

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

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This summary report provides county-level statistics for Carroll 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 Carroll County had 1,045 farms in 2002. These farms averaged 348 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 Carroll County was \$927,477 in 2002, compared to \$808,152 for Iowa and \$604,403, nationwide. In 2002, Carroll County farms marketed an average of \$252,648 worth of farm products according to the US Census of Agriculture.

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

	Carroll County		Iowa		United States	
	2002	1997	2002	1997	2002	1997
Number of farms	1,045	1,151	90,655	96,705	2,128,982	2,215,876
Land in farms (acres)	364,175	361,668	31,729,490	32,313,119	938,279,056	954,752,502
Average farm size (acres)	348	314	350	334	441	431
Market value, per farm, of						
Land and buildings (\$)	798,845	594,836	707,730	559,678	537,833	416,007
Machinery and equipment (\$)	128,632	102,675	100,422	79,607	66,570	53,861
Farm products sold (\$)	252,648	193,220	135,388	125,766	94,245	90,880

Table 2 shows employment data for Carroll 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 Carroll 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)

	Carroll County			Iowa	
	Jobs	As a percent of County total	State Category	Jobs	% of state total
Farm and closely-related	1,656	10.06	0.82	201,967	10.57
Peripherally-related	1,321	8.03	0.69	191,669	10.04
Total farm and farm-related	2,976	18.09	0.76	393,636	20.61
Total employment	16,457	100.00	0.86	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 Carroll 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 Carroll 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 Carroll County.

Table 3 shows that, in 2002, the total output value of Carroll County's agricultural production industry was \$274.670 million. \$73.054 million of this output (26.60 percent of the total output value) was the value added to the output by Carroll 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). 59.17 percent of this value added, or \$43.228 million, was paid out as compensation to the 3,192 production agriculture jobs in Carroll 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

Carroll County			Labor	Value-Added	
Agricultural Production	Output*	Jobs	Income*	Value*	Pct. Of Tot.
Oilseeds	32.581	173	10.690	17.517	2.55
Grain	46.264	371	10.910	20.951	3.05
Other Crops	3.404	8	0.627	1.764	0.26
Cattle	92.064	345	-0.209	6.643	0.97
Poultry	0.000	0	0.000	0.000	0.00
Hogs and Pigs	76.876	966	3.347	11.938	1.74
Other Ag Production	23.481	1,329	17.863	14.241	2.07
Sum of Ag Production	274.670	3,192	43.228	73.054	10.64
Primary Food Processing					
Crop	49.743	42	1.896	2.640	0.38
Dairy	0.000	0	0.000	0.000	0.00
Meat	5.872	26	0.961	1.172	0.17
Sum of Primary Food Proc.	55.615	68	2.857	3.812	0.56
Other Food/Ag Processing					
Animal and Pet Foods	19.927	40	1.516	2.148	0.31
Other Food Processing	0.431	3	0.042	0.089	0.01
Sum of Other Ag Proc.	20.358	43	1.558	2.237	0.33
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.582	2	0.059	0.110	0.02
Farm Machinery	1.484	8	0.055	0.292	0.04
Sum of Ag Input Mfg.	2.066	10	0.114	0.402	0.06
Sum of All Agri-food Ind.	352.709	3,313	47.757	79.505	11.58
NonAg Industries	1,117.592	13,585	382.967	606.866	88.42
Totals	1,470.301	16,898	430.724	686.371	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 Carroll County's agri-food industry output was \$352.709 million, or 23.99 percent of Carroll County's total industrial production. Of this, \$79.505 million (22.54 percent) was value added within these industries in Carroll County. \$47.757 million of this value added was paid out as wages and salaries to the 3,313 agri-food industry jobs in the county.

Overall, Table 3 shows that Carroll County's agri-food industries directly accounted for 23.99 percent of the county's total output, 11.58 percent of total value added, 11.09 percent of labor income, and 19.61 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

Carroll County	Output*	Income*	Value Added*	Value Added As a Percent of Nonhousehold	
				Total V.A.	Demand
Agricultural Production					
Oilseeds	24.833	9.508	13.833	2.02	2.24
Grain	51.548	17.027	25.693	3.74	4.17
Other Crops	0.363	0.115	0.197	0.03	0.03
Cattle	122.623	13.668	25.383	3.70	4.11
Poultry	0.000	0.000	0.000	0.00	0.00
Hogs and Pigs	103.449	15.292	27.746	4.04	4.50
Other Ag Production	19.068	9.787	11.097	1.62	1.80
Sum of Ag Production	321.884	65.396	103.949	15.14	16.85
Primary Food Processing					
Crop	88.968	16.577	25.979	3.79	4.21
Dairy	0.000	0.000	0.000	0.00	0.00
Meat	4.532	0.843	1.290	0.19	0.21
Sum of Primary Food Proc.	93.499	17.420	27.270	3.97	4.42
Other Food/Ag Processing					
Animal and Pet Foods	28.593	4.604	7.237	1.05	1.17
Other Food Processing	0.597	0.114	0.195	0.03	0.03
Sum of Other Ag Proc.	29.189	4.718	7.432	1.08	1.20
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.339	0.059	0.097	0.01	0.02
Farm Machinery	1.299	0.157	0.372	0.05	0.06
Sum of Ag Input Mfg.	1.639	0.215	0.469	0.07	0.08
Sum of All Agri-food Ind.	446.211	87.749	139.120	20.27	22.55
NonAg Industries	908.488	302.354	477.742	69.60	77.45
Household Consumption	115.602	225.348	69.509	10.13	11.27
Totals	1,470.301	615.451	686.371	100.00	111.27

