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Economic Value of Agriculture to the New York State Economy

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http://agribusiness.dyson.cornell.edu

Cornell Program on Agribusiness & Economic Development

Motivation

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- Growing interest by policymakers and industry leaders in agriculture-based economic development and its potential to support economic vitality of communities across the state.
- Firms are seeking innovative methods to attract new and growing markets for their products, vertically integrate their operations, invest in value-added activities, and develop strategic alliances.
- Such activities suggest growing farm-to-food developments, as well as increased interaction and coordination with others in the agribusiness industry.
- Understanding the economic contributions and evolving linkages is essential in informing appropriate firm, industry, and public policy audiences.

Today's Discussion

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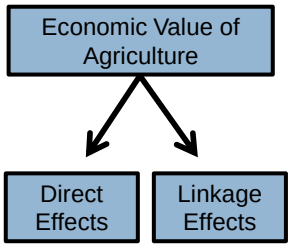
- Farm and food industry trends (direct effects)
- Updated industry multipliers (linkage effects)
- Economic contribution assessment (aggregate analysis)



Simple Model of a Regional Economy

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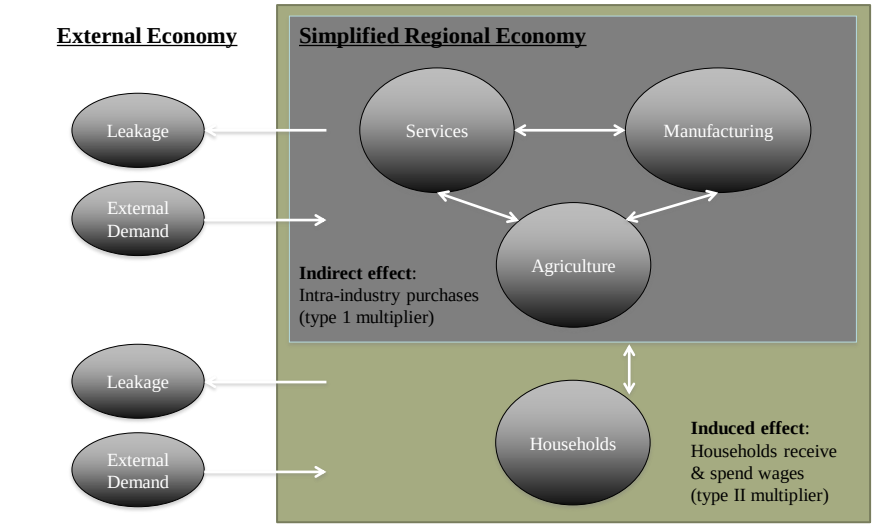

