

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

Report prepared with funding from the Coalition to Support Iowa's Farmers
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 September 23, 2005

This summary report provides county-level statistics for Boone 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 Boone County had 827 farms in 2002. These farms averaged 378 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 Boone County was \$1,065,019 in 2002, compared to \$808,152 for Iowa and \$604,403, nationwide. In 2002, Boone County farms marketed an average of \$128,093 worth of farm products according to the US Census of Agriculture.

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

	Boone County		Iowa		United States	
	2002	1997	2002	1997	2002	1997
Number of farms	827	920	90,655	96,705	2,128,982	2,215,876
Land in farms (acres)	312,708	342,552	31,729,490	32,313,119	938,279,056	954,752,502
Average farm size (acres)	378	372	350	334	441	431
Market value, per farm, of						
Land and buildings (\$)	936,262	761,493	707,730	559,678	537,833	416,007
Machinery and equipment (\$)	128,757	96,807	100,422	79,607	66,570	53,861
Farm products sold (\$)	128,093	134,287	135,388	125,766	94,245	90,880

Table 2 shows employment data for Boone 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 Boone 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)

	Boone County			Iowa	
	Jobs	As a percent of County total	State Category	Jobs	% of state total
Farm and closely-related	1,019	7.42	0.50	201,967	10.57
Peripherally-related	1,377	10.02	0.72	191,669	10.04
Total farm and farm-related	2,396	17.44	0.61	393,636	20.61
Total employment	13,740	100.00	0.72	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 Boone 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 Boone 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 Boone County.

Table 3 shows that, in 2002, the total output value of Boone County's agricultural production industry was \$109.016 million. \$42.050 million of this output (38.57 percent of the total output value) was the value added to the output by Boone 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). 60.18 percent of this value added, or \$25.306 million, was paid out as compensation to the 1,094 production agriculture jobs in Boone 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

Boone County		Labor		Value-Added	
Agricultural Production	Output*	Jobs	Income*	Value*	Pct. Of Tot.
Oilseeds	25.842	216	8.610	13.894	2.23
Grain	44.598	561	11.457	20.197	3.25
Other Crops	3.876	17	1.471	2.513	0.40
Cattle	16.298	96	0.761	1.083	0.17
Poultry	8.795	15	1.550	2.871	0.46
Hogs and Pigs	8.155	160	1.237	1.267	0.20
Other Ag Production	1.452	29	0.220	0.225	0.04
Sum of Ag Production	109.016	1,094	25.306	42.050	6.76
Primary Food Processing					
Crop	0.000	0	0.000	0.000	0.00
Dairy	0.000	0	0.000	0.000	0.00
Meat	5.262	14	0.568	0.679	0.11
Sum of Primary Food Proc.	5.262	14	0.568	0.679	0.11
Other Food/Ag Processing					
Animal and Pet Foods	1.229	3	0.071	0.101	0.02
Other Food Processing	7.357	69	2.254	3.939	0.63
Sum of Other Ag Proc.	8.586	72	2.325	4.040	0.65
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.000	0	0.000	0.000	0.00
Farm Machinery	1.098	8	-0.173	-0.065	-0.01
Sum of Ag Input Mfg.	1.098	8	-0.173	-0.065	-0.01
Sum of All Agri-food Ind.	123.962	1,188	28.026	46.704	7.51
NonAg Industries	980.812	11,035	366.566	575.243	92.49
Totals	1,104.774	12,223	394.592	621.947	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 Boone County's agri-food industry output was \$123.962 million, or 11.22 percent of Boone County's total industrial production. Of this, \$46.704 million (37.68 percent) was value added within these industries in Boone County. \$28.026 million of this value added was paid out as wages and salaries to the 1,188 agri-food industry jobs in the county.

Overall, Table 3 shows that Boone County's agri-food industries directly accounted for 11.22 percent of the county's total output, 7.51 percent of total value added, 7.10 percent of labor income, and 9.72 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