* 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 Carroll County's agricultural production industry was \$321.884 million. \$103.949 million of this output (32.29 percent of the total output value) was the value added to the output by economic activity within Carroll County (value added). The remainder came from inputs purchased from out-of-county sources. 62.91 percent of this value added, or \$65.396 million, was paid out as personal income to residents of Carroll 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 Carroll County's agri-food industry output was \$446.211 million, or 30.35 percent of Carroll County's total industrial production. Of this, \$139.120 million (31.18 percent) was value added within these industries in Carroll County. \$87.749 million of this value added was paid out as personal income.

Overall, Table 4 shows that exports from Carroll County's agri-food industries accounted for 30.35 percent of the county's total output, 20.27 percent of total value added, and 14.26 percent of the county's personal income.

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

	Carroll County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold*	264,017	222,396	12,273,634	12,162,165
Value of Crops Sold*	75,490	79,261	6,071,272	6,381,676
Total Cropland Harvested (acres)	310,612	309,778	23,994,343	24,008,826
Corn for grain	154,739	154,763	11,761,392	11,930,542
Corn for silage and green-chop	3,693	2,657	247,269	244,913
Soybeans	141,471	142,368	10,418,621	10,258,681
Oats	1,736	2,369	143,513	214,485
Harvested forage crops	9,869	(NA)	1,533,027	(NA)
Bushels harvested				
Corn	23,681,414	20,014,751	1,851,276,224	1,581,093,092
Soybeans	7,028,447	6,333,465	487,380,897	459,309,682
Oats	150,515	189,536	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 Carroll County crop inventories and sales for 1997 and 2002. State statistics are included for comparison. Table 6 provides similar information for Carroll 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

	Carroll County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold	264,017	222,396	12,273,634	12,162,165
Value of Livestock and Livestock Products Sold*	188,527	143,135	6,202,362	5,780,489
Hogs and Pigs				
Total inventory	531,966	369,537	15,486,531	14,513,319
Inventory of breeding stock	36,829	30,072	1,145,323	1,354,166
Number sold	1,379,984	711,176	41,232,492	27,340,921
Value of sales*	98,780	77,385	3,078,455	3,012,764
Cattle and Calves				
Total inventory	70,074	73,442	3,535,945	3,717,394
Beef cows	8,443	9,853	987,670	1,051,178
Milk cows	297	233	206,965	222,090
Number sold	103,840	96,674	2,929,704	2,936,978
Value of sales*	88,904	64,878	2,119,935	1,886,416
Value of Dairy Products Sold*	613	406	442,431	407,897
Poultry and Poultry Products				
Value of sales*	(D)	10	511,949	414,587
Inventory of layers 20 weeks and older	440	660	38,650,210	21,514,768
Broiler and meat-type chicken inventory	1,200	266	1,730,091	1,023,349
Broiler and meat-type chickens sold	1,610	3,075	9,558,127	6,919,963
Turkey inventory	73	10	3,681,862	2,552,845
Turkeys sold	184	54	9,145,415	7,279,822
Sheep and Goats and Related Products				
Value of sales	144	(NA)	23,366	(NA)
Inventory of sheep and lambs	2,365	2,791	249,908	272,913
Number of sheep and lambs sold	1,733	3,495	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 Carroll 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	36,185	204,502	240,687	(NA)	(NA)	(NA)
1991	33,802	218,089	251,891	-2,383	13,587	11,204
1992	54,071	237,546	291,617	20,269	19,457	39,726
1993	27,343	255,343	282,686	-26,728	17,797	-8,931
1994	48,255	262,261	310,516	20,912	6,918	27,830
1995	42,836	270,934	313,770	-5,419	8,673	3,254
1996	64,239	291,795	356,034	21,403	20,861	42,264
1997	62,746	312,853	375,599	-1,493	21,058	19,565
1998	33,555	344,010	377,565	-29,191	31,157	1,966
1999	12,252	354,737	366,989	-21,303	10,727	-10,576
2000	27,211	368,350	395,561	14,959	13,613	28,572
2001	24,675	372,448	397,123	-2,536	4,098	1,562
2002	26,373	383,216	409,589	1,698	10,768	12,466
2003	18,656	403,695	422,351	-7,717	20,479	12,762

Data from the US Bureau of Economic Analysis