Source: Rebeiro and Warner, 2004

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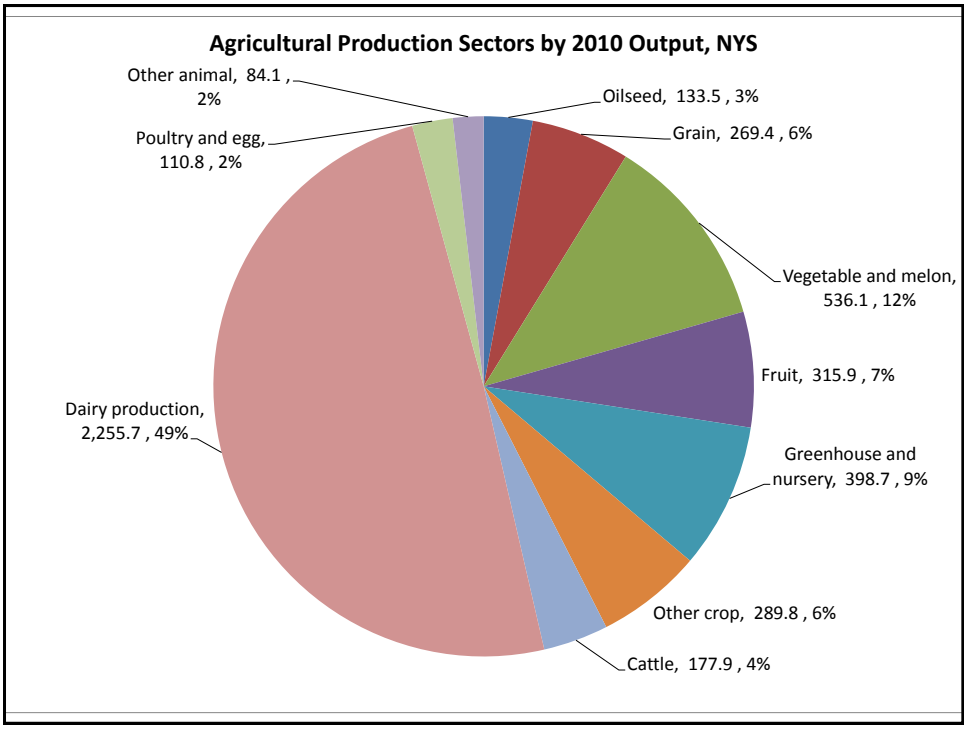
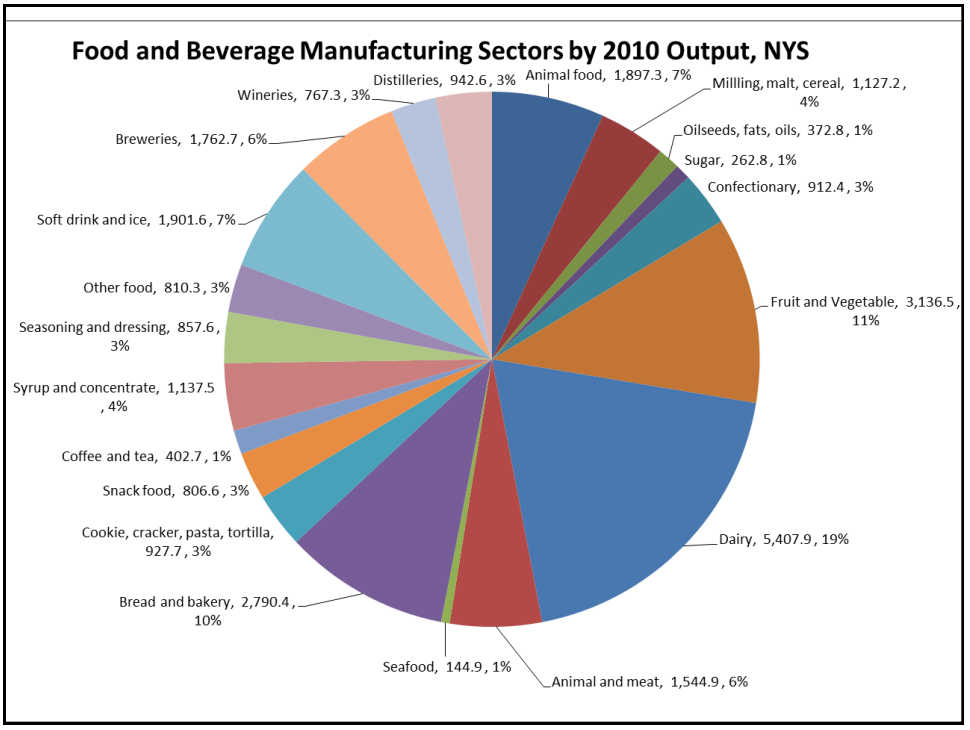
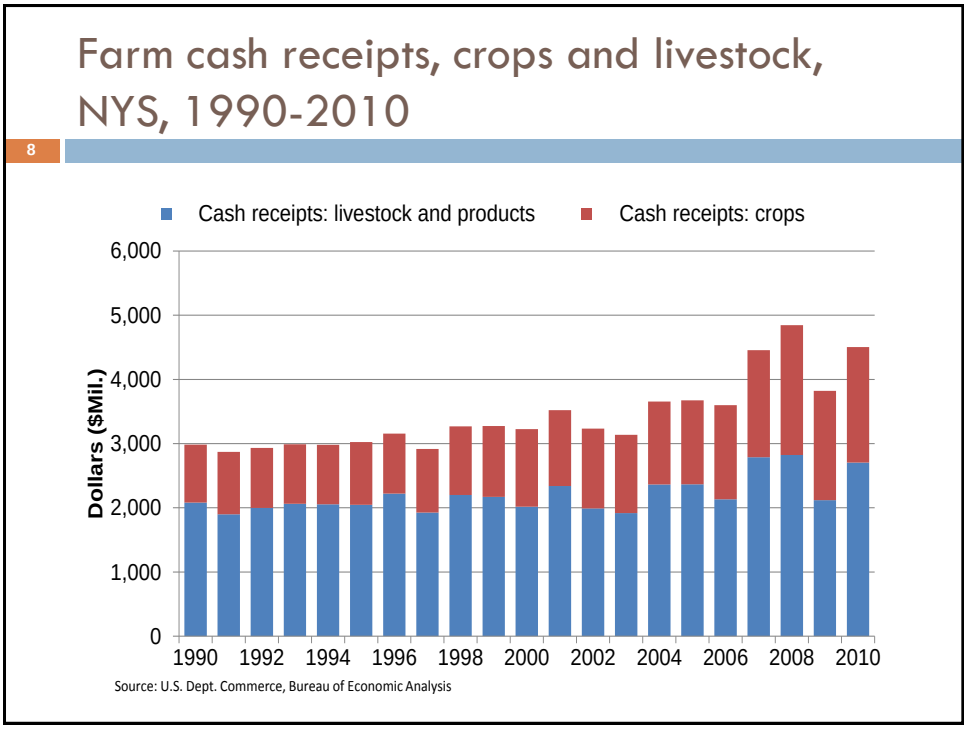
Direct Effects




