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Charles H. Dyson School of  
Applied Economics and Management

# **Trends and Economic Impacts of Food & Beverage Manufacturing In NYS**

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*Agricultural and Food Business Outlook*

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## *Outline*

- Where are we now? Economic contribution analysis
- Where have we been? Trends and industry comparisons
- Backward linkages: economic multipliers
- Forward linkages: commodity destination, supply to demand ratios



## ***Agriculture Contribution Analysis 2014***

- How define “agriculture”? Focus on ag and food production.
- What’s there? What isn’t (data limitations)?
- NYS is a big economy (hint: NYC).
- Variation and importance across local regions
- Implications of marginal changes; i.e., next dollar of investment

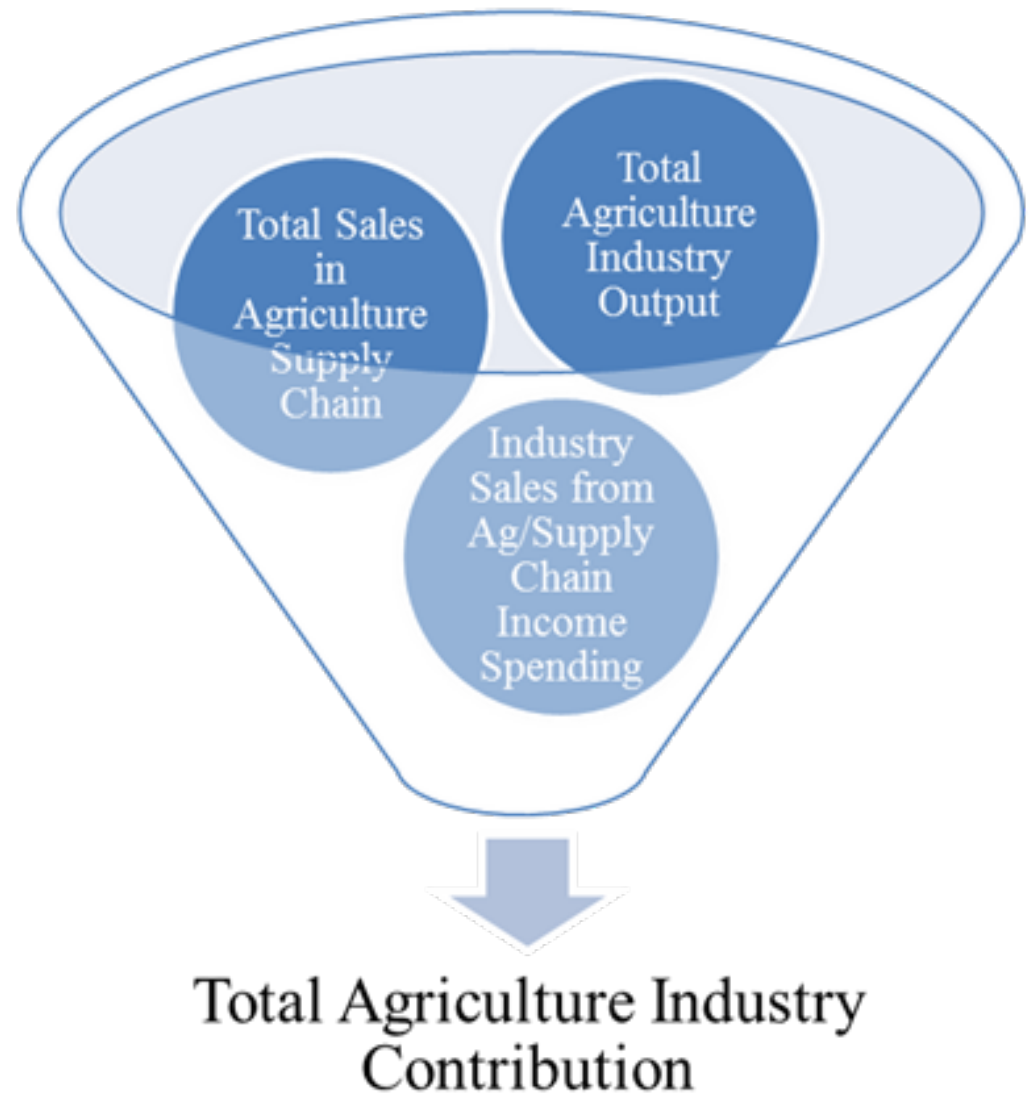


### **The Agriculture Industry:**

- (i) On-farm agricultural production,
- (ii) Agricultural support services, and
- (iii) Agricultural processing industries

### **Contribution Analysis:**

- (i) Direct effects
- (ii) Indirect effects (supply chain)
- (iii) Induced effects (labor income spending)
- (iv) Total effects,  $i+ii+iii$





## ***Agriculture's Direct Effects Relative to the Total Economy***

| <b>Region</b>    | <b>Employment</b> | <b>Output</b> | <b>Value Added</b> |
|------------------|-------------------|---------------|--------------------|
| New York State   | 1.23%             | 2.09%         | 1.00%              |
| Capital District | 1.49%             | 2.67%         | 1.49%              |
| Central New York | 2.19%             | 4.14%         | 2.62%              |
| Finger Lakes     | 3.17%             | 7.90%         | 5.44%              |
| Long Island      | 0.75%             | 1.23%         | 0.65%              |
| Mid-Hudson       | 1.20%             | 2.35%         | 1.19%              |
| Mohawk Valley    | 3.14%             | 6.42%         | 3.38%              |
| New York City    | 0.53%             | 0.61%         | 0.27%              |
| North Country    | 3.65%             | 6.47%         | 3.73%              |
| Southern Tier    | 3.58%             | 6.78%         | 3.38%              |
| Western New York | 2.45%             | 5.61%         | 2.39%              |

Source: IMPLAN, LLC 2016



### ***Agriculture's Total Effects Relative to the Total Economy***

| Region           | Employment | Output | Value Added |
|------------------|------------|--------|-------------|
| New York State   | 2.13%      | 2.97%  | 1.89%       |
| Capital District | 2.59%      | 3.79%  | 2.82%       |
| Central New York | 3.78%      | 5.88%  | 4.95%       |
| Finger Lakes     | 5.49%      | 11.21% | 10.28%      |
| Long Island      | 1.29%      | 1.75%  | 1.23%       |
| Mid-Hudson       | 2.08%      | 3.33%  | 2.25%       |
| Mohawk Valley    | 5.44%      | 9.12%  | 6.39%       |
| New York City    | 0.91%      | 0.87%  | 0.51%       |
| North Country    | 6.31%      | 9.19%  | 7.06%       |
| Southern Tier    | 6.20%      | 9.63%  | 6.39%       |
| Western New York | 4.25%      | 7.97%  | 4.52%       |

Source: IMPLAN, LLC 2016; using state-level implied multipliers (Schmit 2016)



## ***Economic contribution of agriculture on the NYS economy, 2014.***

| <b>Aggregate Sector</b>               | <b>Direct</b> | <b>Indirect</b> | <b>Induced</b> | <b>Total</b> | <b>Implicit Multiplier</b> |
|---------------------------------------|---------------|-----------------|----------------|--------------|----------------------------|
| <b>Industry Output (\$ million)</b>   |               |                 |                |              |                            |
| <b>Agricultural Production</b>        | 6,665         | 1,310           | 1,660          | 9,635        | 1.45                       |
| <b>Agricultural Support Services</b>  | 304           | 41              | 148            | 493          | 1.62                       |
| <b>Agricultural Manufacturing</b>     | 37,844        | 15,080          | 6,697          | 59,621       | 1.58                       |
| <b>All Agriculture</b>                | 44,813        | 11,499          | 7,536          | 63,849       | 1.42                       |
| <b>Employment (jobs)</b>              |               |                 |                |              |                            |
| <b>Agricultural Production</b>        | 54,484        | 8,898           | 11,294         | 74,675       | 1.37                       |
| <b>Agricultural Support Services</b>  | 7,088         | 181             | 1,009          | 8,278        | 1.17                       |
| <b>Agricultural Manufacturing</b>     | 83,757        | 77,718          | 45,963         | 207,437      | 2.48                       |
| <b>All Agriculture</b>                | 145,328       | 54,458          | 51,683         | 251,469      | 1.73                       |
| <b>Total Value Added (\$ million)</b> |               |                 |                |              |                            |
| <b>Agricultural Production</b>        | 3,941         | 748             | 1,102          | 5,791        | 1.47                       |
| <b>Agricultural Support Services</b>  | 221           | 23              | 98             | 342          | 1.55                       |
| <b>Agricultural Manufacturing</b>     | 9,606         | 9,240           | 4,481          | 23,327       | 2.43                       |
| <b>All Agriculture</b>                | 13,768        | 7,270           | 5,042          | 26,081       | 1.89                       |

