

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

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This summary report provides county-level statistics for Guthrie 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 Guthrie County had 885 farms in 2002. These farms averaged 366 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 Guthrie County was \$714,971 in 2002, compared to \$808,152 for Iowa and \$604,403, nationwide. In 2002, Guthrie County farms marketed an average of \$125,631 worth of farm products according to the US Census of Agriculture.

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

	Guthrie County		Iowa		United States	
	2002	1997	2002	1997	2002	1997
Number of farms	885	910	90,655	96,705	2,128,982	2,215,876
Land in farms (acres)	323,738	313,984	31,729,490	32,313,119	938,279,056	954,752,502
Average farm size (acres)	366	345	350	334	441	431
Market value, per farm, of						
Land and buildings (\$)	627,640	463,787	707,730	559,678	537,833	416,007
Machinery and equipment (\$)	87,331	65,250	100,422	79,607	66,570	53,861
Farm products sold (\$)	125,631	106,753	135,388	125,766	94,245	90,880

Table 2 shows employment data for Guthrie 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 Guthrie 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)

	Guthrie County			Iowa	
	Jobs	County total	As a percent of State Category	Jobs	% of state total
Farm and closely-related	1,165	22.21	0.58	201,967	10.57
Peripherally-related	403	7.69	0.21	191,669	10.04
Total farm and farm-related	1,568	29.90	0.40	393,636	20.61
Total employment	5,244	100.00	0.27	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 Guthrie 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 Guthrie 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 Guthrie County.

Table 3 shows that, in 2002, the total output value of Guthrie County's agricultural production industry was \$98.807 million. \$33.408 million of this output (33.81 percent of the total output value) was the value added to the output by Guthrie 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). 55.48 percent of this value added, or \$18.536 million, was paid out as compensation to the 1,190 production agriculture jobs in Guthrie 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

Guthrie County		Labor		Value-Added	
Agricultural Production	Output*	Jobs	Income*	Value*	Pct. Of Tot.
Oilseeds	20.457	215	6.771	10.998	6.13
Grain	30.043	475	7.444	13.605	7.58
Other Crops	4.982	24	1.367	2.893	1.61
Cattle	24.798	185	0.633	1.709	0.95
Poultry	7.614	16	1.141	2.485	1.38
Hogs and Pigs	9.216	228	0.967	1.431	0.80
Other Ag Production	1.697	47	0.213	0.287	0.16
Sum of Ag Production	98.807	1,190	18.536	33.408	18.62
Primary Food Processing					
Crop	5.907	5	0.221	0.414	0.23
Dairy	0.000	0	0.000	0.000	0.00
Meat	0.235	1	0.022	0.027	0.02
Sum of Primary Food Proc.	6.142	6	0.243	0.441	0.25
Other Food/Ag Processing					
Animal and Pet Foods	2.958	5	0.386	0.598	0.33
Other Food Processing	0.000	0	0.000	0.000	0.00
Sum of Other Ag Proc.	2.958	5	0.386	0.598	0.33
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.954	4	0.163	0.392	0.22
Farm Machinery	0.000	0	0.000	0.000	0.00
Sum of Ag Input Mfg.	0.954	4	0.163	0.392	0.22
Sum of All Agri-food Ind.	108.861	1,205	19.328	34.839	19.41
NonAg Industries	225.626	3,278	88.743	144.624	80.59
Totals	334.487	4,483	108.071	179.463	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 Guthrie County's agri-food industry output was \$108.861 million, or 32.55 percent of Guthrie County's total industrial production. Of this, \$34.839 million (32.00 percent) was value added within these industries in Guthrie County. \$19.328 million of this value added was paid out as wages and salaries to the 1,205 agri-food industry jobs in the county.

Overall, Table 3 shows that Guthrie County's agri-food industries directly accounted for 32.55 percent of the county's total output, 19.41 percent of total value added, 17.88 percent of labor income, and 26.88 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

Guthrie County	Value Added				
	As a Percent of				
	Nonhousehold				
Agricultural Production	Output*	Income*	Value Added*	Total V.A.	Demand
Oilseeds	26.374	10.937	14.858	8.28	10.85
Grain	35.298	12.380	17.425	9.71	12.73
Other Crops	1.346	0.545	0.799	0.45	0.58
Cattle	33.806	4.580	7.416	4.13	5.42
Poultry	9.398	2.537	3.668	2.04	2.68
Hogs and Pigs	12.474	2.345	3.457	1.93	2.53
Other Ag Production	2.220	0.417	0.615	0.34	0.45
Sum of Ag Production	120.917	33.741	48.238	26.88	35.24
Primary Food Processing					
Crop	6.796	0.784	1.155	0.64	0.84
Dairy	0.000	0.000	0.000	0.00	0.00
Meat	0.030	0.005	0.006	0.00	0.00
Sum of Primary Food Proc.	6.825	0.789	1.161	0.65	0.85
Other Food/Ag Processing					
Animal and Pet Foods	3.743	0.792	1.093	0.61	0.80
Other Food Processing	0.000	0.000	0.000	0.00	0.00
Sum of Other Ag Proc.	3.743	0.792	1.093	0.61	0.80
Ag Input Manufacturing					
Ag Chemical and Fertilizer	0.343	0.101	0.153	0.08	0.11
Farm Machinery	0.000	0.000	0.000	0.00	0.00
Sum of Ag Input Mfg.	0.343	0.101	0.153	0.08	0.11
Sum of All Agri-food Ind.	131.829	35.423	50.645	28.22	37.00
NonAg Industries	138.280	64.680	86.250	48.06	63.00
Household Consumption	64.377	192.633	42.567	23.72	31.09
Totals	334.487	292.736	179.463	100.00	131.09

