

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

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This summary report provides county-level statistics for Davis 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 Davis County had 1,007 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 Davis County was \$366,173 in 2002, compared to \$808,152 for Iowa and \$604,403, nationwide. In 2002, Davis County farms marketed an average of \$49,293 worth of farm products according to the US Census of Agriculture.

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

	Davis County		Iowa		United States	
	2002	1997	2002	1997	2002	1997
Number of farms	1,007	964	90,655	96,705	2,128,982	2,215,876
Land in farms (acres)	290,887	279,239	31,729,490	32,313,119	938,279,056	954,752,502
Average farm size (acres)	289	290	350	334	441	431
Market value, per farm, of						
Land and buildings (\$)	321,559	243,615	707,730	559,678	537,833	416,007
Machinery and equipment (\$)	44,614	37,309	100,422	79,607	66,570	53,861
Farm products sold (\$)	49,293	59,136	135,388	125,766	94,245	90,880

Table 2 shows employment data for Davis 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 Davis 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)

	Davis County			Iowa	
	Jobs	County total	As a percent of State Category	Jobs	% of state total
Farm and closely-related	988	22.59	0.49	201,967	10.57
Peripherally-related	228	5.22	0.12	191,669	10.04
Total farm and farm-related	1,217	27.80	0.31	393,636	20.61
Total employment	4,376	100.00	0.23	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 Davis 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 Davis 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 Davis County.

Table 3 shows that, in 2002, the total output value of Davis County's agricultural production industry was \$52.304 million. \$16.647 million of this output (31.83 percent of the total output value) was the value added to the output by Davis 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). 44.79 percent of this value added, or \$7.457 million, was paid out as compensation to the 711 production agriculture jobs in Davis 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

Davis County			Labor	Value-Added	
Agricultural Production	Output*	Jobs	Income*	Value*	Pct. Of Tot.
Oilseeds	8.273	101	2.718	4.448	3.46
Grain	10.140	187	2.405	4.592	3.58
Other Crops	10.205	50	1.900	5.217	4.06
Cattle	15.417	134	0.015	1.106	0.86
Poultry	0.000	0	0.000	0.000	0.00
Hogs and Pigs	5.226	151	0.265	0.812	0.63
Other Ag Production	3.043	88	0.154	0.472	0.37
Sum of Ag Production	52.304	711	7.457	16.647	12.96
Primary Food Processing					
Crop	0.000	0	0.000	0.000	0.00
Dairy	0.000	0	0.000	0.000	0.00
Meat	0.000	0	0.000	0.000	0.00
Sum of Primary Food Proc.	0.000	0	0.000	0.000	0.00
Other Food/Ag Processing					
Animal and Pet Foods	0.000	0	0.000	0.000	0.00
Other Food Processing	0.000	0	0.000	0.000	0.00
Sum of Other Ag Proc.	0.000	0	0.000	0.000	0.00
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.000	0	0.000	0.000	0.00
Farm Machinery	0.000	0	0.000	0.000	0.00
Sum of Ag Input Mfg.	0.000	0	0.000	0.000	0.00
Sum of All Agri-food Ind.	52.304	711	7.457	16.647	12.96
NonAg Industries	199.070	2,559	70.499	111.753	87.04
Totals	251.374	3,270	77.956	128.400	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 Davis County's agri-food industry output was \$52.304 million, or 20.81 percent of Davis County's total industrial production. Of this, \$16.647 million (31.83 percent) was value added within these industries in Davis County. \$7.457 million of this value added was paid out as wages and salaries to the 711 agri-food industry jobs in the county.

Overall, Table 3 shows that Davis County's agri-food industries directly accounted for 20.81 percent of the county's total output, 12.96 percent of total value added, 9.57 percent of labor income, and 21.74 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

Davis County	Output*	Income*	Value Added*	Value Added As a Percent of Nonhousehold Demand	
				Total V.A.	Demand
Agricultural Production					
Oilseeds	10.258	3.979	5.774	4.50	5.66
Grain	10.841	3.446	5.309	4.13	5.20
Other Crops	6.822	2.097	3.657	2.85	3.58
Cattle	22.314	2.683	5.127	3.99	5.02
Poultry	0.000	0.000	0.000	0.00	0.00
Hogs and Pigs	7.362	1.150	2.065	1.61	2.02
Other Ag Production	4.286	0.670	1.202	0.94	1.18
Sum of Ag Production	61.883	14.025	23.135	18.02	22.67
Primary Food Processing					
Crop	0.000	0.000	0.000	0.00	0.00
Dairy	0.000	0.000	0.000	0.00	0.00
Meat	0.000	0.000	0.000	0.00	0.00
Sum of Primary Food Proc.	0.000	0.000	0.000	0.00	0.00
Other Food/Ag Processing					
Animal and Pet Foods	0.000	0.000	0.000	0.00	0.00
Other Food Processing	0.000	0.000	0.000	0.00	0.00
Sum of Other Ag Proc.	0.000	0.000	0.000	0.00	0.00
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.000	0.000	0.000	0.00	0.00
Farm Machinery	0.000	0.000	0.000	0.00	0.00
Sum of Ag Input Mfg.	0.000	0.000	0.000	0.00	0.00
Sum of All Agri-food Ind.	61.883	14.025	23.135	18.02	22.67
NonAg Industries	149.810	55.251	78.910	61.46	77.33
Household Consumption	39.681	113.687	26.355	20.53	25.83
Totals	251.374	182.963	128.400	100.00	125.83