Food and Beverage Manufacturing Sectors by 2010 Output, NYS
Distilleries, 942.6, 3%
Animal food, 1,897.3, 7%
Wineries, 767.3, 3%
Millling, malt, cereal, 1,127.2, 4%
Breweries, 1,762.7, 6%
Oilseeds, fats, oils, 372.8, 1%
Sugar, 262.8, 1%
Confectionary, 912.4, 3%
Soft drink and ice, 1,901.6, 7%
Other food, 810.3, 3%
Fruit and Vegetable, 3,136.5, 11%
Seasoning and dressing, 857.6, 3%
Syrup and concentrate, 1,137.5, 4%
Coffee and tea, 402.7, 1%
Snack food, 806.6, 3%
Dairy, 5,407.9, 19%
Cookie, cracker, pasta, tortilla, 927.7, 3%
Bread and bakery, 2,790.4, 10%
Seafood, 144.9, 1%
Animal and meat, 1,544.9, 6%


Farm cash receipts, crops and livestock, NYS, 1990-2010
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Cash receipts: livestock and products
Cash receipts: crops
Dollars ($Mil.)
6,000
5,000
4,000
3,000
2,000
1,000
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
Source: U.S. Dept. Commerce, Bureau of Economic Analysis

Full and part-time employment, NYS, 1990-2010

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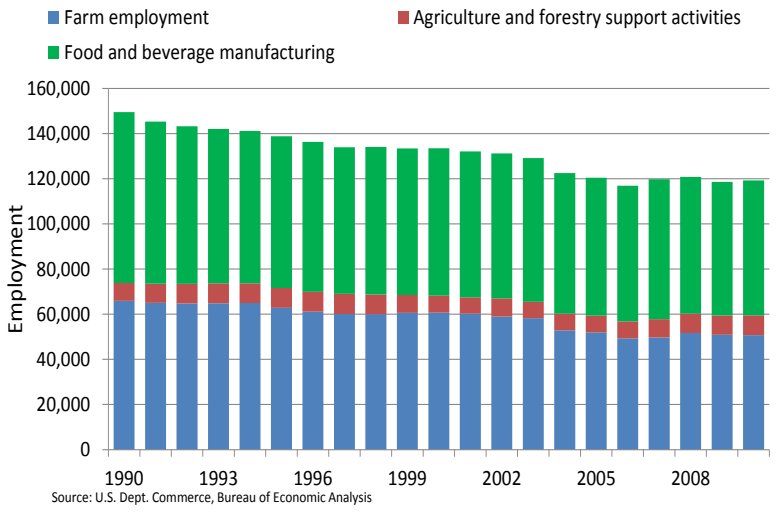

