

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

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 By Mark Imerman, David Swenson, Liesl Eathington, and Daniel Otto
 Iowa State University Department of Economics
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This summary report provides county-level statistics for Mahaska 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 Mahaska County had 1,043 farms in 2002. These farms averaged 315 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 Mahaska County was \$767,638 in 2002, compared to \$808,152 for Iowa and \$604,403, nationwide. In 2002, Mahaska County farms marketed an average of \$127,275 worth of farm products according to the US Census of Agriculture.

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

	Mahaska County		Iowa		United States	
	2002	1997	2002	1997	2002	1997
Number of farms	1,043	1,083	90,655	96,705	2,128,982	2,215,876
Land in farms (acres)	328,579	334,487	31,729,490	32,313,119	938,279,056	954,752,502
Average farm size (acres)	315	309	350	334	441	431
Market value, per farm, of						
Land and buildings (\$)	675,409	451,048	707,730	559,678	537,833	416,007
Machinery and equipment (\$)	92,229	70,762	100,422	79,607	66,570	53,861
Farm products sold (\$)	127,275	145,292	135,388	125,766	94,245	90,880

Table 2 shows employment data for Mahaska 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 Mahaska 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)

	Mahaska County			Iowa	
	Jobs	County total	As a percent of State Category	Jobs	% of state total
Farm and closely-related	1,544	13.00	0.76	201,967	10.57
Peripherally-related	963	8.11	0.50	191,669	10.04
Total farm and farm-related	2,507	21.11	0.64	393,636	20.61
Total employment	11,872	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 Mahaska 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 Mahaska 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 Mahaska County.

Table 3 shows that, in 2002, the total output value of Mahaska County's agricultural production industry was \$132.527 million. \$40.751 million of this output (30.75 percent of the total output value) was the value added to the output by Mahaska 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). 55.23 percent of this value added, or \$22.506 million, was paid out as compensation to the 1,511 production agriculture jobs in Mahaska 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

Mahaska County		Labor		Value-Added	
Agricultural Production	Output*	Jobs	Income*	Value*	Pct. Of Tot.
Oilseeds	21.765	177	7.182	11.702	2.54
Grain	36.492	447	8.888	16.526	3.59
Other Crops	4.030	13	0.886	2.120	0.46
Cattle	30.601	178	0.482	2.143	0.46
Poultry	6.862	11	0.945	2.240	0.49
Hogs and Pigs	26.194	503	2.183	4.068	0.88
Other Ag Production	6.583	182	1.940	1.952	0.42
Sum of Ag Production	132.527	1,511	22.506	40.751	8.84
Primary Food Processing					
Crop	45.186	38	1.964	2.732	0.59
Dairy	3.528	9	0.218	0.740	0.16
Meat	2.749	11	0.370	0.565	0.12
Sum of Primary Food Proc.	51.463	58	2.552	4.037	0.88
Other Food/Ag Processing					
Animal and Pet Foods	1.561	3	0.063	0.089	0.02
Other Food Processing	42.465	153	5.060	8.411	1.82
Sum of Other Ag Proc.	44.026	156	5.123	8.500	1.84
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.000	0	0.000	0.000	0.00
Farm Machinery	15.282	53	4.855	6.236	1.35
Sum of Ag Input Mfg.	15.282	53	4.855	6.236	1.35
Sum of All Agri-food Ind.	243.298	1,778	35.036	59.524	12.91
NonAg Industries	705.602	9,155	258.339	401.410	87.09
Totals	948.900	10,933	293.375	460.934	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 Mahaska County's agri-food industry output was \$243.298 million, or 25.64 percent of Mahaska County's total industrial production. Of this, \$59.524 million (24.47 percent) was value added within these industries in Mahaska County. \$35.036 million of this value added was paid out as wages and salaries to the 1,778 agri-food industry jobs in the county.

Overall, Table 3 shows that Mahaska County's agri-food industries directly accounted for 25.64 percent of the county's total output, 12.91 percent of total value added, 11.94 percent of labor income, and 16.26 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

Mahaska County	Value Added				
	As a Percent of				
				Total V.A.	Nonhousehold Demand
Agricultural Production	Output*	Income*	Value Added*		
Oilseeds	14.985	5.999	8.396	1.82	2.23
Grain	42.557	14.464	21.005	4.56	5.58
Other Crops	0.520	0.181	0.285	0.06	0.08
Cattle	36.864	4.178	7.182	1.56	1.91
Poultry	5.746	1.410	2.181	0.47	0.58
Hogs and Pigs	33.757	5.674	8.828	1.92	2.35
Other Ag Production	6.012	1.012	1.573	0.34	0.42
Sum of Ag Production	140.441	32.918	49.450	10.73	13.14
Primary Food Processing					
Crop	69.250	11.703	17.010	3.69	4.52
Dairy	4.177	0.645	1.091	0.24	0.29
Meat	1.403	0.237	0.353	0.08	0.09
Sum of Primary Food Proc.	74.830	12.585	18.455	4.00	4.90
Other Food/Ag Processing					
Animal and Pet Foods	2.108	0.270	0.391	0.08	0.10
Other Food Processing	54.525	10.515	15.501	3.36	4.12
Sum of Other Ag Proc.	56.634	10.785	15.892	3.45	4.22
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.000	0.000	0.000	0.00	0.00
Farm Machinery	19.495	6.838	8.893	1.93	2.36
Sum of Ag Input Mfg.	19.495	6.838	8.893	1.93	2.36
Sum of All Agri-food Ind.	291.400	63.126	92.690	20.11	24.63
NonAg Industries	523.411	208.277	283.626	61.53	75.37
Household Consumption	134.089	329.050	84.618	18.36	22.49
Totals	948.900	600.454	460.934	100.00	122.49

