

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

Report prepared with funding from the Coalition to Support Iowa's Farmers
 By Mark Imerman, David Swenson, Liesl Eathington, and Daniel Otto
 Iowa State University Department of Economics
 September 23, 2005

This summary report provides county-level statistics for Audubon 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 Audubon County had 638 farms in 2002. These farms averaged 409 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 Audubon County was \$849,760 in 2002, compared to \$808,152 for Iowa and \$604,403, nationwide. In 2002, Audubon County farms marketed an average of \$176,658 worth of farm products according to the US Census of Agriculture.

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

	Audubon County		Iowa		United States	
	2002	1997	2002	1997	2002	1997
Number of farms	638	686	90,655	96,705	2,128,982	2,215,876
Land in farms (acres)	261,210	281,826	31,729,490	32,313,119	938,279,056	954,752,502
Average farm size (acres)	409	411	350	334	441	431
Market value, per farm, of						
Land and buildings (\$)	740,445	647,271	707,730	559,678	537,833	416,007
Machinery and equipment (\$)	109,315	86,102	100,422	79,607	66,570	53,861
Farm products sold (\$)	176,658	169,721	135,388	125,766	94,245	90,880

Table 2 shows employment data for Audubon 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 Audubon 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)

	Audubon County			Iowa	
	Jobs	As a percent of County total	State Category	Jobs	% of state total
Farm and closely-related	869	21.71	0.43	201,967	10.57
Peripherally-related	152	3.79	0.08	191,669	10.04
Total farm and farm-related	1,020	25.49	0.26	393,636	20.61
Total employment	4,002	100.00	0.21	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 Audubon 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 Audubon 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 Audubon County.

Table 3 shows that, in 2002, the total output value of Audubon County's agricultural production industry was \$108.229 million. \$32.653 million of this output (30.17 percent of the total output value) was the value added to the output by Audubon 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). 49.82 percent of this value added, or \$16.266 million, was paid out as compensation to the 921 production agriculture jobs in Audubon 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

Audubon County		Labor		Value-Added	
Agricultural Production	Output*	Jobs	Income*	Value*	Pct. Of Tot.
Oilseeds	20.599	126	6.773	11.075	8.23
Grain	28.182	260	6.724	12.763	9.48
Other Crops	2.754	7	0.519	1.389	1.03
Cattle	24.452	106	0.104	1.746	1.30
Poultry	3.825	5	0.472	1.249	0.93
Hogs and Pigs	24.084	349	1.395	3.740	2.78
Other Ag Production	4.333	68	0.279	0.691	0.51
Sum of Ag Production	108.229	921	16.266	32.653	24.25
Primary Food Processing					
Crop	0.000	0	0.000	0.000	0.00
Dairy	0.000	0	0.000	0.000	0.00
Meat	4.449	13	0.357	0.428	0.32
Sum of Primary Food Proc.	4.449	13	0.357	0.428	0.32
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.	112.678	934	16.623	33.081	24.57
NonAg Industries	185.429	2,105	68.796	101.558	75.43
Totals	298.107	3,039	85.419	134.639	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 Audubon County's agri-food industry output was \$112.678 million, or 37.80 percent of Audubon County's total industrial production. Of this, \$33.081 million (29.36 percent) was value added within these industries in Audubon County. \$16.623 million of this value added was paid out as wages and salaries to the 934 agri-food industry jobs in the county.

Overall, Table 3 shows that Audubon County's agri-food industries directly accounted for 37.80 percent of the county's total output, 24.57 percent of total value added, 19.46 percent of labor income, and 30.74 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

Audubon County	Value Added				
	Output*	Income*	Value Added*	As a Percent of Nonhousehold Demand	
Total V.A.				Demand	
Agricultural Production					
Oilseeds	25.223	10.785	14.059	10.44	12.15
Grain	30.381	10.881	14.721	10.93	12.72
Other Crops	0.179	0.065	0.094	0.07	0.08
Cattle	27.245	2.853	4.812	3.57	4.16
Poultry	4.609	1.246	1.748	1.30	1.51
Hogs and Pigs	29.642	4.734	7.226	5.37	6.24
Other Ag Production	5.276	0.843	1.286	0.96	1.11
Sum of Ag Production	122.555	31.407	43.946	32.64	37.97
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	6.508	0.736	1.092	0.81	0.94
Sum of Primary Food Proc.	6.508	0.736	1.092	0.81	0.94
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.	129.063	32.143	45.039	33.45	38.91
NonAg Industries	139.846	55.611	70.707	52.52	61.09
Household Consumption	29.198	91.920	18.893	14.03	16.32
Totals	298.107	179.674	134.639	100.00	116.32