Source: U.S. Dept. Commerce, Bureau of Economic Analysis

Gross State Product originating in food and agriculture, NYS 1990-2010

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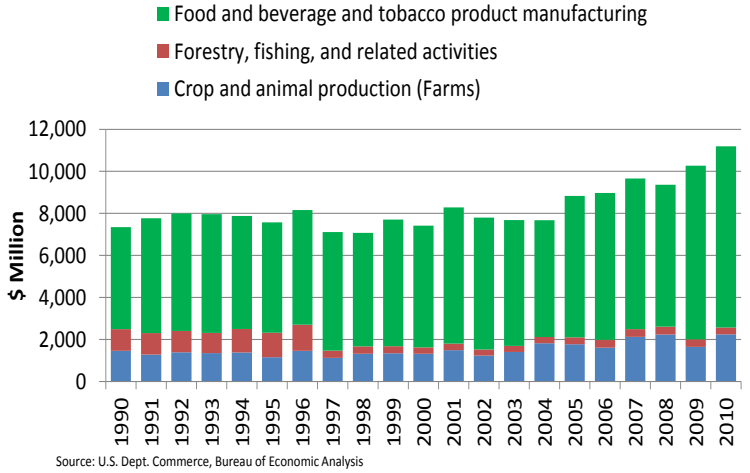

Source: U.S. Dept. Commerce, Bureau of Economic Analysis

Gross State Product originating in crop and livestock production, NYS, 1997-2010

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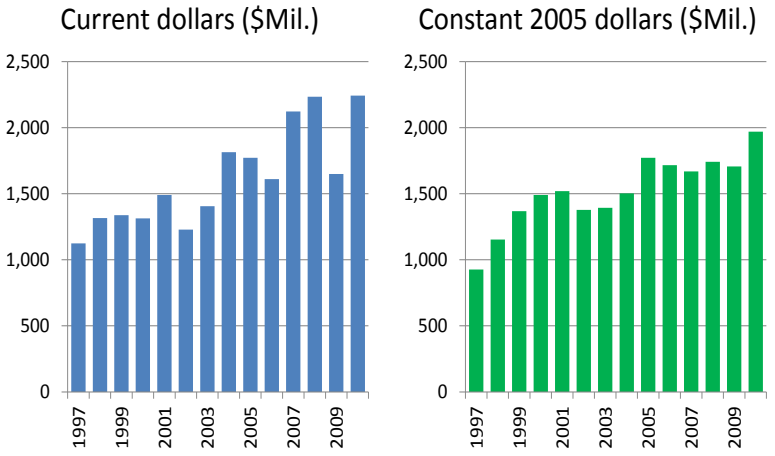

Source: US Dept. Commerce, Bureau of Economic Analysis

Gross State Product originating in food and beverage manufacturing, NYS, 1997-2010

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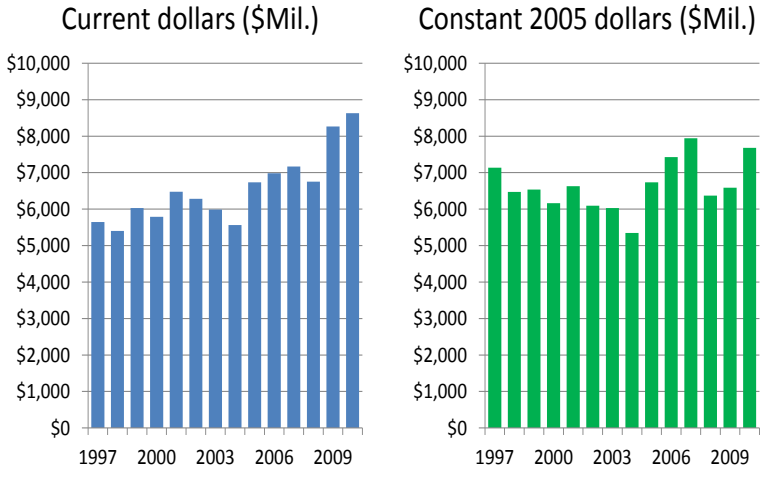

Source: US Dept. Commerce, Bureau of Economic Analysis

13 Linkage Effects

Multipliers

- Describe the response of the economy to a change in economic activity and estimate changes in output, employment, income and value added
- Derived only from 'local' transactions
- Made up of direct, indirect and induced impacts