Source: IMPLAN, LLC (2016)



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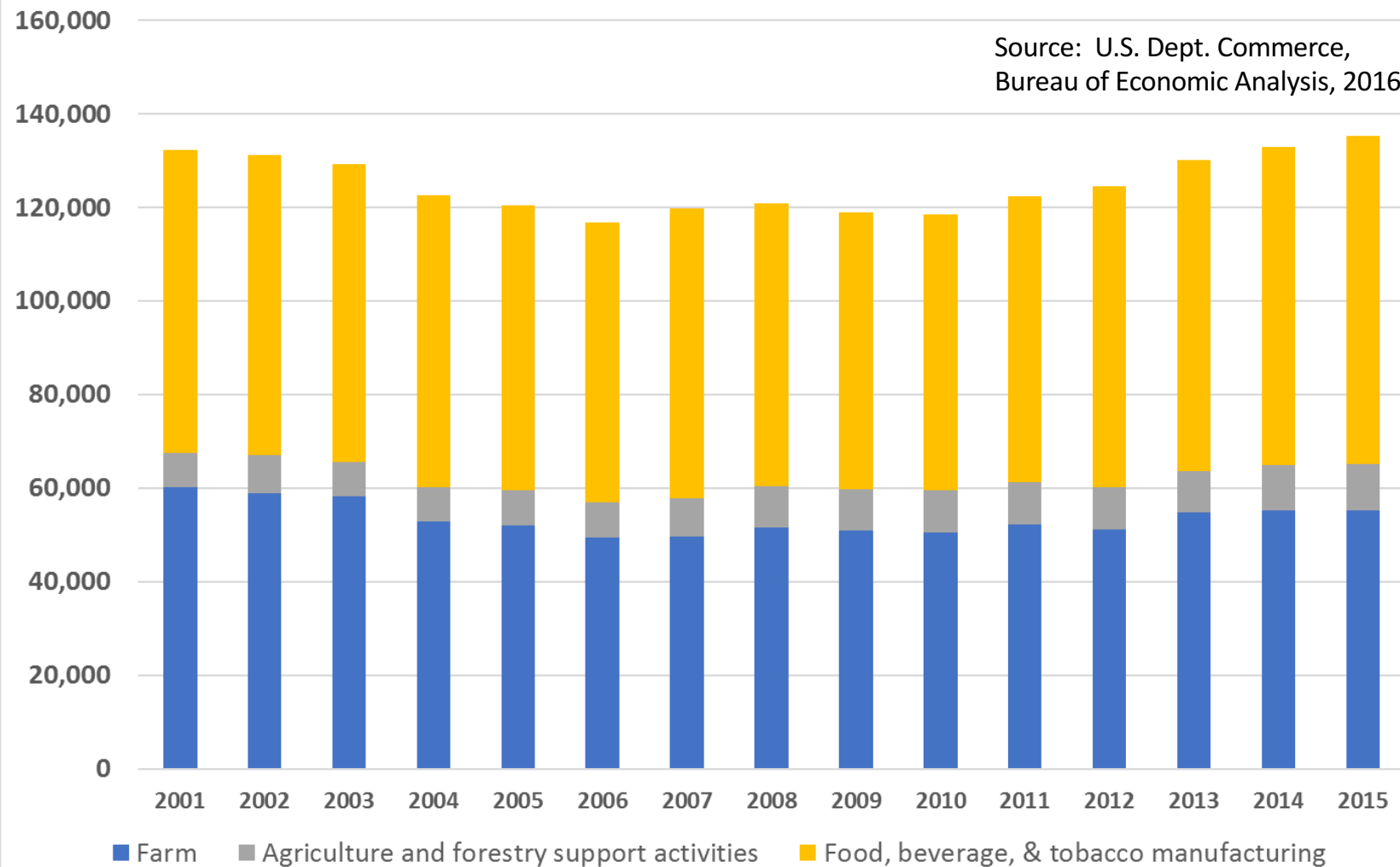
# ***Industry Trends in Food and Agriculture***





## Employment Originating in Food and Agriculture New York State, 2001-2015

Source: U.S. Dept. Commerce,  
Bureau of Economic Analysis, 2016



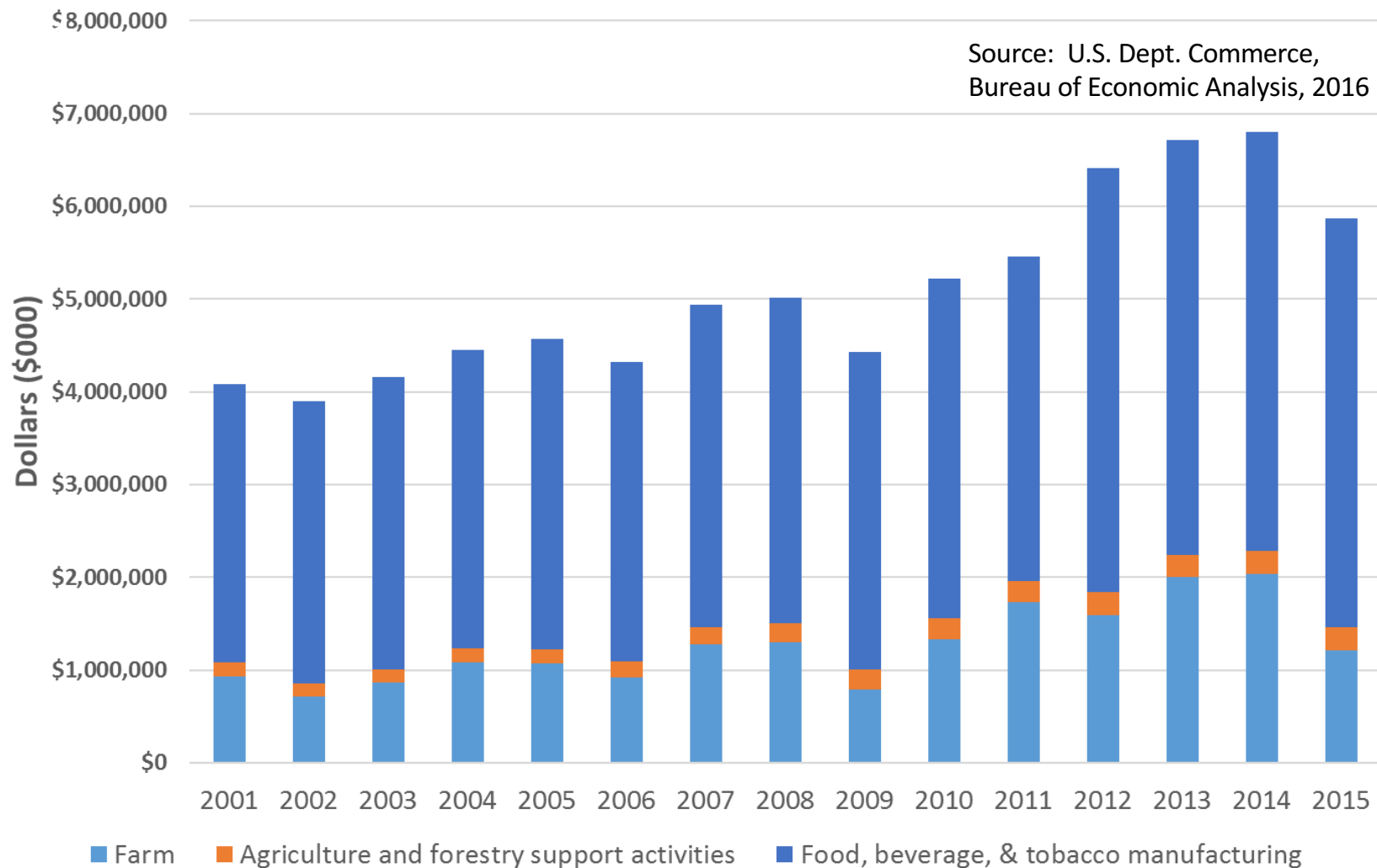


## ***Industry Trends – Employment***

- Ag employment since 2010:
  - Farm: Up 9% farm
  - Farm Services: Up 10%
  - Ag and Food Manufacturing: Up 19%
- Comparison with other sectors:
  - All NYS industries: Up 11%
  - Durable goods manufacturing: Up only 0.3%
  - Nondurable goods manufacturing (excl. food): Down 2%