Boone County	Value Added				
	As a Percent of				
	Nonhousehold				
Agricultural Production	Output*	Income*	Value Added*	Total V.A.	Demand
Oilseeds	34.132	13.758	19.365	3.11	3.81
Grain	55.331	18.994	27.656	4.45	5.43
Other Crops	2.294	1.020	1.484	0.24	0.29
Cattle	18.186	2.550	3.983	0.64	0.78
Poultry	11.005	2.961	4.359	0.70	0.86
Hogs and Pigs	10.087	2.048	2.854	0.46	0.56
Other Ag Production	1.795	0.364	0.508	0.08	0.10
Sum of Ag Production	132.830	41.695	60.209	9.68	11.83
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	2.284	0.337	0.489	0.08	0.10
Sum of Primary Food Proc.	2.284	0.337	0.489	0.08	0.10
Other Food/Ag Processing					
Animal and Pet Foods	1.773	0.281	0.419	0.07	0.08
Other Food Processing	6.700	2.513	3.751	0.60	0.74
Sum of Other Ag Proc.	8.473	2.795	4.170	0.67	0.82
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.000	0.000	0.000	0.00	0.00
Farm Machinery	1.080	-0.027	0.076	0.01	0.01
Sum of Ag Input Mfg.	1.080	-0.027	0.076	0.01	0.01
Sum of All Agri-food Ind.	144.667	44.799	64.944	10.44	12.76
NonAg Industries	787.791	316.332	443.986	71.39	87.24
Household Consumption	172.316	435.084	113.017	18.17	22.21
Totals	1,104.774	796.215	621.947	100.00	122.21

* 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 Boone County's agricultural production industry was \$132.830 million. \$60.209 million of this output (45.33 percent of the total output value) was the value added to the output by economic activity within Boone County (value added). The remainder came from inputs purchased from out-of-county sources. 69.25 percent of this value added, or \$41.695 million, was paid out as personal income to residents of Boone 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 Boone County's agri-food industry output was \$144.667 million, or 13.09 percent of Boone County's total industrial production. Of this, \$64.944 million (44.89 percent) was value added within these industries in Boone County. \$44.799 million of this value added was paid out as personal income.

Overall, Table 4 shows that exports from Boone County's agri-food industries accounted for 13.09 percent of the county's total output, 10.44 percent of total value added, and 5.63 percent of the county's personal income.

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

	Boone County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold*	105,933	123,544	12,273,634	12,162,165
Value of Crops Sold*	75,622	89,051	6,071,272	6,381,676
Total Cropland Harvested (acres)	267,212	295,493	23,994,343	24,008,826
Corn for grain	137,717	146,337	11,761,392	11,930,542
Corn for silage and green-chop	598	558	247,269	244,913
Soybeans	120,863	142,615	10,418,621	10,258,681
Oats	1,099	1,209	143,513	214,485
Harvested forage crops	7,187	(NA)	1,533,027	(NA)
Bushels harvested				
Corn	22,815,697	20,953,660	1,851,276,224	1,581,093,092
Soybeans	5,574,789	6,255,594	487,380,897	459,309,682
Oats	97,652	90,400	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 Boone County crop inventories and sales for 1997 and 2002. State statistics are included for comparison. Table 6 provides similar information for Boone 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

	Boone County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold	105,933	123,544	12,273,634	12,162,165
Value of Livestock and Livestock Products Sold*	30,311	34,493	6,202,362	5,780,489
Hogs and Pigs				
Total inventory	63,649	101,010	15,486,531	14,513,319
Inventory of breeding stock	4,848	9,869	1,145,323	1,354,166
Number sold	126,090	199,402	41,232,492	27,340,921
Value of sales*	10,627	22,543	3,078,455	3,012,764
Cattle and Calves				
Total inventory	17,309	17,178	3,535,945	3,717,394
Beef cows	4,468	5,887	987,670	1,051,178
Milk cows	288	104	206,965	222,090
Number sold	19,371	14,525	2,929,704	2,936,978
Value of sales*	15,739	9,804	2,119,935	1,886,416
Value of Dairy Products Sold*	419	(D)	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	433	508	1,730,091	1,023,349
Broiler and meat-type chickens sold	720	1,653	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	(D)	(NA)	23,366	(NA)
Inventory of sheep and lambs	1,917	1,785	249,908	272,913
Number of sheep and lambs sold	2,773	1,453	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 Boone 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	14,440	210,774	225,214	(NA)	(NA)	(NA)
1991	14,860	219,912	234,772	420	9,138	9,558
1992	24,773	230,076	254,849	9,913	10,164	20,077
1993	3,499	236,649	240,148	-21,274	6,573	-14,701
1994	24,682	250,314	274,996	21,183	13,665	34,848
1995	23,546	261,348	284,894	-1,136	11,034	9,898
1996	31,787	282,137	313,924	8,241	20,789	29,030
1997	30,683	287,112	317,795	-1,104	4,975	3,871
1998	18,273	308,265	326,538	-12,410	21,153	8,743
1999	6,079	320,921	327,000	-12,194	12,656	462
2000	6,252	345,550	351,802	173	24,629	24,802
2001	3,375	345,358	348,733	-2,877	-192	-3,069
2002	9,327	356,927	366,254	5,952	11,569	17,521
2003	6,772	380,305	387,077	-2,555	23,378	20,823

Data from the US Bureau of Economic Analysis