Agriculture's Linkage Effects

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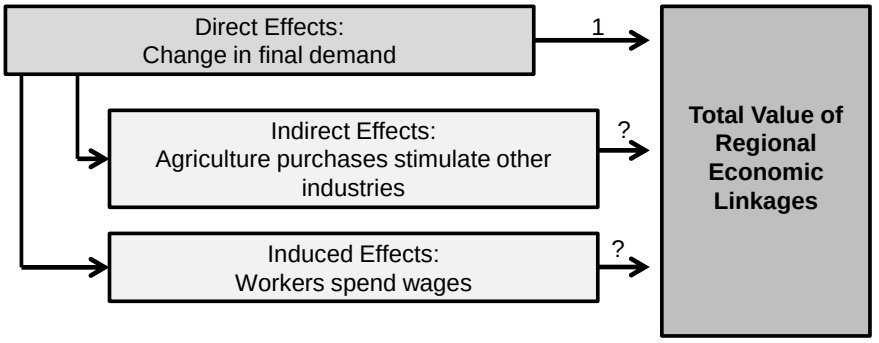

Note, final demand includes consumption, investment, government, and exports; i.e., that portion of demand that is not used in the production of other outputs inside the economy (intermediate demand).

Source: Rebeiro and Warner, 2004

Output multipliers for selected farm and food sectors, NYS, 2010

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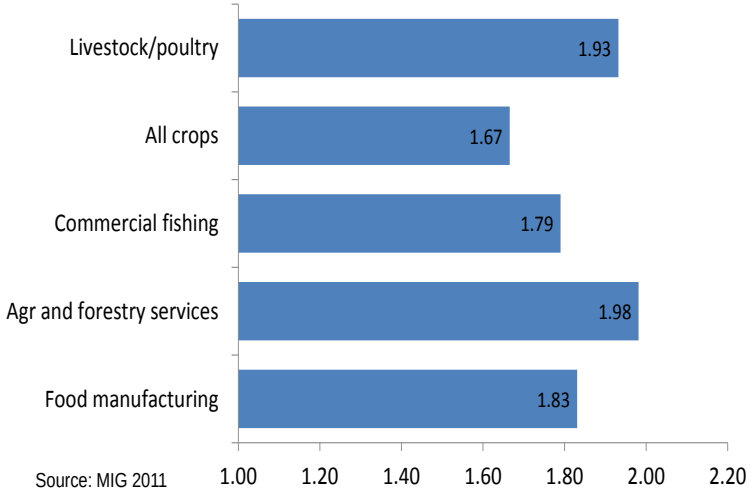

Source: MIG 2011

Output multipliers for selected industrial sectors, NYS, 2010

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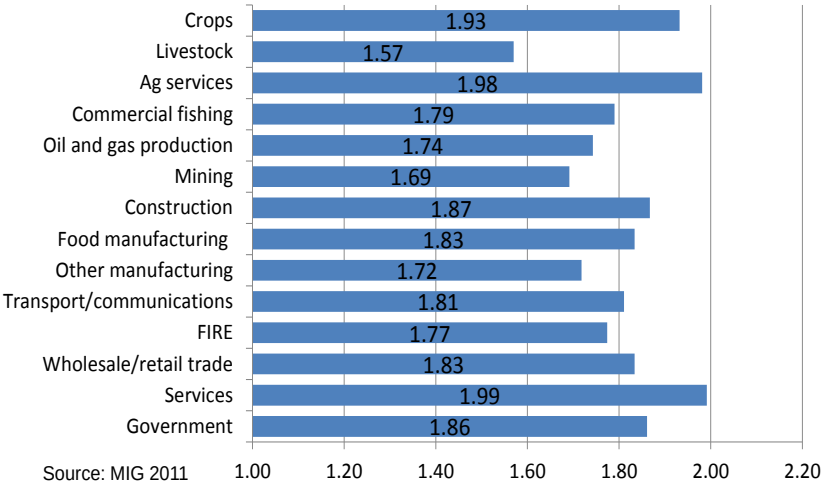

