

Summary Measures of the Economic Importance of Agri-food Industries in Appanoose 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 Appanoose 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 Appanoose County had 816 farms in 2002. These farms averaged 289 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 Appanoose County was \$327,208 in 2002, compared to \$808,152 for Iowa and \$604,403, nationwide. In 2002, Appanoose County farms marketed an average of \$30,984 worth of farm products according to the US Census of Agriculture.

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

	Appanoose County		Iowa		United States	
	2002	1997	2002	1997	2002	1997
Number of farms	816	862	90,655	96,705	2,128,982	2,215,876
Land in farms (acres)	235,638	254,160	31,729,490	32,313,119	938,279,056	954,752,502
Average farm size (acres)	289	295	350	334	441	431
Market value, per farm, of						
Land and buildings (\$)	287,881	191,999	707,730	559,678	537,833	416,007
Machinery and equipment (\$)	39,327	44,141	100,422	79,607	66,570	53,861
Farm products sold (\$)	30,984	35,105	135,388	125,766	94,245	90,880

Table 2 shows employment data for Appanoose 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 Appanoose 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)

	Appanoose County			Iowa	
	Jobs	As a percent of County total	State Category	Jobs	% of state total
Farm and closely-related	920	11.94	0.46	201,967	10.57
Peripherally-related	604	7.83	0.31	191,669	10.04
Total farm and farm-related	1,524	19.77	0.39	393,636	20.61
Total employment	7,708	100.00	0.40	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 Appanoose 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 Appanoose 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 Appanoose County.

Table 3 shows that, in 2002, the total output value of Appanoose County's agricultural production industry was \$31.981 million. \$11.018 million of this output (34.45 percent of the total output value) was the value added to the output by Appanoose 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). 40.03 percent of this value added, or \$4.411 million, was paid out as compensation to the 489 production agriculture jobs in Appanoose 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

Appanoose County			Labor	Value-Added	
Agricultural Production	Output*	Jobs	Income*	Value*	Pct. Of Tot.
Oilseeds	5.461	99	1.785	2.936	1.08
Grain	5.514	150	1.270	2.497	0.92
Other Crops	8.976	65	1.442	4.604	1.69
Cattle	11.423	147	-0.172	0.840	0.31
Poultry	0.000	0	0.000	0.000	0.00
Hogs and Pigs	0.245	11	0.003	0.038	0.01
Other Ag Production	0.362	17	0.083	0.103	0.04
Sum of Ag Production	31.981	489	4.411	11.018	4.06
Primary Food Processing					
Crop	0.000	0	0.000	0.000	0.00
Dairy	0.000	0	0.000	0.000	0.00
Meat	1.069	3	0.063	0.075	0.03
Sum of Primary Food Proc.	1.069	3	0.063	0.075	0.03
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.	33.050	492	4.474	11.093	4.08
NonAg Industries	515.475	5,568	155.799	260.567	95.92
Totals	548.525	6,060	160.273	271.660	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 Appanoose County's agri-food industry output was \$33.050 million, or 6.03 percent of Appanoose County's total industrial production. Of this, \$11.093 million (33.56 percent) was value added within these industries in Appanoose County. \$4.474 million of this value added was paid out as wages and salaries to the 492 agri-food industry jobs in the county.

Overall, Table 3 shows that Appanoose County's agri-food industries directly accounted for 6.03 percent of the county's total output, 4.08 percent of total value added, 2.79 percent of labor income, and 8.12 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

Appanoose County	Value Added				
	As a Percent of				
	Nonhousehold				
Agricultural Production	Output*	Income*	Value Added*	Total V.A.	Demand
Oilseeds	7.371	2.723	4.155	1.53	1.92
Grain	6.381	1.935	3.166	1.17	1.46
Other Crops	8.236	2.313	4.441	1.63	2.05
Cattle	16.254	1.810	3.966	1.46	1.83
Poultry	0.000	0.000	0.000	0.00	0.00
Hogs and Pigs	0.188	0.026	0.055	0.02	0.03
Other Ag Production	0.202	0.028	0.059	0.02	0.03
Sum of Ag Production	38.631	8.836	15.841	5.83	7.32
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	0.660	0.070	0.130	0.05	0.06
Sum of Primary Food Proc.	0.660	0.070	0.130	0.05	0.06
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.	39.291	8.905	15.971	5.88	7.38
NonAg Industries	420.606	129.792	200.473	73.80	92.62
Household Consumption	88.629	192.670	55.216	20.33	25.51
Totals	548.525	331.366	271.660	100.00	125.51