## Earnings Originating in Food and Agriculture New York State, 2001-2015



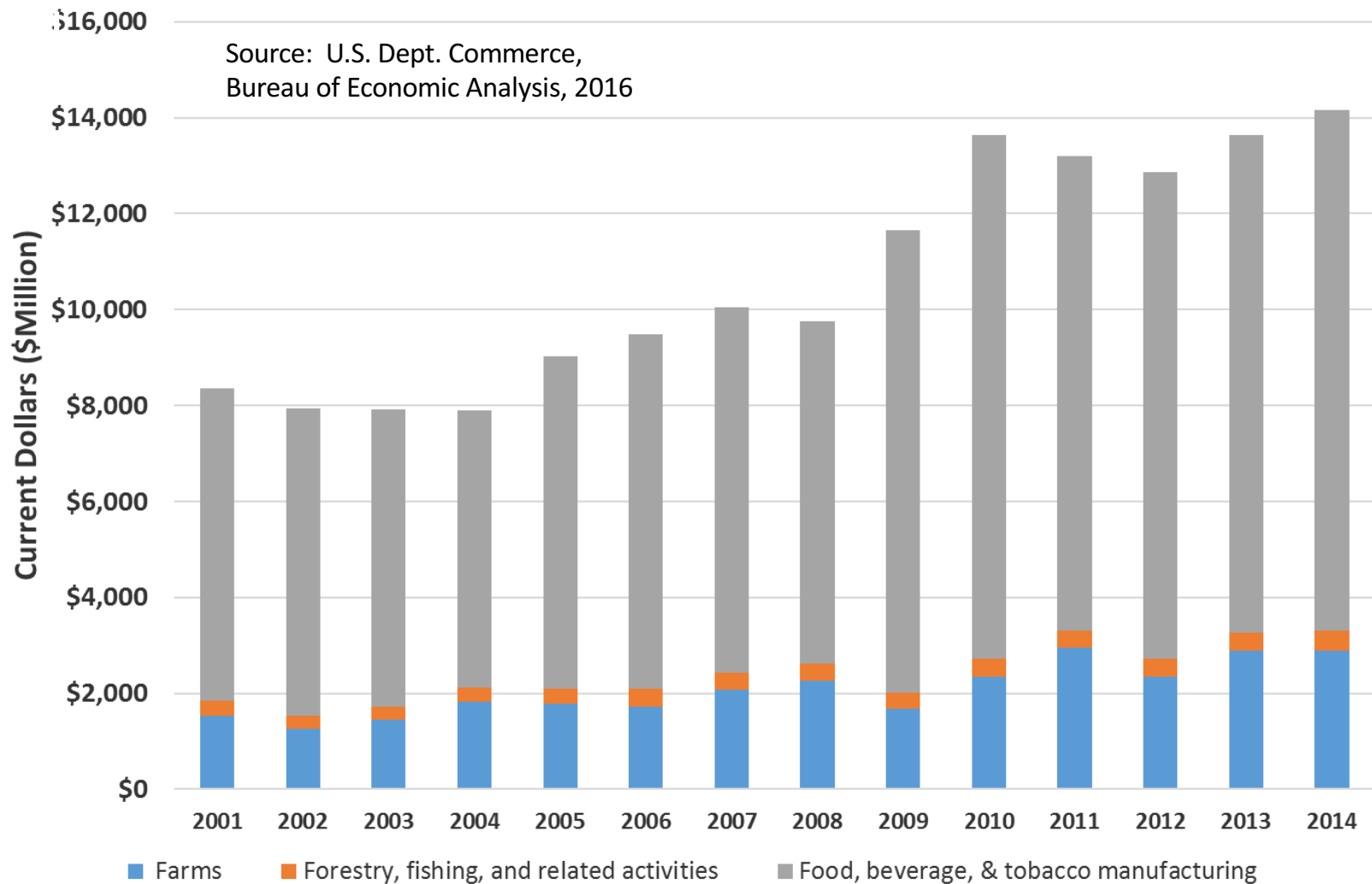


## ***Industry Trends - Earnings***

- Ag earnings since 2010:
  - Farm: Down 9% (Proprietor income down 36%, Wages up 26%)
  - Farm services: Up 5%
  - Ag and Food Manufacturing: up 21%
- Comparison with other sectors:
  - Nonfarm earnings: Up 19%
  - Durable goods manufacturing: Up 13%
  - Nondurable goods manufacturing (excl. food): Up 6%