Employment multipliers for selected farm and food sectors, NYS, 2010

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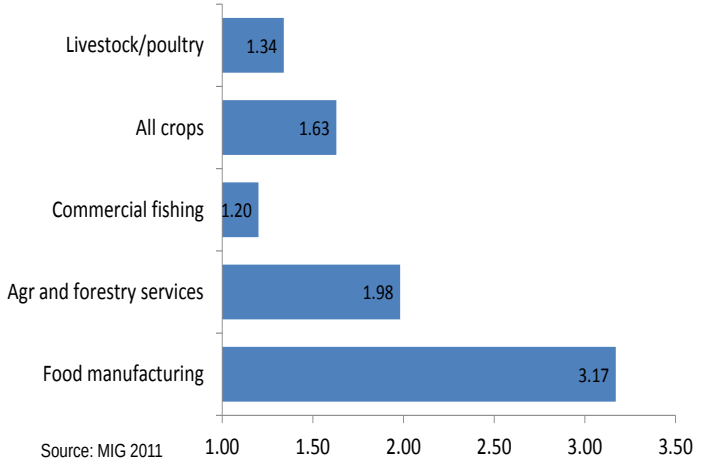

Employment multipliers for selected industrial sectors, NYS, 2010

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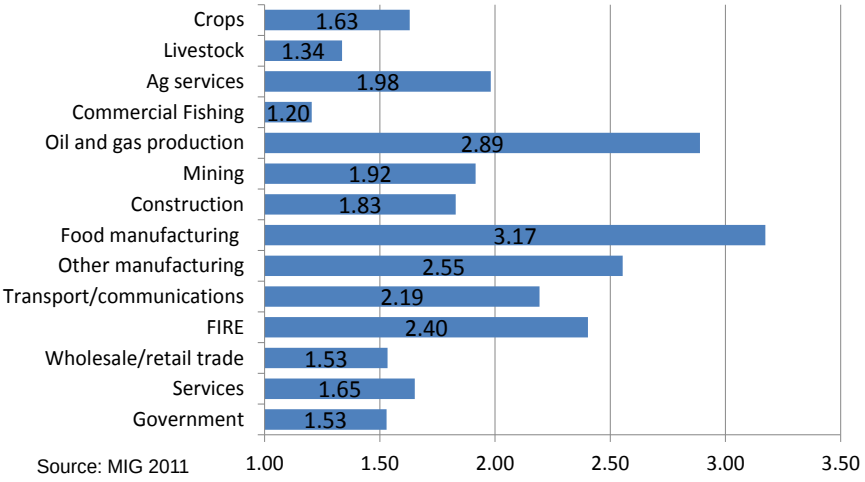

Source: MIG 2011

Individual farm sector multipliers

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Description	Output	Employment
Oilseed farming	1.70	1.30
Grain farming	1.99	1.26
Vegetable and melon farming	1.95	2.04
Fruit farming	1.96	1.95
Greenhouse, nursery, and floriculture production	1.91	1.63
All other crop farming	1.97	2.09
Cattle ranching and farming	1.74	1.48
Dairy cattle and milk production	1.67	1.40
Poultry and egg production	1.71	2.44
Animal production, except cattle and poultry and eggs	1.61	1.13
Commercial Fishing	1.79	1.20
Support activities for agriculture and forestry	1.98	1.25

Source: MIG 2011

Individual food and beverage manufacturing multipliers

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Description	Output	Employment
Dog and cat food	1.52	4.66
Other animal food	1.59	4.93
Flour milling	1.84	8.20
Fats and oils	1.45	4.79
Sugar fining	1.68	4.10
Confectionery -chocolate	1.65	2.19
Nonchocolate confectionery	1.67	2.22
Frozen food	1.78	2.47
Fruit and vegetable s	1.73	2.95
Fluid milk and butter	2.18	5.67
Cheese	2.17	6.58
Dry, condensed, and evaporated dairy products	2.05	7.86
Ice cream and frozen dessert	1.96	3.01
Animal processing	1.66	3.10

Description	Output	Employment
Poultry processing	1.55	1.71
Seafood products	1.65	2.57
Bread and bakery products	1.91	1.87
Cookie, cracker, and pasta manufacturing	1.79	2.70
Snack foods	1.63	3.40
Coffee and tea manufacturing	1.75	3.91
Flavoring syrup and concentrate	1.63	5.25
Seasoning and dressing manufacturing	1.84	3.39
All other food manufacturing	1.80	2.51
Soft drink and ice manufacturing	1.79	3.34
Breweries	1.53	4.14
Wineries	1.78	2.57
Distilleries	1.32	5.31

