Conducting Economic Impact Assessments

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Overview

• What Are Economic Impacts?
• The IMPLAN Model
• Examples of Recent Applications:
  – *E coli* Impacts on Texas Spinach
  – Economic Impacts of Citrus Greening
• Economic Impacts of Selected *E coli* Reducing Technologies on the U.S. Beef Industry
• Summary
Economic Impacts
Input/Output Model Definitions

• **Output**: Increase in Business Sales Required to Support $1 of Demand

• **Value Added**: Additional Gross State Product due to $1 Increase in Demand

• **Employment**: Additional Employees Required for $1 Million Increase in Demand
Using IMPLAN to Estimate Economic Impacts

• IMPLAN Utilizes Economic Multipliers for 438 Sectors of the Economy to Estimate How a Change in One Sector Impacts Output, Value Added, and Employment in All Sectors of the Economy

• Using 2012 Data, Construct a Model for the U.S. and/or Selected Regions

• Results of Analysis:
  ➢ Direct Impacts Relate to Sector in which the Original Change Occurs, Beef, or Example
  ➢ Indirect (Input Purchases) & Induced (HH Income Driven) Impacts Relate to Supporting Industries
Impacts of *E coli* Outbreak on Texas Spinach

- Texas Spinach Industry Valued at $30.4 Million
  - $9.5 Million in Fresh Market Sales
  - $20.9 Million in Processing Market Sales
- Texas Spinach Industry Supported an Additional $24.6 Million in Purchases of Inputs and Services, Generated $29.1 Million in Value Added, and Employed 481 People
- In September 2006, *E coli* Outbreak in Fresh Spinach Originating in CA Affected Consumers in 26 States
- Though the Outbreak Did Not Originate in Texas, Texas Industry Expected a 20% Decrease in Demand
## Economic Impacts of 2006 *E Coli* Outbreak in Spinach on Texas

<table>
<thead>
<tr>
<th>in Demand for Texas Spinach</th>
<th>Output</th>
<th>Value Added</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Million Dollars)</td>
<td>(Jobs)</td>
<td></td>
</tr>
<tr>
<td>Direct (Fresh and Processed Spinach)</td>
<td>-$6.23</td>
<td>-$3.14</td>
<td>-57</td>
</tr>
<tr>
<td>Indirect &amp; Induced (Wholesale Trade, Real Estate, Transportation, Ag Svc, Food Svc., Etc.)</td>
<td>-$4.76</td>
<td>-$2.67</td>
<td>-39</td>
</tr>
<tr>
<td>Total</td>
<td>-$10.99</td>
<td>-$5.81</td>
<td>-96</td>
</tr>
</tbody>
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Source: Center for North American Studies, using IMPLAN Input/Output Model
Economic Impacts of Citrus Greening

• Texas Citrus Industry Valued at $79.3 Million
  — Production Concentrated in the Lower Rio Grande Valley

• Citrus Industry Supports an Additional $42.1 Million in Purchases of Inputs and Services, Generates $75.4 Million in Value Added, and Supports 1,911 Jobs
  — Transportation, Ag Services, Wholesale Trade, Food Services, and Real Estate among Leading Supporting Sectors

• Citrus Greening (*Huanglongbing*), First Documented in 1700’s and Spread by Asian & African Psyllid, Discovered in Florida in 2005

• Greening Renders Trees and Their Fruit Useless

• Asian Psyllid Widespread in Texas but No Greening, 2007

• Estimated 20% Market Loss by Year 2; 60% by Year 5
## Economic Impacts of Citrus Greening in Texas, 2007

<table>
<thead>
<tr>
<th></th>
<th>20% Reduction in Market Value (2 Years After Infestation)</th>
<th>60% Reduction in Market Value (5 Years After Infestation)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Output ($ Million)</td>
<td>Jobs</td>
</tr>
<tr>
<td>Direct</td>
<td>-$15.5</td>
<td>-237</td>
</tr>
<tr>
<td>Indirect &amp; Induced</td>
<td>-$8.2</td>
<td>-136</td>
</tr>
<tr>
<td>Total</td>
<td>-$23.7</td>
<td>-373</td>
</tr>
</tbody>
</table>

Source: Center for North American Studies, using IMPLAN Input/Output Model
Greening Discovered, Jan 2012 (5 Years After Study Conducted)

• First Quarantines in Texas Announced Jan 2012 – Feb 2014 Were 5-Mile Radii around Specific Locations
  – San Juan, Mission and La Blanca
  – These 3 Areas Combined into 1 Large Area in Late Feb 2014

• In March 2014, Another 5-Mile Quarantine Radius around Harlingen Announced

• In April 2014, Quarantined Area Expanded to Include of Hidalgo and Cameron Counties, 2 of the 4 Citrus Producing Counties in Texas

• Impacts Could be Devastating
Economic Impacts of Selected *E coli* Reducing Technologies on US Beef Industry

- Can’t Link an \((x)\)log Reduction in *E coli* Due to a Particular Technology to a Reduction in Positive Results for *E coli* in Beef
- Literature Indicates a Very Small, if Any, Impact on the Market
  - Scenario Analysis will be Used: 1%; 2.5%; and 5% Reductions in Demand
Evolution of the Analyses of Beef Processing Technologies:
  - More comprehensive of cost categories
  - However, no benefit information attributable solely to food safety was identified – Why?

Input from Industry:
  - Feedback from Advisory Board members indicated that traditional cost/benefit analysis is not viable for *E coli* reducing technologies
  - Nearly impossible to link an (x)log reduction in presence of *E coli* to a decrease in sample tests coming back as positive

Result - Industry Indicated the Following Guidelines:
  - New technology should not exceed 15-20 seconds/carcass and cost no more than $0.25/carcass
  - Proven technologies meeting these guidelines most likely adopted as each positive test costs $0.40/lb.

Going Forward, Focus on Economy-wide Benefits of Reduced Instances of *E. Coli*
Economic Impacts of Selected *E coli* Reducing Technologies on US Beef Industry

- *E coli* 0157:H7 Cases Cost the U.S. $478.4 Million/Year (Medical/Time Lost/Premature Death) at an Average Cost of $6,510 (74,340 cases/year)

- Beef (ground, intact, dishes) accounts for 64% of *E coli* 0157:H7 Costs

- Percentage of Cost by Category
  - Infection – 87.3% of Costs of *E coli* Cases
    - 5.9% Medical Care
    - 1.1% Lost Productivity
    - 80.3% Premature Death
  - End-stage Renal/Kidney Disease – 12.6% of Costs of *E coli* Cases
    - 1.5% Medical Care
    - 0.1% Lost Productivity
    - 11% Premature Death
Economic Impacts of Selected *E coli* Reducing Technologies on US Beef Industry

- **Economy-Wide Analysis Procedure**
  - Those Affected Impact the Economy in Different Ways
    - Hospital Visits, Complications, Death
  - Deduce Final Macroeconomic Impact, Accounting for Inter- and Intra-Sector Transfers

- **Scenario Analysis will be Used:** 1%; 2.5%; and 5% Reductions in Demand

- For Economy-Wide Analysis – Less *E coli* Resulting in Potential Income Gains from Fewer Premature Deaths and Higher Quality of Life
  - $276.5 Million Gain in Income
Thank You!

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