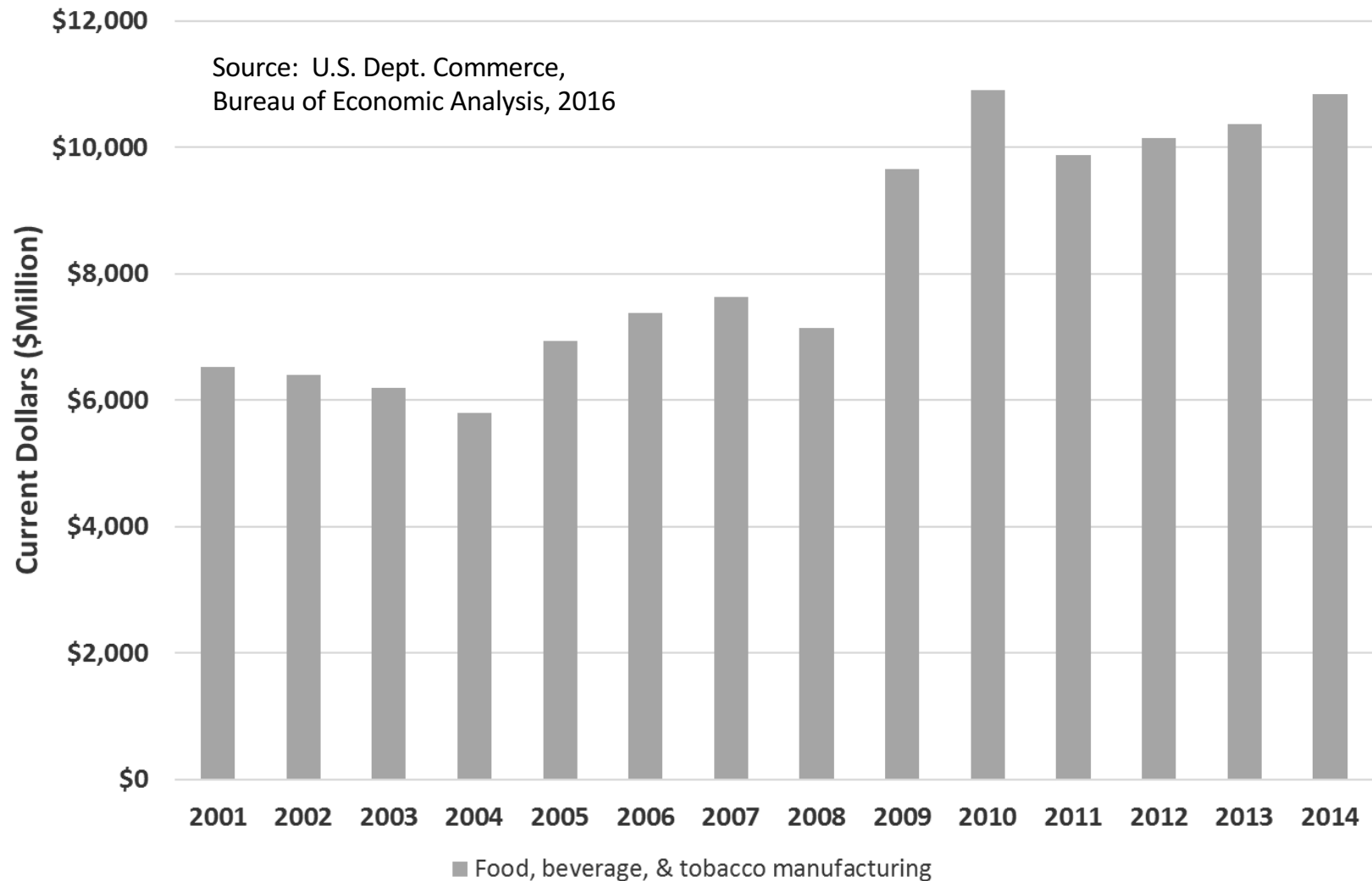


## Gross State Product Originating in Food & Agriculture Production New York State, 2001-2014





## Gross State Product Originating in Food & Beverage Manufacturing, New York State, 2001-2014





## ***Industry Trends – Gross State Product (Value Added)***

- Ag GSP since 2010 to **2014**:
  - Farm: Up 23% (will be lower in 2015)
  - Ag and Food Manufacturing: Down 0.5%
    - But strong rebound since 2011
    - Will be higher in 2015 with strong earnings growth (prior slide)
- Comparison with other sectors:
  - All industries: Up 15%
  - Durable goods manufacturing: Up 11%
  - Nondurable goods manufacturing (without food): Down 15%



## ***Manufacturing in New York State, 2014***

| Sector     | Employment | Output<br>(\$M) | Labor Income<br>(\$M) | TVA<br>(\$M) |
|------------|------------|-----------------|-----------------------|--------------|
| Total      | 491,939    | \$211,624       | \$33,094              | \$55,759     |
| F&B        | 82,031     | \$ 36,466       | \$ 4,361              | \$ 9,286     |
| F&B Share  | 17%        | 17%             | 12%                   | 14%          |
| %ChNonF&B* | -4%        | -3%             | -1%                   | -9%          |
| %ChF&B*    | +44%       | +29%            | +43%                  | +55%         |

\*Percentage change in the last five years (2009), Food & Bev versus all other manufacturing

Source: IMPLAN, LLC 2016





## ***Industry Trends – Manufacturing in NYS***

- If look at disaggregate categories (~ 3 digit NAICS), growth metrics in last five years (2009-2014) are impressive:
  - 2<sup>nd</sup> in employment growth (39%)
    - To small tobacco manufacturing sector (84%)
  - 3<sup>rd</sup> in output growth (29%)
    - Close behind wood products (36%) & plastics/rubber (31%), both much smaller industries
  - 1<sup>st</sup> in earnings growth (43%)
  - 2<sup>nd</sup> in GSP growth (55%)
    - To textiles and apparel (98%), a MUCH smaller industry

