0.000	0.00
Other Food Processing	2.856	13	0.355	0.586	0.11
Sum of Other Ag Proc.	2.856	13	0.355	0.586	0.11
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.000	0	0.000	0.000	0.00
Farm Machinery	23.901	40	13.441	15.115	2.94
Sum of Ag Input Mfg.	23.901	40	13.441	15.115	2.94
Sum of All Agri-food Ind.	79.226	827	21.691	32.027	6.22
NonAg Industries	856.761	10,105	317.388	482.913	93.78
Totals	935.987	10,932	339.079	514.940	100.00

* Numbers represent millions of dollars

If we add food and other ag processing and ag input manufacturing to agricultural production, the value of Jefferson County's agri-food industry output was \$79.226 million, or 8.46 percent of Jefferson County's total industrial production. Of this, \$32.027 million (40.42 percent) was value added within these industries in Jefferson County. \$21.691 million of this value added was paid out as wages and salaries to the 827 agri-food industry jobs in the county.

Overall, Table 3 shows that Jefferson County's agri-food industries directly accounted for 8.46 percent of the county's total output, 6.22 percent of total value added, 6.40 percent of labor income, and 7.57 percent of the county's jobs⁵.

⁵ 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

Jefferson County	Value Added				
	As a Percent of				
				Total V.A.	Nonhousehold Demand
Agricultural Production	Output*	Income*	Value Added*		
Oilseeds	10.177	3.882	5.773	1.12	1.23
Grain	18.586	5.867	9.273	1.80	1.97
Other Crops	0.875	0.263	0.474	0.09	0.10
Cattle	9.707	1.133	2.301	0.45	0.49
Poultry	0.509	0.113	0.198	0.04	0.04
Hogs and Pigs	11.689	1.771	3.367	0.65	0.72
Other Ag Production	1.802	0.273	0.519	0.10	0.11
Sum of Ag Production	53.346	13.303	21.906	4.25	4.66
Primary Food Processing					
Crop	8.821	1.588	2.460	0.48	0.52
Dairy	0.000	0.000	0.000	0.00	0.00
Meat	0.825	0.086	0.154	0.03	0.03
Sum of Primary Food Proc.	9.645	1.675	2.614	0.51	0.56
Other Food/Ag Processing					
Animal and Pet Foods	0.000	0.000	0.000	0.00	0.00
Other Food Processing	2.661	0.519	0.848	0.16	0.18
Sum of Other Ag Proc.	2.661	0.519	0.848	0.16	0.18
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.000	0.000	0.000	0.00	0.00
Farm Machinery	33.543	16.896	21.078	4.09	4.49
Sum of Ag Input Mfg.	33.543	16.896	21.078	4.09	4.49
Sum of All Agri-food Ind.	99.196	32.393	46.446	9.02	9.88
NonAg Industries	765.560	286.723	423.422	82.23	90.12
Household Consumption	71.231	160.646	45.071	8.75	9.59
Totals	935.987	479.762	514.940	100.00	109.59

* 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 produced⁶. 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 sales⁷.

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

⁷ 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 Jefferson County's agricultural production industry was \$53.346 million. \$21.906 million of this output (41.06 percent of the total output value) was the value added to the output by economic activity within Jefferson County (value added). The remainder came from inputs purchased from out-of-county sources. 60.73 percent of this value added, or \$13.303 million, was paid out as personal income to residents of Jefferson 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 Jefferson County's agri-food industry output was \$99.196 million, or 10.60 percent of Jefferson County's total industrial production. Of this, \$46.446 million (46.82 percent) was value added within these industries in Jefferson County. \$32.393 million of this value added was paid out as personal income.

Overall, Table 4 shows that exports from Jefferson County's agri-food industries accounted for 10.60 percent of the county's total output, 9.02 percent of total value added, and 6.75 percent of the county's personal income.

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

	Jefferson County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold*	48,558	58,592	12,273,634	12,162,165
Value of Crops Sold*	26,516	35,948	6,071,272	6,381,676
Total Cropland Harvested (acres)	135,215	142,547	23,994,343	24,008,826
Corn for grain	59,126	63,347	11,761,392	11,930,542
Corn for silage and green-chop	1,312	617	247,269	244,913
Soybeans	56,239	63,792	10,418,621	10,258,681
Oats	1,523	1,815	143,513	214,485
Harvested forage crops	15,386	(NA)	1,533,027	(NA)
Bushels harvested				
Corn	7,668,133	8,254,932	1,851,276,224	1,581,093,092
Soybeans	2,044,872	2,845,794	487,380,897	459,309,682
Oats	84,813	106,302	10,761,952	14,451,930

* Values are in \$1,000s

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 Jefferson County crop inventories and sales for 1997 and 2002. State statistics are included for comparison. Table 6 provides similar information for Jefferson 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

	Jefferson County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold	48,558	58,592	12,273,634	12,162,165
Value of Livestock and Livestock Products Sold*	22,041	22,644	6,202,362	5,780,489
Hogs and Pigs				
Total inventory	57,933	73,019	15,486,531	14,513,319
Inventory of breeding stock	4,206	6,751	1,145,323	1,354,166
Number sold	183,270	142,716	41,232,492	27,340,921
Value of sales*	13,017	13,965	3,078,455	3,012,764
Cattle and Calves				
Total inventory	20,616	20,699	3,535,945	3,717,394
Beef cows	(D)	8,673	987,670	1,051,178
Milk cows	(D)	544	206,965	222,090
Number sold	11,584	12,398	2,929,704	2,936,978
Value of sales*	7,226	6,370	2,119,935	1,886,416
Value of Dairy Products Sold*	(D)	932	442,431	407,897
Poultry and Poultry Products				
Value of sales*	4	7	511,949	414,587
Inventory of layers 20 weeks and older	778	888	38,650,210	21,514,768
Broiler and meat-type chicken inventory	(D)	201	1,730,091	1,023,349
Broiler and meat-type chickens sold	686	(D)	9,558,127	6,919,963
Turkey inventory	(D)	(D)	3,681,862	2,552,845
Turkeys sold	(D)	-	9,145,415	7,279,822
Sheep and Goats and Related Products				
Value of sales	1,364	(NA)	23,366	(NA)
Inventory of sheep and lambs	13,687	9,687	249,908	272,913
Number of sheep and lambs sold	15,286	11,813	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 Jefferson 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	14,550	186,113	200,663	(NA)	(NA)	(NA)
1991	10,890	190,917	201,807	-3,660	4,804	1,144
1992	14,465	221,511	235,976	3,575	30,594	34,169
1993	6,521	225,697	232,218	-7,944	4,186	-3,758
1994	19,187	239,512	258,699	12,666	13,815	26,481
1995	4,551	249,034	253,585	-14,636	9,522	-5,114
1996	17,651	270,166	287,817	13,100	21,132	34,232
1997	20,806	316,858	337,664	3,155	46,692	49,847
1998	12,618	334,549	347,167	-8,188	17,691	9,503
1999	4,177	319,617	323,794	-8,441	-14,932	-23,373
2000	11,069	334,961	346,030	6,892	15,344	22,236
2001	7,737	306,978	314,715	-3,332	-27,983	-31,315
2002	6,197	297,399	303,596	-1,540	-9,579	-11,119
2003	9,784	299,427	309,211	3,587	2,028	5,615

Data from the US Bureau of Economic Analysis