* 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 Appanoose County's agricultural production industry was \$38.631 million. \$15.841 million of this output (41.01 percent of the total output value) was the value added to the output by economic activity within Appanoose County (value added). The remainder came from inputs purchased from out-of-county sources. 55.77 percent of this value added, or \$8.836 million, was paid out as personal income to residents of Appanoose 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 Appanoose County's agri-food industry output was \$39.291 million, or 7.16 percent of Appanoose County's total industrial production. Of this, \$15.971 million (40.65 percent) was value added within these industries in Appanoose County. \$8.905 million of this value added was paid out as personal income.

Overall, Table 4 shows that exports from Appanoose County's agri-food industries accounted for 7.16 percent of the county's total output, 5.88 percent of total value added, and 2.69 percent of the county's personal income.

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

	Appanoose County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold*	25,283	30,260	12,273,634	12,162,165
Value of Crops Sold*	12,970	16,498	6,071,272	6,381,676
Total Cropland Harvested (acres)	88,565	103,810	23,994,343	24,008,826
Corn for grain	21,487	28,732	11,761,392	11,930,542
Corn for silage and green-chop	508	764	247,269	244,913
Soybeans	30,441	32,725	10,418,621	10,258,681
Oats	878	636	143,513	214,485
Harvested forage crops	40,652	(NA)	1,533,027	(NA)
Bushels harvested				
Corn	2,783,553	3,494,422	1,851,276,224	1,581,093,092
Soybeans	1,177,984	1,338,469	487,380,897	459,309,682
Oats	50,268	37,878	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 Appanoose County crop inventories and sales for 1997 and 2002. State statistics are included for comparison. Table 6 provides similar information for Appanoose 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

	Appanoose County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold	25,283	30,260	12,273,634	12,162,165
Value of Livestock and Livestock Products Sold*	12,314	13,763	6,202,362	5,780,489
Hogs and Pigs				
Total inventory	2,027	5,207	15,486,531	14,513,319
Inventory of breeding stock	189	1,004	1,145,323	1,354,166
Number sold	2,630	7,184	41,232,492	27,340,921
Value of sales*	207	913	3,078,455	3,012,764
Cattle and Calves				
Total inventory	38,693	45,169	3,535,945	3,717,394
Beef cows	22,139	24,493	987,670	1,051,178
Milk cows	350	400	206,965	222,090
Number sold	20,912	26,203	2,929,704	2,936,978
Value of sales*	11,031	11,971	2,119,935	1,886,416
Value of Dairy Products Sold*	555	594	442,431	407,897
Poultry and Poultry Products				
Value of sales*	(Z)	3	511,949	414,587
Inventory of layers 20 weeks and older	295	410	38,650,210	21,514,768
Broiler and meat-type chicken inventory	78	533	1,730,091	1,023,349
Broiler and meat-type chickens sold	(D)	(D)	9,558,127	6,919,963
Turkey inventory	16	-	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	(D)	(NA)	23,366	(NA)
Inventory of sheep and lambs	1,019	2,154	249,908	272,913
Number of sheep and lambs sold	790	1,692	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 Appanoose 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	5,881	97,297	103,178	(NA)	(NA)	(NA)
1991	2,158	108,228	110,386	-3,723	10,931	7,208
1992	4,892	114,315	119,207	2,734	6,087	8,821
1993	456	118,677	119,133	-4,436	4,362	-74
1994	7,176	122,975	130,151	6,720	4,298	11,018
1995	-696	123,055	122,359	-7,872	80	-7,792
1996	6,571	128,382	134,953	7,267	5,327	12,594
1997	8,122	137,694	145,816	1,551	9,312	10,863
1998	3,545	152,420	155,965	-4,577	14,726	10,149
1999	2,917	159,089	162,006	-628	6,669	6,041
2000	6,548	161,159	167,707	3,631	2,070	5,701
2001	850	159,544	160,394	-5,698	-1,615	-7,313
2002	4,153	166,351	170,504	3,303	6,807	10,110
2003	3,465	176,756	180,221	-688	10,405	9,717

Data from the US Bureau of Economic Analysis