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

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This summary report provides county-level statistics for Benton 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 Benton County had 1,186 farms in 2002. These farms averaged 338 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 Benton County was $892,061 in 2002, compared to $808,152 for Iowa and $604,403, nationwide. In 2002, Benton County farms marketed an average of $124,750 worth of farm products according to the US Census of Agriculture.

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

	Benton County		Iowa		United States	
	2002	1997	2002	1997	2002	1997
Number of farms	1,186	1,286	90,655	96,705	2,128,982	2,215,876
Land in farms (acres)	400,654	435,037	31,729,490	32,313,119	938,279,056	954,752,502
Average farm size (acres)	338	338	350	334	441	431
Market value, per farm, of						
Land and buildings ($)	789,874	695,903	707,730	559,678	537,833	416,007
Machinery and equipment ($)	102,187	89,232	100,422	79,607	66,570	53,861
Farm products sold ($)	124,750	125,646	135,388	125,766	94,245	90,880

Table 2 shows employment data for Benton 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 states[2]. 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 Benton County. Detail is restricted in this summary, due to the smaller employment base and privacy issues at the county level.

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[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)

	Benton County			Iowa	
		As a percent of			
	Jobs	County total	State Category	Jobs	% of state total
Farm and closely-related	1,664	14.84	0.82	201,967	10.57
Peripherally-related	602	5.37	0.31	191,669	10.04
Total farm and farm-related	2,266	20.21	0.58	393,636	20.61
Total employment	11,208	100.00	0.59	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 Benton 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 Benton 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 jobs[4] and labor income (compensation for employees and proprietors) within the agri-food industries in Benton County.

Table 3 shows that, in 2002, the total output value of Benton County's agricultural production industry was $141.062 million. $54.404 million of this output (38.57 percent of the total output value) was the value added to the output by Benton 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). 54.89 percent of this value added, or $29.864 million, was paid out as compensation to the 1,504 production agriculture jobs in Benton 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

Benton County Agricultural Production	**Output***	**Jobs**	**Labor Income***	**Value-Added Value***	**Pct. Of Tot.**
Oilseeds	35.572	316	11.752	19.126	4.65
Grain	54.948	735	13.468	24.884	6.05
Other Crops	5.952	24	1.520	3.426	0.83
Cattle	20.652	130	0.399	1.437	0.35
Poultry	10.597	19	1.507	3.459	0.84
Hogs and Pigs	*11.325*	*238*	*1.034*	*1.759*	0.43
Other Ag Production	2.016	42	0.184	0.313	0.08
Sum of Ag Production	**141.062**	**1,504**	**29.864**	**54.404**	**13.24**
Primary Food Processing					
Crop	43.697	34	3.617	6.786	1.65
Dairy	0.000	0	0.000	0.000	0.00
Meat	6.115	18	0.544	0.721	0.18
Sum of Primary Food Proc.	**49.812**	**52**	**4.161**	**7.507**	**1.83**
Other Food/Ag Processing					
Animal and Pet Foods	30.486	61	2.123	3.010	0.73
Other Food Processing	34.086	128	5.536	10.054	2.45
Sum of Other Ag Proc.	**64.572**	**189**	**7.659**	**13.064**	**3.18**
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.	**255.446**	**1,745**	**41.684**	**74.975**	**18.24**
NonAg Industries	**563.187**	**6,107**	**201.421**	**336.031**	**81.76**
Totals	**818.633**	**7,852**	**243.105**	**411.006**	**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 Benton County's agri-food industry output was $255.446 million, or 31.20 percent of Benton County's total industrial production. Of this, $74.975 million (29.35 percent) was value added within these industries in Benton County. $41.684 million of this value added was paid out as wages and salaries to the 1,745 agri-food industry jobs in the county.

Overall, Table 3 shows that Benton County's agri-food industries directly accounted for 31.20 percent of the county's total output, 18.24 percent of total value added, 17.15 percent of labor income, and 22.23 percent of the county's jobs[5].

[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

Benton County			**Value Added**		
Agricultural Production	**Output***	**Income***	**Value Added***	**As a Percent of Total V.A.**	**As a Percent of Nonhousehold Demand**
Oilseeds	45.962	18.958	26.118	6.35	8.63
Grain	62.816	21.867	31.293	7.61	10.34
Other Crops	1.256	0.494	0.745	0.18	0.25
Cattle	23.908	3.218	5.371	1.31	1.77
Poultry	11.383	2.960	4.379	1.07	1.45
Hogs and Pigs	*14.112*	*2.605*	*3.967*	0.97	1.31
Other Ag Production	2.512	0.464	0.706	0.17	0.23
Sum of Ag Production	**161.950**	**50.566**	**72.578**	**17.66**	**23.98**
Primary Food Processing					
Crop	50.043	7.939	11.697	2.85	3.86
Dairy	0.000	0.000	0.000	0.00	0.00
Meat	5.460	0.738	1.114	0.27	0.37
Sum of Primary Food Proc.	**55.503**	**8.677**	**12.811**	**3.12**	**4.23**
Other Food/Ag Processing					
Animal and Pet Foods	40.843	6.186	8.835	2.15	2.92
Other Food Processing	42.901	10.611	15.645	3.81	5.17
Sum of Other Ag Proc.	**83.744**	**16.796**	**24.479**	**5.96**	**8.09**
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.	**301.197**	**76.040**	**109.868**	**26.73**	**36.29**
NonAg Industries	**356.702**	**142.416**	**192.847**	**46.92**	**63.71**
Household Consumption	**160.734**	**477.804**	**108.292**	**26.35**	**35.77**
Totals	**818.633**	**696.260**	**411.006**	**100.00**	**135.77**

