

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

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This summary report provides county-level statistics for Delaware 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 Delaware County had 1,253 farms in 2002. These farms averaged 276 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 Delaware County was \$792,182 in 2002, compared to \$808,152 for Iowa and \$604,403, nationwide. In 2002, Delaware County farms marketed an average of \$151,863 worth of farm products according to the US Census of Agriculture.

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

	Delaware County		Iowa		United States	
	2002	1997	2002	1997	2002	1997
Number of farms	1,253	1,318	90,655	96,705	2,128,982	2,215,876
Land in farms (acres)	345,238	328,742	31,729,490	32,313,119	938,279,056	954,752,502
Average farm size (acres)	276	249	350	334	441	431
Market value, per farm, of						
Land and buildings (\$)	676,998	445,882	707,730	559,678	537,833	416,007
Machinery and equipment (\$)	115,184	89,386	100,422	79,607	66,570	53,861
Farm products sold (\$)	151,863	146,812	135,388	125,766	94,245	90,880

Table 2 shows employment data for Delaware 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 Delaware 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)

	Delaware County			Iowa	
	Jobs	As a percent of County total	State Category	Jobs	% of state total
Farm and closely-related	1,740	16.61	0.86	201,967	10.57
Peripherally-related	537	5.13	0.28	191,669	10.04
Total farm and farm-related	2,277	21.74	0.58	393,636	20.61
Total employment	10,473	100.00	0.55	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 Delaware 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 Delaware 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 Delaware County.

Table 3 shows that, in 2002, the total output value of Delaware County's agricultural production industry was \$181.114 million. \$54.354 million of this output (30.01 percent of the total output value) was the value added to the output by Delaware 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). 51.56 percent of this value added, or \$28.026 million, was paid out as compensation to the 1,899 production agriculture jobs in Delaware 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

Delaware County		Labor		Value-Added	
Agricultural Production	Output*	Jobs	Income*	Value*	Pct. Of Tot.
Oilseeds	19.545	150	6.414	10.508	2.71
Grain	52.970	611	12.509	23.988	6.18
Other Crops	10.516	32	1.956	5.456	1.41
Cattle	47.355	257	-0.068	3.410	0.88
Poultry	0.434	1	0.051	0.142	0.04
Hogs and Pigs	25.703	465	1.167	3.991	1.03
Other Ag Production	24.591	383	5.997	6.859	1.77
Sum of Ag Production	181.114	1,899	28.026	54.354	14.00
Primary Food Processing					
Crop	0.000	0	0.000	0.000	0.00
Dairy	0.562	2	0.027	0.034	0.01
Meat	1.104	4	0.070	0.083	0.02
Sum of Primary Food Proc.	1.666	6	0.097	0.117	0.03
Other Food/Ag Processing					
Animal and Pet Foods	6.374	12	0.547	0.778	0.20
Other Food Processing	0.000	0	0.000	0.000	0.00
Sum of Other Ag Proc.	6.374	12	0.547	0.778	0.20
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.565	3	0.089	0.215	0.06
Farm Machinery	1.176	5	0.235	0.393	0.10
Sum of Ag Input Mfg.	1.741	8	0.324	0.608	0.16
Sum of All Agri-food Ind.	190.895	1,925	28.994	55.857	14.39
NonAg Industries	667.898	6,996	222.431	332.317	85.61
Totals	858.793	8,921	251.425	388.174	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 Delaware County's agri-food industry output was \$190.895 million, or 22.23 percent of Delaware County's total industrial production. Of this, \$55.857 million (29.26 percent) was value added within these industries in Delaware County. \$28.994 million of this value added was paid out as wages and salaries to the 1,925 agri-food industry jobs in the county.

Overall, Table 3 shows that Delaware County's agri-food industries directly accounted for 22.23 percent of the county's total output, 14.39 percent of total value added, 11.53 percent of labor income, and 21.58 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

Delaware County	Value Added				
	As a Percent of				
	Nonhousehold				
Agricultural Production	Output*	Income*	Value Added*	Total V.A.	Demand
Oilseeds	25.297	10.114	14.136	3.64	4.21
Grain	61.938	20.972	30.444	7.84	9.06
Other Crops	1.114	0.371	0.602	0.16	0.18
Cattle	63.771	7.575	13.336	3.44	3.97
Poultry	0.403	0.095	0.153	0.04	0.05
Hogs and Pigs	34.731	5.495	9.239	2.38	2.75
Other Ag Production	23.979	3.936	6.489	1.67	1.93
Sum of Ag Production	211.234	48.557	74.400	19.17	22.15
Primary Food Processing					
Crop	0.000	0.000	0.000	0.00	0.00
Dairy	0.362	0.036	0.057	0.01	0.02
Meat	0.479	0.054	0.083	0.02	0.02
Sum of Primary Food Proc.	0.841	0.089	0.140	0.04	0.04
Other Food/Ag Processing					
Animal and Pet Foods	8.309	1.348	1.946	0.50	0.58
Other Food Processing	0.000	0.000	0.000	0.00	0.00
Sum of Other Ag Proc.	8.309	1.348	1.946	0.50	0.58
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.165	0.044	0.071	0.02	0.02
Farm Machinery	0.972	0.257	0.379	0.10	0.11
Sum of Ag Input Mfg.	1.137	0.301	0.449	0.12	0.13
Sum of All Agri-food Ind.	221.522	50.295	76.935	19.82	22.91
NonAg Industries	557.657	191.437	258.948	66.71	77.09
Household Consumption	79.614	225.037	52.291	13.47	15.57
Totals	858.793	466.769	388.174	100.00	115.57