* 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 Audubon County's agricultural production industry was \$122.555 million. \$43.946 million of this output (35.86 percent of the total output value) was the value added to the output by economic activity within Audubon County (value added). The remainder came from inputs purchased from out-of-county sources. 71.47 percent of this value added, or \$31.407 million, was paid out as personal income to residents of Audubon 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 Audubon County's agri-food industry output was \$129.063 million, or 43.29 percent of Audubon County's total industrial production. Of this, \$45.039 million (34.90 percent) was value added within these industries in Audubon County. \$32.143 million of this value added was paid out as personal income.

Overall, Table 4 shows that exports from Audubon County's agri-food industries accounted for 43.29 percent of the county's total output, 33.45 percent of total value added, and 17.89 percent of the county's personal income.

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

	Audubon County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold*	112,708	116,428	12,273,634	12,162,165
Value of Crops Sold*	46,744	54,714	6,071,272	6,381,676
Total Cropland Harvested (acres)	205,216	225,163	23,994,343	24,008,826
Corn for grain	97,642	107,023	11,761,392	11,930,542
Corn for silage and green-chop	1,444	1,346	247,269	244,913
Soybeans	95,327	105,604	10,418,621	10,258,681
Oats	1,184	1,441	143,513	214,485
Harvested forage crops	10,321	(NA)	1,533,027	(NA)
Bushels harvested				
Corn	14,470,133	13,299,799	1,851,276,224	1,581,093,092
Soybeans	4,443,662	4,639,176	487,380,897	459,309,682
Oats	101,282	96,079	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 Audubon County crop inventories and sales for 1997 and 2002. State statistics are included for comparison. Table 6 provides similar information for Audubon 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

	Audubon County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold	112,708	116,428	12,273,634	12,162,165
Value of Livestock and Livestock Products Sold*	65,964	61,714	6,202,362	5,780,489
Hogs and Pigs				
Total inventory	192,491	167,977	15,486,531	14,513,319
Inventory of breeding stock	20,620	12,251	1,145,323	1,354,166
Number sold	695,617	372,133	41,232,492	27,340,921
Value of sales*	41,855	36,473	3,078,455	3,012,764
Cattle and Calves				
Total inventory	27,202	33,150	3,535,945	3,717,394
Beef cows	9,667	8,916	987,670	1,051,178
Milk cows	97	252	206,965	222,090
Number sold	30,600	32,284	2,929,704	2,936,978
Value of sales*	23,613	23,815	2,119,935	1,886,416
Value of Dairy Products Sold*	97	(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	(D)	124	1,730,091	1,023,349
Broiler and meat-type chickens sold	440	1,418	9,558,127	6,919,963
Turkey inventory	(D)	(D)	3,681,862	2,552,845
Turkeys sold	-	-	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	1,051	1,026	249,908	272,913
Number of sheep and lambs sold	855	1,356	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 Audubon 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	19,652	43,579	63,231	(NA)	(NA)	(NA)
1991	20,812	48,049	68,861	1,160	4,470	5,630
1992	23,301	50,119	73,420	2,489	2,070	4,559
1993	9,402	51,913	61,315	-13,899	1,794	-12,105
1994	22,773	52,857	75,630	13,371	944	14,315
1995	15,436	52,885	68,321	-7,337	28	-7,309
1996	33,612	53,310	86,922	18,176	425	18,601
1997	35,819	56,005	91,824	2,207	2,695	4,902
1998	18,247	60,177	78,424	-17,572	4,172	-13,400
1999	4,514	62,139	66,653	-13,733	1,962	-11,771
2000	13,812	67,852	81,664	9,298	5,713	15,011
2001	9,031	72,135	81,166	-4,781	4,283	-498
2002	9,809	73,696	83,505	778	1,561	2,339
2003	6,432	76,736	83,168	-3,377	3,040	-337

Data from the US Bureau of Economic Analysis