Source: MIG 2011

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Economic Contribution Analysis

IMPLAN

- IMpact Analysis for PLANning is the dominant source of IO/SAM data and software employment for economic impact analyses
- Data sources: BEA, Census, USDA, etc.
- Benefits:
  - Data includes complete model of economy (interindustry transactions)
  - Data available by county and zip code
  - Data modifiable, allows user to build unique industry sectors

Contribution Analysis

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- An economic industry contribution analysis describes that portion of a region's economy that can be attributed to an existing industry.
- Uses data internal to the model to identify all backward linkages in the study area related to the industry.
- Results, when compared with the entire economy, offer insights into the relative extent and magnitude of the industry in the study area.

Contribution of Agricultural Production Sectors

25

Output ($ Million)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
Grain, Oilseed, Other Crops	693	417	210	1,320	1.90
Fruit and Vegetable	852	373	431	1,656	1.94
Greenhouse and Nursery	399	76	275	749	1.88
Beef, Poultry, Other Animal	373	150	79	603	1.62
Dairy	2,256	1,093	401	3,751	1.67
All Agricultural Production	4,572	1,962	1,369	7,903	1.73

Total Ag Sector Sales | Total Ag Supply Chain Sales | Total Labor Spending Sales | Total Sales Contribution

Contribution of Agricultural Production Sectors

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Dairy	2,256	1,093	401	3,751	1.67
All Agricultural Production	4,572	1,962	1,369	7,903	1.73

Employment (Jobs)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
Grain, Oilseed, Other Crops	10,355	2,655	1,419	14,429	1.39
Fruit and Vegetable	6,070	3,120	2,912	12,102	1.99
Greenhouse and Nursery	3,986	572	1,855	6,412	1.61
Beef, Poultry, Other Animal	4,732	762	534	6028	1.27
Dairy	20,155	5,300	2,702	28,157	1.40
All Agricultural Production	45,298	11,104	9,225	65,627	1.45

Total Ag Sector | Total Supply Chain | Total Labor Spending | Total Contribution

Contribution of NYS Dairy Industries (production and manufacturing)

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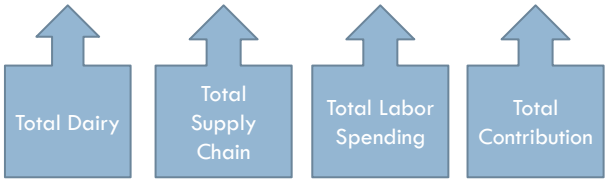
Output ($ Million)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
Dairy Production	2,256	1,093	401	3,751	1.67
Dairy Processing	5,408	3,953	1,257	10,617	1.96
All Dairy	7,664	2,501	1,354	11,519	1.50

Employment (Jobs)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
Dairy Production	20,155	5,300	2,702	28,157	1.40
Dairy Processing	8,073	25,989	8,473	42,535	5.27
All Dairy	28,228	11,966	9,126	49,320	1.75

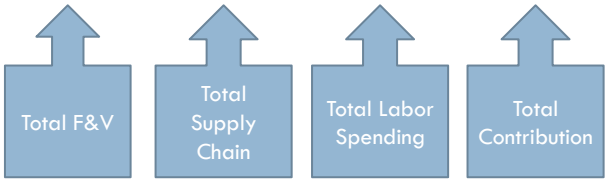


Contribution of NYS Fruit & Vegetable Industries (production and manufacturing)

28

Output ($ Million)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
F&V Production	852	373	431	1,656	1.94
F&V Processing	3,137	1,427	799	5,362	1.71
All F&V	3,989	1,714	1,197	6,900	1.73

Employment (Jobs)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
F&V Production	6,070	3,120	2,912	12,102	1.99
F&V Processing	6,957	6,297	5,377	18,631	2.68
All F&V	13,027	8,781	8,074	29,882	2.29



Contribution of NYS Animal/Meat (nondairy) Industries (production and manufacturing)