* 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 Delaware County's agricultural production industry was \$211.234 million. \$74.400 million of this output (35.22 percent of the total output value) was the value added to the output by economic activity within Delaware County (value added). The remainder came from inputs purchased from out-of-county sources. 65.26 percent of this value added, or \$48.557 million, was paid out as personal income to residents of Delaware 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 Delaware County's agri-food industry output was \$221.522 million, or 25.79 percent of Delaware County's total industrial production. Of this, \$76.935 million (34.73 percent) was value added within these industries in Delaware County. \$50.295 million of this value added was paid out as personal income.

Overall, Table 4 shows that exports from Delaware County's agri-food industries accounted for 25.79 percent of the county's total output, 19.82 percent of total value added, and 10.78 percent of the county's personal income.

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

	Delaware County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold*	190,284	193,499	12,273,634	12,162,165
Value of Crops Sold*	62,961	51,800	6,071,272	6,381,676
Total Cropland Harvested (acres)	271,184	258,649	23,994,343	24,008,826
Corn for grain	154,494	156,722	11,761,392	11,930,542
Corn for silage and green-chop	7,802	9,010	247,269	244,913
Soybeans	81,634	59,993	10,418,621	10,258,681
Oats	3,880	6,165	143,513	214,485
Harvested forage crops	26,485	(NA)	1,533,027	(NA)
Bushels harvested				
Corn	26,848,909	21,570,425	1,851,276,224	1,581,093,092
Soybeans	4,216,376	3,047,920	487,380,897	459,309,682
Oats	303,106	402,129	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 Delaware County crop inventories and sales for 1997 and 2002. State statistics are included for comparison. Table 6 provides similar information for Delaware 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

	Delaware County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold	190,284	193,499	12,273,634	12,162,165
Value of Livestock and Livestock Products Sold*	127,323	141,698	6,202,362	5,780,489
Hogs and Pigs				
Total inventory	294,519	389,058	15,486,531	14,513,319
Inventory of breeding stock	23,040	39,818	1,145,323	1,354,166
Number sold	657,774	635,500	41,232,492	27,340,921
Value of sales*	50,730	75,346	3,078,455	3,012,764
Cattle and Calves				
Total inventory	75,243	70,147	3,535,945	3,717,394
Beef cows	7,437	7,929	987,670	1,051,178
Milk cows	15,004	18,691	206,965	222,090
Number sold	62,327	45,604	2,929,704	2,936,978
Value of sales*	45,730	30,708	2,119,935	1,886,416
Value of Dairy Products Sold*	30,198	34,890	442,431	407,897
Poultry and Poultry Products				
Value of sales*	4	(D)	511,949	414,587
Inventory of layers 20 weeks and older	1,079	(D)	38,650,210	21,514,768
Broiler and meat-type chicken inventory	(D)	258	1,730,091	1,023,349
Broiler and meat-type chickens sold	201	265	9,558,127	6,919,963
Turkey inventory	(D)	22	3,681,862	2,552,845
Turkeys sold	(D)	(D)	9,145,415	7,279,822
Sheep and Goats and Related Products				
Value of sales	142	(NA)	23,366	(NA)
Inventory of sheep and lambs	1,102	1,031	249,908	272,913
Number of sheep and lambs sold	691	858	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 Delaware 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	49,617	125,957	175,574	(NA)	(NA)	(NA)
1991	34,709	129,605	164,314	-14,908	3,648	-11,260
1992	47,877	133,197	181,074	13,168	3,592	16,760
1993	28,490	142,697	171,187	-19,387	9,500	-9,887
1994	46,516	150,683	197,199	18,026	7,986	26,012
1995	27,203	158,298	185,501	-19,313	7,615	-11,698
1996	64,986	165,276	230,262	37,783	6,978	44,761
1997	60,770	182,321	243,091	-4,216	17,045	12,829
1998	40,371	191,526	231,897	-20,399	9,205	-11,194
1999	26,060	197,897	223,957	-14,311	6,371	-7,940
2000	38,574	208,744	247,318	12,514	10,847	23,361
2001	36,907	214,241	251,148	-1,667	5,497	3,830
2002	28,264	216,969	245,233	-8,643	2,728	-5,915
2003	21,258	233,221	254,479	-7,006	16,252	9,246

Data from the US Bureau of Economic Analysis