

Interim Update on the Economic Impact of Michigan's Agri-Food and Agri-Energy System

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Introduction

In January 2006, the MSU Product Center for Agriculture and Natural Resources published a report entitled "The Economic Impact and Potential of Michigan's Agri-Food System." The economic impact numbers had a significant influence on public and private decision makers in regard to the importance of agriculture and food to the state's economy. Several of these same decision makers have requested that the information published two years ago be updated. This report provides this requested update.

Findings

Table 1 summarizes the 2006 economic impact of Michigan's agri-food and agri-energy system. The total 2006 economic impact (including direct and indirect) of Michigan's agri-food and agri-energy system is estimated to be \$63.7 billion, an increase of approximately \$3.6 billion or 5.9 percent from the 2004 estimate. The direct economic impact of the agri-food system is estimated to be \$38.0 billion and the direct economic impact of the agri-energy system (ethanol) is estimated to be \$378 million. Ethanol production has become a far more significant economic activity in the state. In 2004, the figure was only \$64 million; four additional ethanol plants for a total of five in the state have dramatically increased its economic impact. Farming's impact is estimated to have increased at a faster rate than other agri-food activities (6.4% vs. 4.9%).

Table 1: Total Direct and Indirect Economic Activity Michigan Agri-Food and Agri-Energy System 2006 (Millions of Dollars)

Category	Direct	Indirect	'06 Total	'04 Total	% Change
Farming	\$ 5,110	\$ 2,012	\$ 7,122	\$6,694	6.4%
Other Agri-Food (agri-food processing, wholesaling, retailing)	\$ 32,907	\$ 23,075	\$ 55,982	\$53,389	4.9%
Total Agri-Food	\$ 38,017	\$ 25,087	\$ 63,104	\$60,083	5.0%
Ethanol Production*	\$ 378	\$ 216	\$ 594	\$75	692.0%
Grand Total	\$ 38,395	\$ 25,303	\$ 63,698	\$60,158	5.9%

* Ethanol Figures are an estimate for 2007 production levels.

Methodology

These figures should be considered rough estimates. Three year averages from 2004-2006 were used to get the farm level economic impacts. The figures are based on numbers obtained from the Michigan Agricultural Statistics Service. The other agri-food figures were based on the CPI for food in 2005 and 2006. The economic impact of ethanol production was based on estimated ethanol output in 2007 and the average price of ethanol in 2007. Using the 2007 ethanol numbers was deemed appropriate given the start-up nature of this industry over the last two years with 2007 better representative of the economic activity now in place. Indirect impacts are estimated by multipliers provided by Implan, a computer software program that models the economy. The multipliers for farming and ethanol have been updated from the prior study. The “other agri-food” multipliers could not be updated due to their composite nature and have been held at the level of the prior study.

A further refinement of these rough estimates of the impact of the agri-food and agri-energy system cannot be undertaken at this point in time. To do this, updated figures from the U.S. Economic Census need to be obtained. These figures will not be available until 2009 or 2010. The estimates in this report must thus be considered advisory only and may be subject to substantial adjustment in the future as better data becomes available.

The Economic Intuition behind the Growth Rate in Economic Impact

The 5.9% growth in the economic impact of the agri-food system is certainly significant particularly in light of the state’s general economic growth rate of 4.8% over the last two years. However, some may be surprised that the growth rate is not substantially higher because of the dramatic change in farm commodity prices over the last two years. There are several reasons why the growth rate reported is likely reasonable.

1. **One farmer’s output is another farmer’s input.** Livestock producers depend on feed for their animals. The value of this feed reduces the total impact in order to avoid double counting (the value of the feed is included in the value of milk, eggs, cattle, hog, and poultry prices). Also, higher feed grain prices put pressure on the profits of livestock producers everything else held constant. In this report, all double counting has been accounted for in the “other agri-food” estimate. Therefore, the farming estimate is a bit overstated but the total economic impact across the agri-food system nets out the double counting.
2. **Farmers do not produce food; they produce food ingredients.** Farm products need to be handled, processed, transported, wholesaled and retailed before they are sold to consumers. Even fresh fruits and vegetables need to be handled, sorted, graded and shipped before reaching consumers. Fluid milk needs to be transported, pasteurized, homogenized, etc. Processed foods like pastas, bread, cereal, meat, and manufactured dairy products require even more intermediate steps between the farmer and the consumer. Most of the value added of food products comes from food manufacturing, food distribution, and in the case of restaurants food preparation, not from the farm

sector. These firms are not able to completely pass on higher agricultural commodity prices to consumers, and as a result their profit margins are narrowed. One implication of this is that food costs will rise relatively modestly despite the large increase in commodity prices because of their relatively small role in the total food bill paid by consumers. The primary impact will be felt by other firms in the agri-food system.