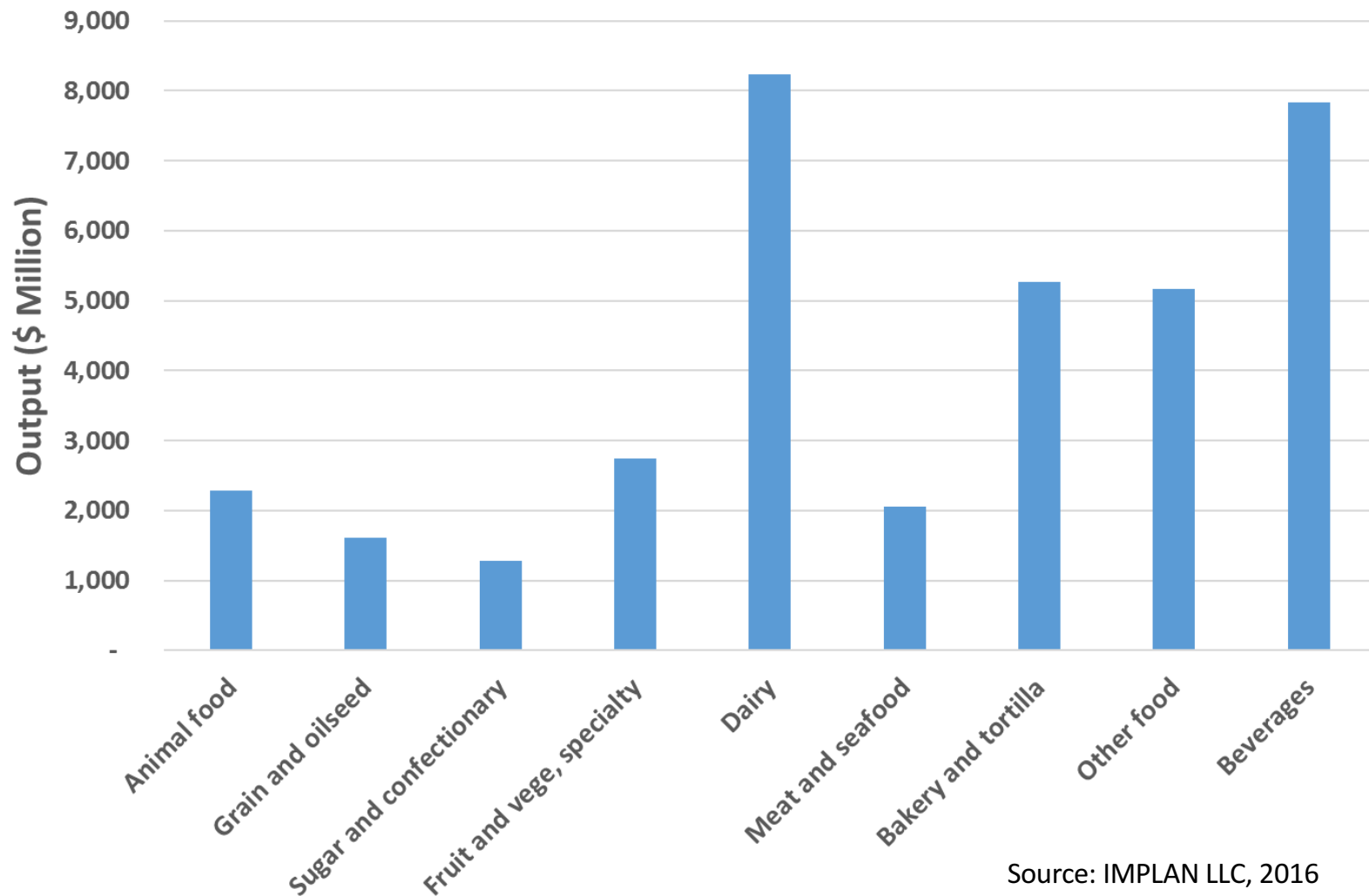


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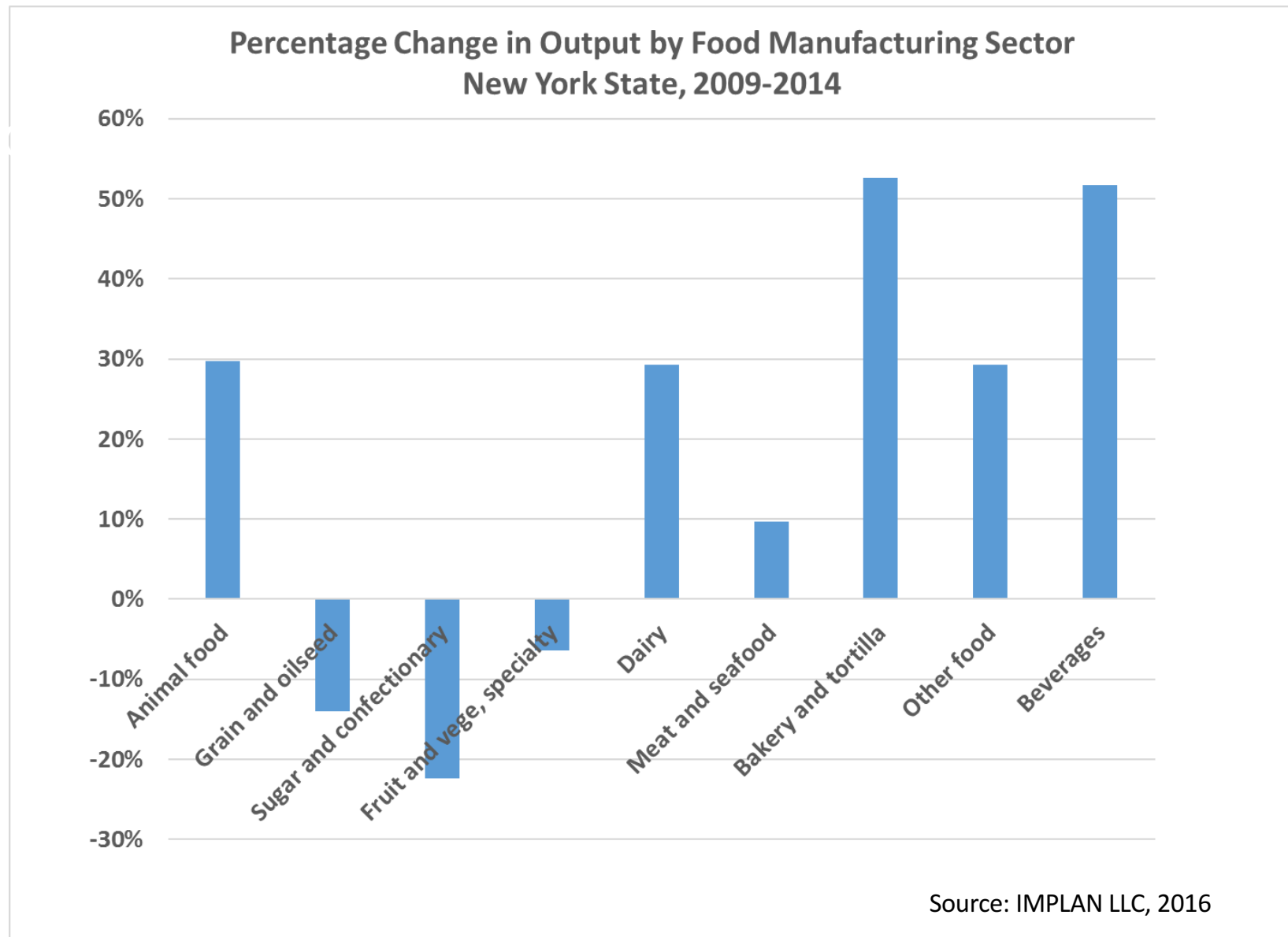
# ***Subsector Trends in Food and Beverage Manufacturing***