* 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 Davis County's agricultural production industry was \$61.883 million. \$23.135 million of this output (37.38 percent of the total output value) was the value added to the output by economic activity within Davis County (value added). The remainder came from inputs purchased from out-of-county sources. 60.62 percent of this value added, or \$14.025 million, was paid out as personal income to residents of Davis 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 Davis County's agri-food industry output was \$61.883 million, or 24.62 percent of Davis County's total industrial production. Of this, \$23.135 million (37.38 percent) was value added within these industries in Davis County. \$14.025 million of this value added was paid out as personal income.

Overall, Table 4 shows that exports from Davis County's agri-food industries accounted for 24.62 percent of the county's total output, 18.02 percent of total value added, and 7.67 percent of the county's personal income.

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

	Davis County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold*	49,638	57,008	12,273,634	12,162,165
Value of Crops Sold*	20,540	18,845	6,071,272	6,381,676
Total Cropland Harvested (acres)	128,895	113,877	23,994,343	24,008,826
Corn for grain	39,467	34,692	11,761,392	11,930,542
Corn for silage and green-chop	2,183	1,180	247,269	244,913
Soybeans	45,282	39,211	10,418,621	10,258,681
Oats	1,480	2,014	143,513	214,485
Harvested forage crops	43,404	(NA)	1,533,027	(NA)
Bushels harvested				
Corn	5,043,653	4,086,037	1,851,276,224	1,581,093,092
Soybeans	1,779,175	1,733,117	487,380,897	459,309,682
Oats	86,231	105,806	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 Davis County crop inventories and sales for 1997 and 2002. State statistics are included for comparison. Table 6 provides similar information for Davis 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

	Davis County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold	49,638	57,008	12,273,634	12,162,165
Value of Livestock and Livestock Products Sold*	29,098	38,162	6,202,362	5,780,489
Hogs and Pigs				
Total inventory	47,042	123,933	15,486,531	14,513,319
Inventory of breeding stock	3,263	13,415	1,145,323	1,354,166
Number sold	135,963	157,684	41,232,492	27,340,921
Value of sales*	9,335	21,483	3,078,455	3,012,764
Cattle and Calves				
Total inventory	47,894	49,168	3,535,945	3,717,394
Beef cows	22,907	21,778	987,670	1,051,178
Milk cows	2,149	1,948	206,965	222,090
Number sold	26,470	27,098	2,929,704	2,936,978
Value of sales*	14,888	12,579	2,119,935	1,886,416
Value of Dairy Products Sold*	4,120	3,072	442,431	407,897
Poultry and Poultry Products				
Value of sales*	17	122	511,949	414,587
Inventory of layers 20 weeks and older	1,505	11,313	38,650,210	21,514,768
Broiler and meat-type chicken inventory	976	558	1,730,091	1,023,349
Broiler and meat-type chickens sold	2,657	(D)	9,558,127	6,919,963
Turkey inventory	39	21	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	381	(NA)	23,366	(NA)
Inventory of sheep and lambs	5,512	7,841	249,908	272,913
Number of sheep and lambs sold	6,723	7,470	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 Davis 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	7,999	50,430	58,429	(NA)	(NA)	(NA)
1991	4,667	52,592	57,259	-3,332	2,162	-1,170
1992	8,271	56,172	64,443	3,604	3,580	7,184
1993	2,649	60,740	63,389	-5,622	4,568	-1,054
1994	7,876	65,008	72,884	5,227	4,268	9,495
1995	-1,763	65,774	64,011	-9,639	766	-8,873
1996	11,544	67,069	78,613	13,307	1,295	14,602
1997	13,137	71,098	84,235	1,593	4,029	5,622
1998	7,613	77,858	85,471	-5,524	6,760	1,236
1999	4,124	80,717	84,841	-3,489	2,859	-630
2000	9,626	83,983	93,609	5,502	3,266	8,768
2001	5,361	79,973	85,334	-4,265	-4,010	-8,275
2002	6,185	81,716	87,901	824	1,743	2,567
2003	4,516	86,267	90,783	-1,669	4,551	2,882

Data from the US Bureau of Economic Analysis