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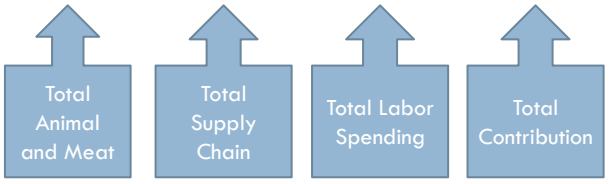
Output ($ Million)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
Animal Production	373	150	79	603	1.62
Animal Processing	1,545	591	331	2,467	1.60
All Animal (nondairy)	1,918	507	376	2,801	1.46

Employment (Jobs)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
Animal Production	4,732	762	534	6028	1.27
Animal Processing	3,817	4,302	2,227	10,346	2.71
All Animal (nondairy)	8,549	2,585	2,533	13,668	1.60



Contribution of NYS Agriculture (production, support services, manufacturing)

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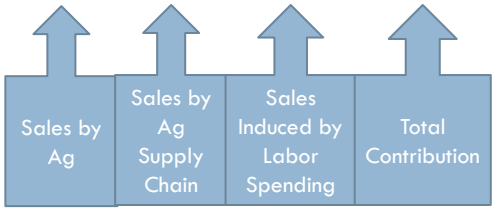
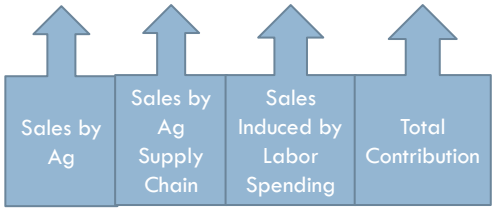
Output ($ Million)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
Agricultural production sectors	4,572	1,962	1,369	7,903	1.73



Contribution of NYS Agriculture (production, support services, manufacturing)

31

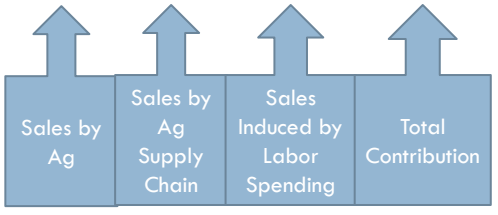
Output ($ Million)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
Agricultural production sectors	4,572	1,962	1,369	7,903	1.73
Agricultural and forestry support services	349	67	276	692	1.98



Contribution of NYS Agriculture (production, support services, manufacturing)

32

Output ($ Million)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
Agricultural production sectors	4,572	1,962	1,369	7,903	1.73
Agricultural and forestry support services	349	67	276	692	1.98
Agricultural processing sectors	29,275	12,083	6,451	47,809	1.63



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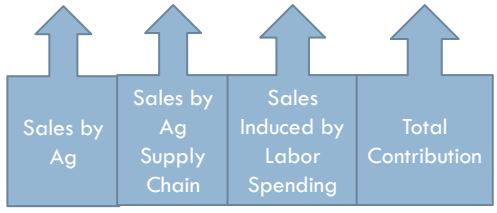
All agriculture sectors combined	34,196	10,287	7,371	51,854	1.52



Contribution of NYS Agriculture (production, support services, manufacturing)

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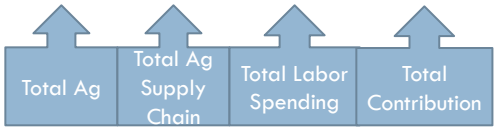
Agricultural processing sectors	29,275	12,083	6,451	47,809	1.63
All agriculture sectors combined	34,196	10,287	7,371	51,854	1.52

Employment (Jobs)	Direct Effect	Indirect Effect	Induced Effect	Total Effect	Implicit Multiplier
Agricultural production sectors	45,298	11,104	9,225	65,627	1.45
Agricultural and forestry support services	8,553	249	1,863	10,664	1.25
Agricultural processing sectors	58,170	70,940	43,972	173,082	2.98
All agriculture sectors combined	112,095	48,990	50,231	211,316	1.89



Conclusions

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- Multiplier effects suggest that ag-based industries can have relatively large generative effects on the NYS economy, although significant variation exists across sectors.
- Individual sector multipliers can help set priorities on development initiatives (i.e., sectors to improve performance) and/or to highlight sectors to sustain performance (i.e., currently strong performing sectors to sustain)
- Economic contribution analysis provides a useful mechanism in documenting and communicating agriculture's value to the NYS economy.

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Thank You!

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