### Total Value of Output by Food Manufacturing Sector New York State, 2014

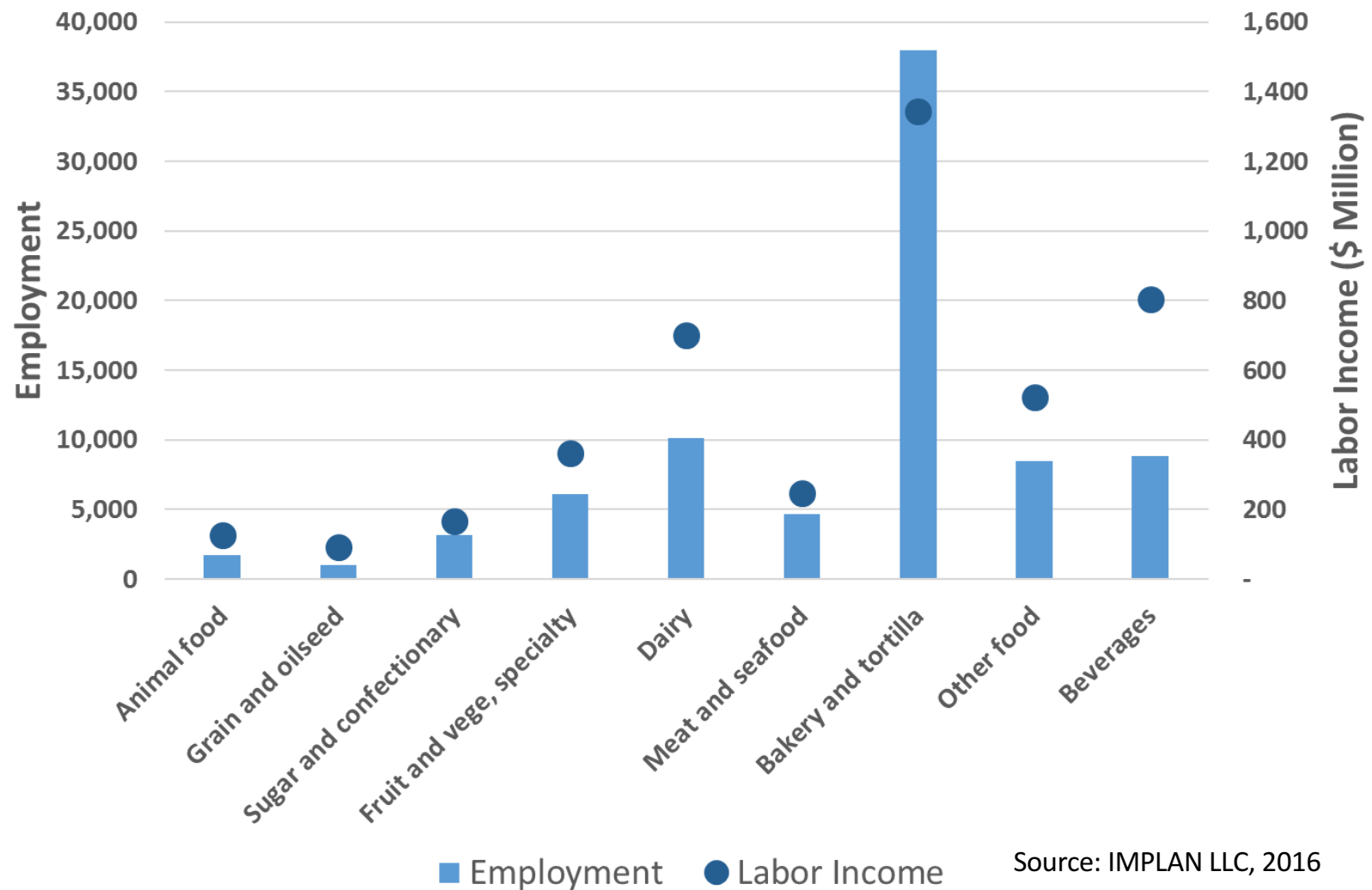


Source: IMPLAN LLC, 2016





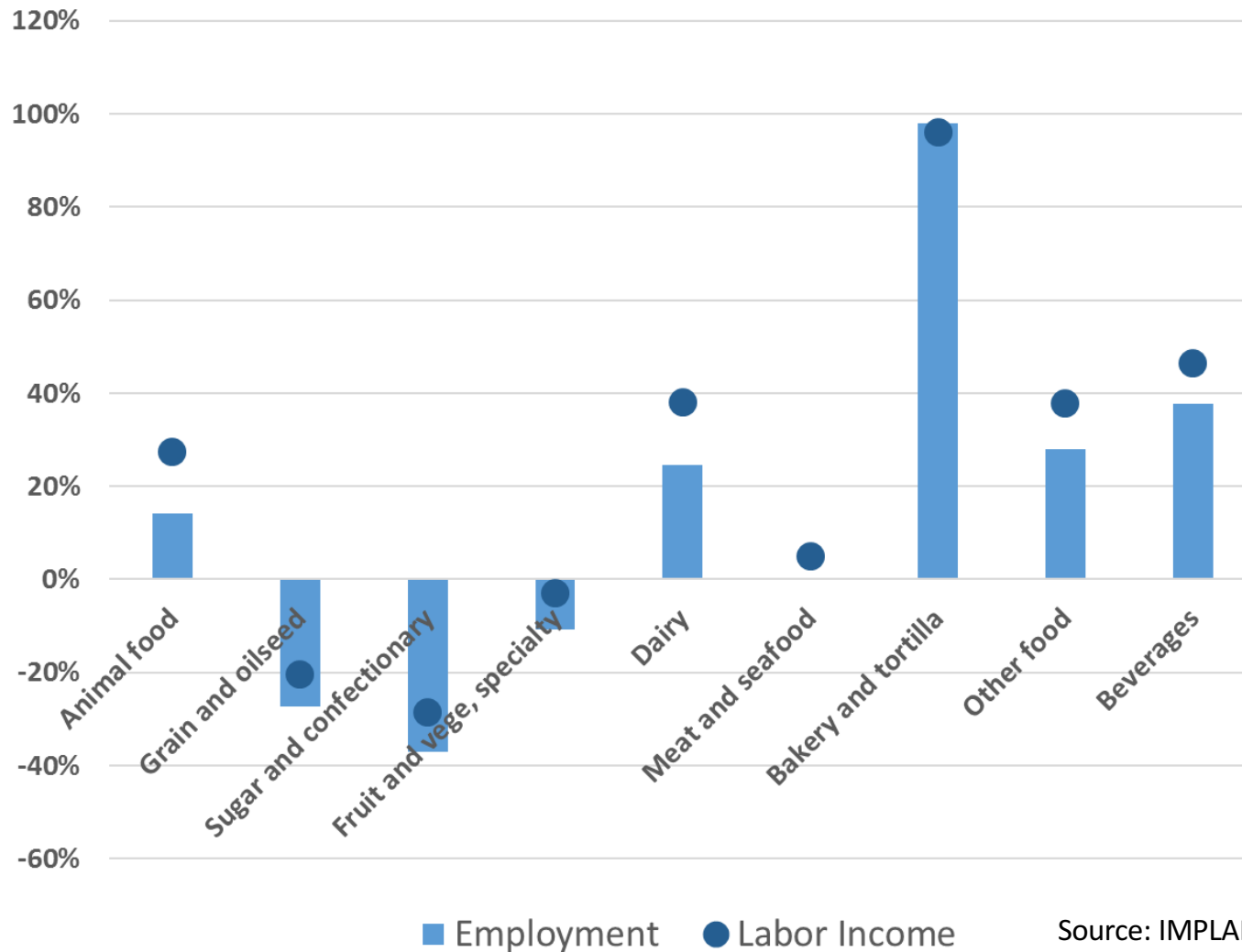
### Employment and Labor Income by Food Manufacturing Sector New York State, 2014



Source: IMPLAN LLC, 2016



### Percentage Change in Employment and Labor Income by Food Manufacturing Sector, New York State, 2009-2014



Source: IMPLAN LLC, 2016



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# ***Economic Multipliers in Food and Beverage Manufacturing***



## Economic Multipliers – Food Manufacturing Sectors, New York State, 2014

| Sector          | Employment | Output | Labor Income | TVA  |
|-----------------|------------|--------|--------------|------|
| Animal Food     | 4.33       | 1.54   | 4.19         | 3.47 |
| Grain/Oilseed   | 5.40       | 1.58   | 4.48         | 3.77 |
| Sugar/Confect   | 2.29       | 1.62   | 2.72         | 2.88 |
| Fruit/Vege/Spec | 2.43       | 1.63   | 2.67         | 3.13 |
| Dairy           | 4.85       | 2.01   | 4.48         | 5.66 |
| Meat/seafood    | 2.81       | 1.51   | 2.22         | 2.68 |
| Bakery/Tortilla | 1.47       | 1.64   | 1.94         | 1.94 |
| Bev - NonAlc    | 3.14       | 1.60   | 2.73         | 2.73 |
| Bev - Alc       | 2.87       | 1.40   | 2.48         | 1.41 |

Source: IMPLAN LLC, 2016, Type SAM multipliers



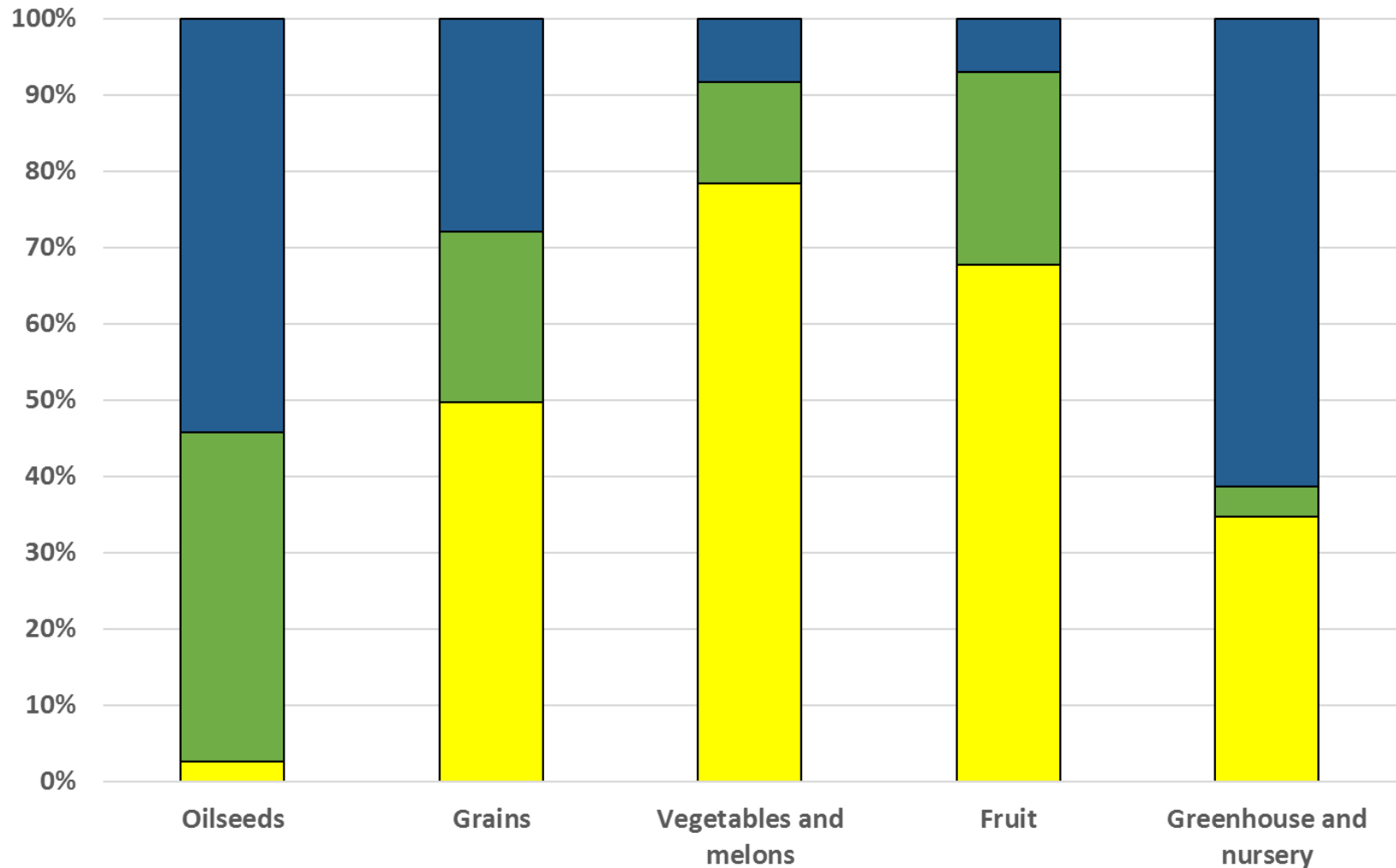


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# ***Forward Linkages: Farm and Food Manufacturing***