3. **A significant part of the price escalation occurred in 2007 and is not reflected here.** However, even if it were, the first two reasons given, suggest that the impacts of the price increases will not be as dramatic in total as might be expected.

Consistent with these three points is the observation that the multiplier for farming that gives rise to the indirect economic impacts has in fact been adjusted downward over the two years since the prior study.

Component Economic Impacts of the Farm Sector

The economic impacts of the various components of the farm sector are shown in the following tables. These figures are based on numbers provided by the Michigan Agricultural Statistics Service with multipliers provided by IMPLAN to generate the total value. Table 2 shows the economic impact of selected field crops. Table 3 shows the economic impact of fruit production. Table 4 shows the economic impact of vegetable production. Table 5 shows the economic impact of livestock production. Table 6 then aggregates Tables 2-5 and adds the impacts for floriculture/nursery and miscellaneous. The totals from table 6 match the farming estimates in Table 1.

Crop	Direct Value	Total Value
Barley	\$1,089,333	\$1,386,721
Corn for Grain	656,398,000	835,594,654
Dry Beans	75,277,000	99,215,086
Hay	313,912,333	399,610,400
Oats	7,901,667	10,058,822
Potatoes	108,221,000	142,635,278
Soybeans	471,877,333	584,656,016
Sugarbeets	108,985,667	159,010,088
Wheat	135,500,667	172,492,349
Other	32,472,333	42,798,535
Total	\$1,911,635,333	\$2,447,457,949

**Table 3: Economic Impact of Fruit Production
(Average 2004-2006)**

Crop	Direct Impact	Total Impact
Apples	\$101,624,333	\$146,135,791
Blueberries	106,819,000	153,605,722
Tart Cherries	44,037,667	63,326,165
Peaches	10,440,667	15,013,679
Sweet Cherries	17,321,667	24,908,557
Grapes	14,955,333	21,505,769
Pears	1,004,000	1,443,752
Plums	1,046,667	1,505,107
Strawberries	5,056,000	7,270,528
Other	2,991,667	4,302,017
Total	\$305,297,001	\$439,017,087

Table 4: Economic Impact of Vegetables (Average 2004-2006)

Crop	Direct Impact	Total Impact
Processing Carrots	\$2,818,000	\$3,728,214
Processing Cucumbers	31,822,000	41,100,506
Processing Snap Beans	9,904,333	13,103,433
Processing Tomatoes	9,612,667	12,717,558
Snap Beans	9,935,000	13,144,005
Cabbage	5,930,333	7,845,831
Carrots	15,134,667	20,023,164
Sweet Corn	15,446,000	20,435,058
Cucumbers	17,868,000	23,639,364
Onions	7,988,333	10,568,565
Tomatoes	21,976,000	29,074,248
Asparagus	14,780,000	19,553,940
Celery	15,209,333	20,131,948
Bell Peppers	10,571,333	13,985,874
Pumpkins	10,519,000	13,916,637
Squash	15,857,000	20,978,811
Other	47,984,333	63,483,273
Total	\$263,356,332	\$347,430,429

**Table 5: Economic Impact of Livestock Production
(Average 2004-2006)**

Commodity	Direct	Total
Cattle	\$285,038,333	\$479,719,515
Dairy	996,725,000	1,359,532,900
Eggs	76,426,667	97,749,707
Hogs	223,456,000	343,004,960
Honey	4,759,000	7,305,065
Horses	256,000,000	392,960,000
Mink	4,759,000	7,305,065
Sheep and Lambs	3,562,000	5,467,670
Trout	788,667	1,210,603
Turkeys	73,072,000	93,459,088
Other Livestock	50,826,667	78,018,933
Total	\$1,975,413,334	\$2,865,733,506

**Table 6: Total Economic Impact of Farming
(Millions)**

Farm Sector	Direct	Total
Field Crops	\$1,911.6	\$2,447.5
Fruit	\$305.3	\$439.0
Vegetables	\$263.4	\$347.4
Livestock	\$1,975.4	\$2,865.7
Floriculture and Nursery	\$646.5	\$1,012.4
Miscellaneous	\$7.5	\$9.9
Total	\$5,109.7	\$7,121.9