* 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 produced[6]. 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 sales[7].

[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 Benton County's agricultural production industry was $161.950 million. $72.578 million of this output (44.82 percent of the total output value) was the value added to the output by economic activity within Benton County (value added). The remainder came from inputs purchased from out-of-county sources. 69.67 percent of this value added, or $50.566 million, was paid out as personal income to residents of Benton 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 Benton County's agri-food industry output was $301.197 million, or 36.79 percent of Benton County's total industrial production. Of this, $109.868 million (36.48 percent) was value added within these industries in Benton County. $76.040 million of this value added was paid out as personal income.

Overall, Table 4 shows that exports from Benton County's agri-food industries accounted for 36.79 percent of the county's total output, 26.73 percent of total value added, and 10.92 percent of the county's personal income.

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

	Benton County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold*	147,953	161,581	12,273,634	12,162,165
Value of Crops Sold*	95,301	106,407	6,071,272	6,381,676
Total Cropland Harvested (acres)	331,805	350,786	23,994,343	24,008,826
Corn for grain	161,461	171,666	11,761,392	11,930,542
Corn for silage and green-chop	3,174	1,984	247,269	244,913
Soybeans	152,406	159,869	10,418,621	10,258,681
Oats	1,586	3,700	143,513	214,485
Harvested forage crops	14,304	(NA)	1,533,027	(NA)
Bushels harvested				
Corn	28,235,108	24,169,184	1,851,276,224	1,581,093,092
Soybeans	7,673,891	7,879,339	487,380,897	459,309,682
Oats	133,050	279,199	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 Benton County crop inventories and sales for 1997 and 2002. State statistics are included for comparison. Table 6 provides similar information for Benton 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

	Benton County		Iowa	
	2002	1997	2002	1997
Value of All Farm Products Sold	147,953	161,581	12,273,634	12,162,165
Value of Livestock and Livestock Products Sold*	52,653	55,174	6,202,362	5,780,489
Hogs and Pigs				
Total inventory	88,299	101,051	15,486,531	14,513,319
Inventory of breeding stock	5,644	12,610	1,145,323	1,354,166
Number sold	213,656	199,200	41,232,492	27,340,921
Value of sales*	16,635	22,803	3,078,455	3,012,764
Cattle and Calves				
Total inventory	36,452	40,919	3,535,945	3,717,394
Beef cows	9,551	10,915	987,670	1,051,178
Milk cows	5,302	2,029	206,965	222,090
Number sold	27,256	35,187	2,929,704	2,936,978
Value of sales*	19,943	25,310	2,119,935	1,886,416
Value of Dairy Products Sold*	(D)	3,928	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	1,245	738	1,730,091	1,023,349
Broiler and meat-type chickens sold	7,365	8,203	9,558,127	6,919,963
Turkey inventory	61	63	3,681,862	2,552,845
Turkeys sold	247	306	9,145,415	7,279,822
Sheep and Goats and Related Products				
Value of sales	268	(NA)	23,366	(NA)
Inventory of sheep and lambs	4,602	3,089	249,908	272,913
Number of sheep and lambs sold	3,439	2,597	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 Benton 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	29,015	124,992	154,007	(NA)	(NA)	(NA)
1991	19,791	129,357	149,148	-9,224	4,365	-4,859
1992	31,509	134,683	166,192	11,718	5,326	17,044
1993	15,437	140,166	155,603	-16,072	5,483	-10,589
1994	29,131	151,890	181,021	13,694	11,724	25,418
1995	20,449	154,012	174,461	-8,682	2,122	-6,560
1996	44,842	159,521	204,363	24,393	5,509	29,902
1997	43,748	170,264	214,012	-1,094	10,743	9,649
1998	26,260	187,642	213,902	-17,488	17,378	-110
1999	9,097	201,471	210,568	-17,163	13,829	-3,334
2000	11,017	221,606	232,623	1,920	20,135	22,055
2001	8,847	227,260	236,107	-2,170	5,654	3,484
2002	14,727	235,588	250,315	5,880	8,328	14,208
2003	5,260	248,578	253,838	-9,467	12,990	3,523

Data from the US Bureau of Economic Analysis