### Estimated destination of New York State Crop Supply, 2014

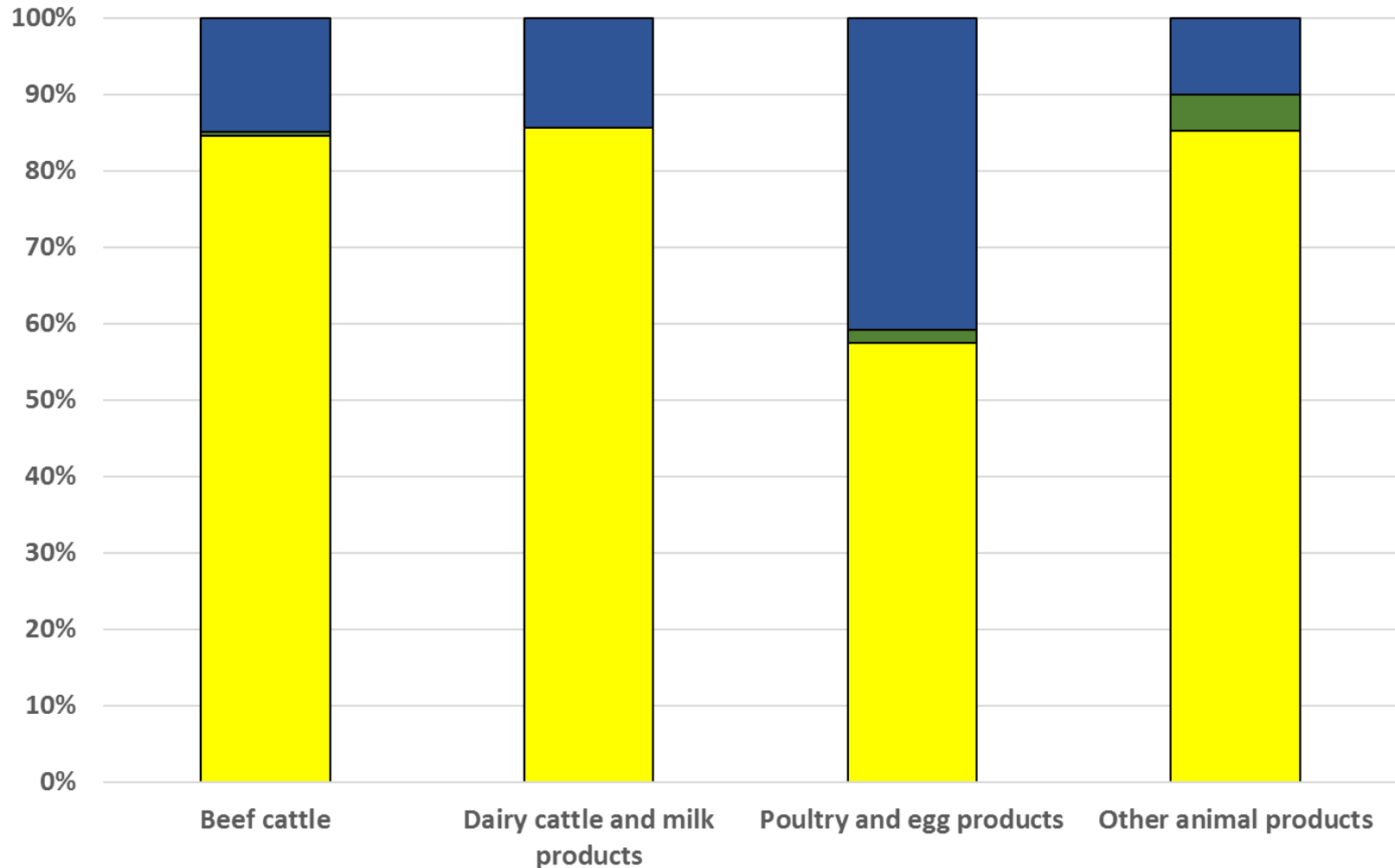


Source: Implan LLC, 2016

■ In-State ■ Foreign exports ■ Domestic exports



### Estimated destination of New York State Livestock Supply, 2014



Source: Implan LLC, 2016

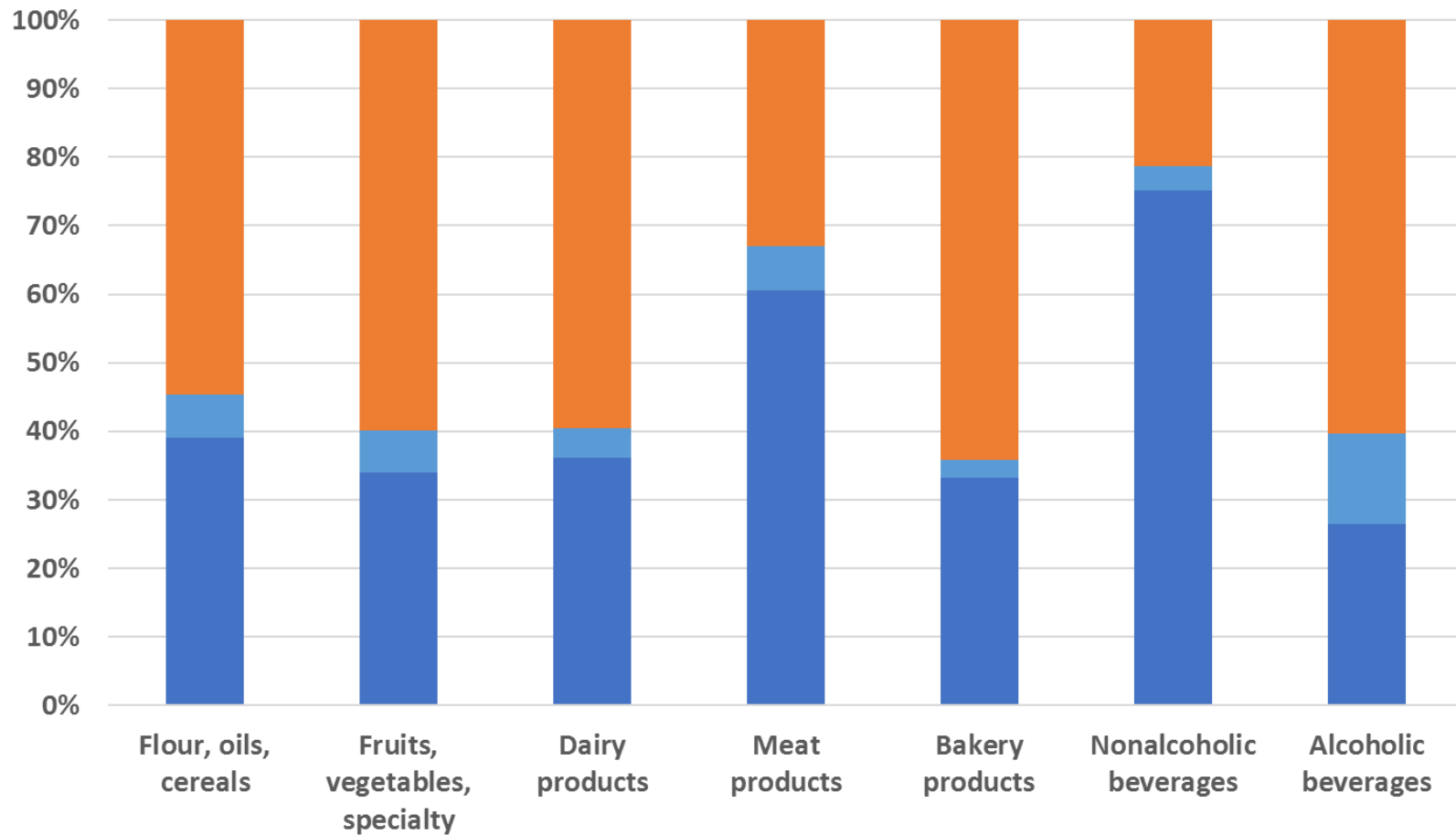
■ In-State

■ Foreign exports

■ Domestic exports



### Estimated destination of selected processed food and beverage products, New York State, 2014

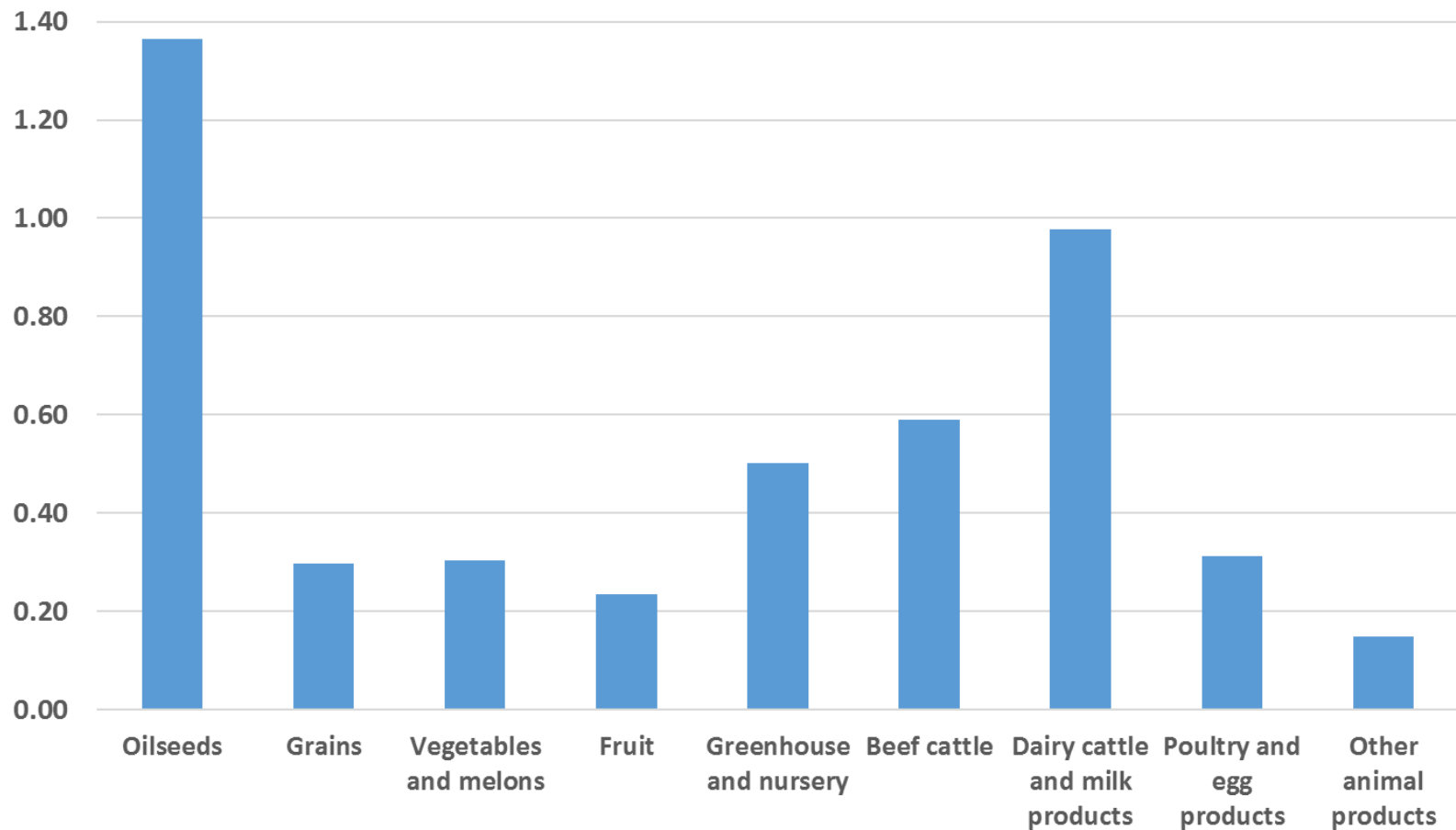


Source: Implan LLC, 2016

■ In-State   ■ Foreign exports   ■ Domestic exports



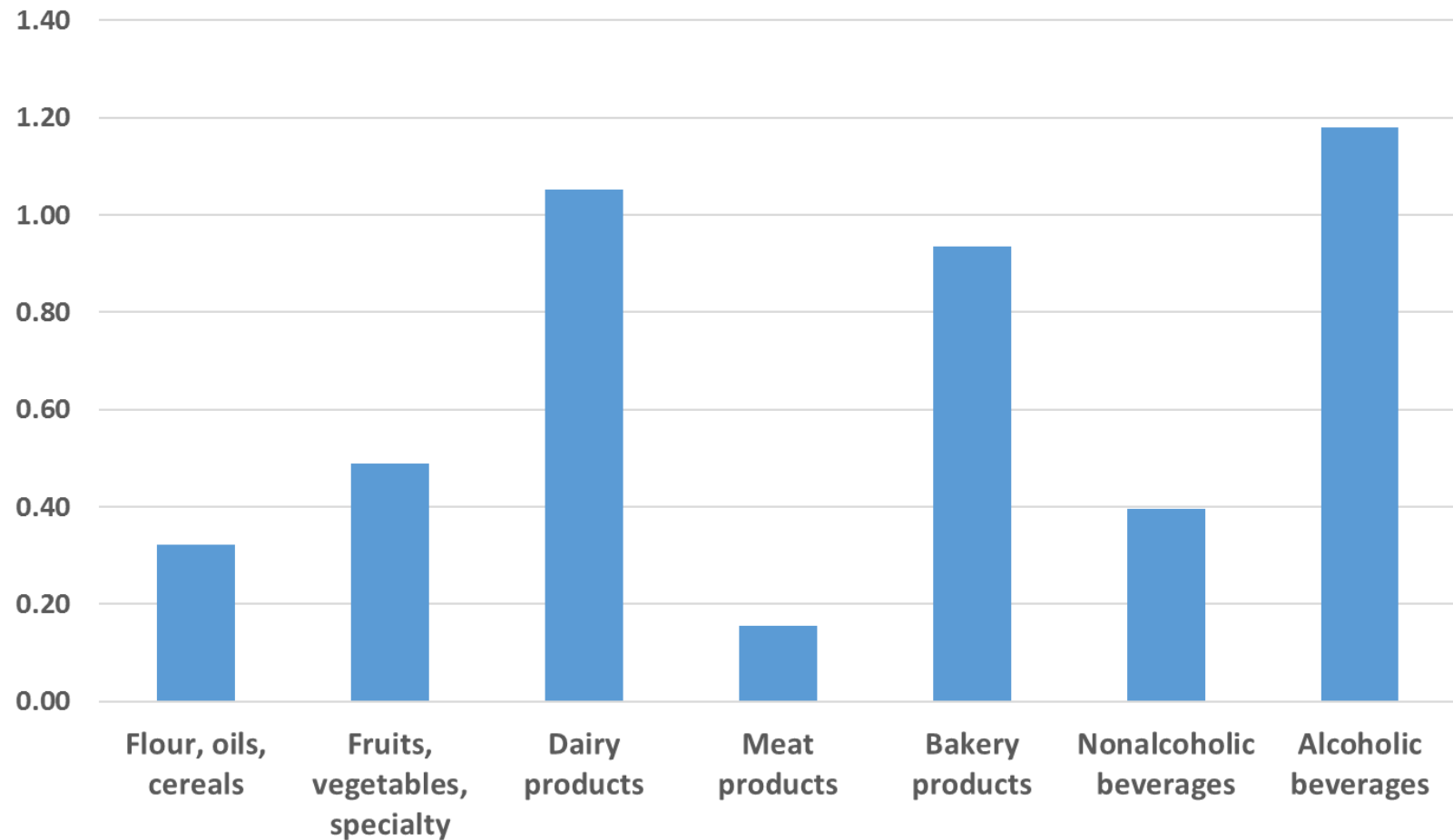
### Commodity Production to Demand Ratio (all users) of farm products, New York State, 2014



Source: Implan LLC, 2016



### Commodity Production to Demand Ratio (all users) of processed food and beverage products, New York State, 2014



Source: Implan LLC, 2016



## ***Conclusions***

- Food & beverage manufacturing has been a leading manufacturing industry in NYS
  - Economic multipliers are relatively strong, particularly for industries with strong backward linkages to primary farm production sectors.
  - Comparing product trade flows and supply-to-demand ratios within the state is useful in identifying sectors for export enhancement (supply) and import substitution (demand).
  - The real question is how to sustain growth moving forward
    - In-state source utilization/supply
    - Improve business-to-business linkages, upstate-downstate
    - Alignment of strategy with producers and processors
    - Adaptability of products for changing consumer & retailer preferences



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# Thank You!

## For more information:

***The Economic Contribution of Agriculture in NYS (2014)***

<http://publications.dyson.cornell.edu/outreach/extensionpdf/2016/Cornell-Dyson-eb1609.pdf>

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