* 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 Mahaska County's agricultural production industry was \$140.441 million. \$49.450 million of this output (35.21 percent of the total output value) was the value added to the output by economic activity within Mahaska County (value added). The remainder came from inputs purchased from out-of-county sources. 66.57 percent of this value added, or \$32.918 million, was paid out as personal income to residents of Mahaska 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 Mahaska County's agri-food industry output was \$291.400 million, or 30.71 percent of Mahaska County's total industrial production. Of this, \$92.690 million (31.81 percent) was value added within these industries in Mahaska County. \$63.126 million of this value added was paid out as personal income.

Overall, Table 4 shows that exports from Mahaska County's agri-food industries accounted for 30.71 percent of the county's total output, 20.11 percent of total value added, and 10.51 percent of the county's personal income.

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

	Mahaska County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold*	132,748	157,351	12,273,634	12,162,165
Value of Crops Sold*	55,802	60,422	6,071,272	6,381,676
Total Cropland Harvested (acres)	231,055	231,022	23,994,343	24,008,826
Corn for grain	116,121	117,874	11,761,392	11,930,542
Corn for silage and green-chop	1,794	2,641	247,269	244,913
Soybeans	100,829	95,498	10,418,621	10,258,681
Oats	1,200	2,345	143,513	214,485
Harvested forage crops	12,471	(NA)	1,533,027	(NA)
Bushels harvested				
Corn	18,748,492	15,985,077	1,851,276,224	1,581,093,092
Soybeans	4,695,297	4,618,933	487,380,897	459,309,682
Oats	90,520	169,686	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 Mahaska County crop inventories and sales for 1997 and 2002. State statistics are included for comparison. Table 6 provides similar information for Mahaska 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

	Mahaska County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold	132,748	157,351	12,273,634	12,162,165
Value of Livestock and Livestock Products Sold*	76,946	96,930	6,202,362	5,780,489
Hogs and Pigs				
Total inventory	207,651	244,824	15,486,531	14,513,319
Inventory of breeding stock	19,090	33,514	1,145,323	1,354,166
Number sold	534,038	507,267	41,232,492	27,340,921
Value of sales*	39,749	60,105	3,078,455	3,012,764
Cattle and Calves				
Total inventory	39,209	41,970	3,535,945	3,717,394
Beef cows	9,695	10,465	987,670	1,051,178
Milk cows	615	1,016	206,965	222,090
Number sold	39,284	38,135	2,929,704	2,936,978
Value of sales*	29,551	24,634	2,119,935	1,886,416
Value of Dairy Products Sold*	(D)	1,823	442,431	407,897
Poultry and Poultry Products				
Value of sales*	(D)	(D)	511,949	414,587
Inventory of layers 20 weeks and older	(D)	(D)	38,650,210	21,514,768
Broiler and meat-type chicken inventory	44	(D)	1,730,091	1,023,349
Broiler and meat-type chickens sold	-	(D)	9,558,127	6,919,963
Turkey inventory	(D)	-	3,681,862	2,552,845
Turkeys sold	-	-	9,145,415	7,279,822
Sheep and Goats and Related Products				
Value of sales	176	(NA)	23,366	(NA)
Inventory of sheep and lambs	2,595	2,465	249,908	272,913
Number of sheep and lambs sold	2,178	1,928	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 Mahaska 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	29,208	155,503	184,711	(NA)	(NA)	(NA)
1991	24,760	155,794	180,554	-4,448	291	-4,157
1992	27,503	168,903	196,406	2,743	13,109	15,852
1993	16,147	174,538	190,685	-11,356	5,635	-5,721
1994	33,761	182,818	216,579	17,614	8,280	25,894
1995	20,673	188,035	208,708	-13,088	5,217	-7,871
1996	39,584	196,854	236,438	18,911	8,819	27,730
1997	48,168	213,184	261,352	8,584	16,330	24,914
1998	25,309	252,496	277,805	-22,859	39,312	16,453
1999	13,285	273,392	286,677	-12,024	20,896	8,872
2000	21,982	261,274	283,256	8,697	-12,118	-3,421
2001	15,058	267,013	282,071	-6,924	5,739	-1,185
2002	15,159	272,422	287,581	101	5,409	5,510
2003	11,672	287,199	298,871	-3,487	14,777	11,290

Data from the US Bureau of Economic Analysis