* 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 Guthrie County's agricultural production industry was \$120.917 million. \$48.238 million of this output (39.89 percent of the total output value) was the value added to the output by economic activity within Guthrie County (value added). The remainder came from inputs purchased from out-of-county sources. 69.95 percent of this value added, or \$33.741 million, was paid out as personal income to residents of Guthrie 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 Guthrie County's agri-food industry output was \$131.829 million, or 39.41 percent of Guthrie County's total industrial production. Of this, \$50.645 million (38.42 percent) was value added within these industries in Guthrie County. \$35.423 million of this value added was paid out as personal income.

Overall, Table 4 shows that exports from Guthrie County's agri-food industries accounted for 39.41 percent of the county's total output, 28.22 percent of total value added, and 12.10 percent of the county's personal income.

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

	Guthrie County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold*	111,183	97,145	12,273,634	12,162,165
Value of Crops Sold*	51,826	45,656	6,071,272	6,381,676
Total Cropland Harvested (acres)	220,536	199,395	23,994,343	24,008,826
Corn for grain	106,286	96,031	11,761,392	11,930,542
Corn for silage and green-chop	1,329	1,010	247,269	244,913
Soybeans	97,056	88,133	10,418,621	10,258,681
Oats	849	1,978	143,513	214,485
Harvested forage crops	16,485	(NA)	1,533,027	(NA)
Bushels harvested				
Corn	15,443,762	11,155,350	1,851,276,224	1,581,093,092
Soybeans	4,413,015	3,477,612	487,380,897	459,309,682
Oats	52,616	125,274	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 Guthrie County crop inventories and sales for 1997 and 2002. State statistics are included for comparison. Table 6 provides similar information for Guthrie 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

	Guthrie County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold	111,183	97,145	12,273,634	12,162,165
Value of Livestock and Livestock Products Sold*	59,357	51,489	6,202,362	5,780,489
Hogs and Pigs				
Total inventory	70,548	81,267	15,486,531	14,513,319
Inventory of breeding stock	4,443	6,870	1,145,323	1,354,166
Number sold	196,539	147,570	41,232,492	27,340,921
Value of sales*	14,452	15,589	3,078,455	3,012,764
Cattle and Calves				
Total inventory	36,137	37,950	3,535,945	3,717,394
Beef cows	15,434	17,091	987,670	1,051,178
Milk cows	1,417	618	206,965	222,090
Number sold	34,614	29,514	2,929,704	2,936,978
Value of sales*	23,947	17,233	2,119,935	1,886,416
Value of Dairy Products Sold*	(D)	750	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	702	662	1,730,091	1,023,349
Broiler and meat-type chickens sold	1,700	(D)	9,558,127	6,919,963
Turkey inventory	33	(D)	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	49	(NA)	23,366	(NA)
Inventory of sheep and lambs	1,059	925	249,908	272,913
Number of sheep and lambs sold	551	1,185	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 Guthrie 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	17,443	58,231	75,674	(NA)	(NA)	(NA)
1991	15,917	61,610	77,527	-1,526	3,379	1,853
1992	21,350	62,698	84,048	5,433	1,088	6,521
1993	5,020	66,813	71,833	-16,330	4,115	-12,215
1994	21,636	67,873	89,509	16,616	1,060	17,676
1995	11,532	72,366	83,898	-10,104	4,493	-5,611
1996	33,499	75,610	109,109	21,967	3,244	25,211
1997	21,681	82,503	104,184	-11,818	6,893	-4,925
1998	16,764	87,829	104,593	-4,917	5,326	409
1999	9,445	92,295	101,740	-7,319	4,466	-2,853
2000	11,901	99,216	111,117	2,456	6,921	9,377
2001	9,531	94,813	104,344	-2,370	-4,403	-6,773
2002	13,623	98,126	111,749	4,092	3,313	7,405
2003	11,240	105,043	116,283	-2,383	6,917	4,534

Data from the US Bureau of Economic Analysis