Michigan Agriculture Logistics and Supply Chain: Current State and Future Potential

Frederick A. Rodammer, Ph.D.
The Eli Broad College of Business
Michigan State University

February 12, 2014
Lansing Legislative Seminar – Presentation Outline

• The complexity of supply chains and the end to end supply chain

• State of Michigan Logistics and Supply Chain Strategy

• Current issues associated with Michigan Agriculture logistics and supply chain

• Michigan Agriculture supply chain assessment and strategy recommendations project
Example: Complexity In The Food Supply Chain

Transportation of products between stages in the system.

Food System Complexity
Food System Complexity
One Burger Contains:

- baking soda
- wheat gluten
- calcium propionate
- enzymes
- mono- and diglycerides
- diacetyl tartaric acid esters
- ethanol
- sorbitol
- polysorbate 20
- potassium propionate
- sodium stearoyl lactylate
- corn starch
- ammonium chloride
- ammonium sulfate
- calcium peroxide
- ascorbic acid
- azodicarbonamide

- Milk
- Water
- sodium citrate
- sodium phosphate
- artificial color
- acetic acid
- Enzymes
- Special Sauce
- Soybean oil
- distilled vinegar
- egg yolks
- sugar
- corn syrup
- spice extractives
- xanthan gum
- prop. glycol alginate
- potassium sorbate
- garlic powder
- caramel color
- Turmeric
- EDTA
- milkfat
- cream
- salt
- sorbic acid
- cheese culture
- soy lecithin
- starch
- pickles
- water
- HF corn syrup
- onion powder
- spice
- salt
- mustard flour
- sodium benzoate
- mustard bran
- hydrolyzed proteins
- paprika
- calcium disodium

- lettuce
- dehydrated onions
- Grill Seasoning
  - Salt
  - Pepper
  - cottonseed oil
  - soybean oil

- USDA inspected beef

- Cucumbers
  - water
  - Vinegar
  - Salt
  - calcium chloride
  - Alum
  - natural flavorings
  - polysorbate 80
  - turmeric

Prepared by Shaun Kennedy – Do Not Reproduce Without Permission
End-to-End Integrated Supply Chain Model

Relationship Management

Information, Product, Service, Financial and Knowledge Flows

SUPPLY NETWORK

INTEGRATED ENTERPRISE

Logistics

Procurement

Order Administration

Manufacturing

MARKET DISTRIBUTION NETWORK

Capacity, Information, Core Competencies, Capital and Human Resources
End-to-End Integrated Supply Chain Total Cost Analysis Approach

Cost Components
- Sourcing +
- Production +
- Handling +
- Inbound Transport +
- DC Handling +
- Inventory +
- Customer Transport +
- Duties and Taxes

Total Cost
State of MI Supply Chain and Logistics Strategy Focus

- Lower Cost
- Reduce Time
- Remove Risk
MI Supply Chain and Logistics Strategy Objectives

- Enable logistics and supply chain solutions to create more and better jobs.
- Collaborate with industry and regional partners to identify and prioritize initiatives to improve regional competitiveness.
- Develop strategic marketing programs and campaigns that promote Michigan’s supply chain capabilities and leverage its location and natural resources.
- Prioritize infrastructure and policy initiatives that will increase our competitive advantage, reduce cost, save time, and support value-added supply chain activity.
- Support the growth of Michigan’s industry with world-class supply chain infrastructure and talent.
Our Michigan TDL Advantage

- Location
- Infrastructure
- Industry
- Supply Chain Capability
Industry

- Automotive
- **Agriculture, livestock and food processing**
- Automotive
- Bio-energy
- Durable equipment and component parts
- Medical
- Office furniture
- Specialty chemicals
Michigan Agriculture Supply Chain Project

• **Purpose:** *Complete an overall end-to-end supply chain assessment of key commodity segments of Michigan agriculture, identify major infrastructure constraints, and provide recommendations and rationale for critical investments to improve Michigan’s economic competitiveness and job creation opportunities.*

• **Commodities:** Bean, Corn, Wheat, Soybean
Project Stakeholders

• Michigan Soybean Promotion Committee
• Corn Marketing Program of Michigan
• Michigan Wheat Program
• Michigan Bean Commission
• Michigan Farm Bureau
• MSU Department of Supply Chain Management
• MSU Product Center
• MDARD
• MEDC
• MDOT
Current Issues (Opportunities for Improvement)

- Fertilizer Price Increase
- Need for Michigan-based Food/Feed processing Sites
- Need for Michigan-based Animal Processing Sites
- Border Congestion
- Exports and Value Chain
Project Focus and Value

• **FOCUS:** End to end agriculture supply chain which begins with the purchase and application of fertilizers, continues with the harvest and the movement of products from the field to processing locations, continues with food/feed processing, and ends with the sale of processed product for animal livestock or the end consumer.

• **VALUE:** Reduced cost or cost avoidance for all stakeholders, improved service for the agricultural supply chain by reducing cycle times and delays for transport and processing, reduced supply chain risks for all stakeholders, and creation of new jobs for Michigan.
Project Scope: End to End Supply Chain

- Purchase & Application
- Harvest
- Transport & Movement
- Processing I – Food/Feed
- Processing II – Animal Processing
- Sale – Domestic and Export
End-to-End Integrated Supply Chain Model

Relationship Management

Information, Product, Service, Financial and Knowledge Flows

SUPPLY NETWORK

INTEGRATED ENTERPRISE

Logistics

Procurement

Order Administration

Manufacturing

MARKET DISTRIBUTION NETWORK

Capacity, Information, Core Competencies, Capital and Human Resources
## Project Phases and Completion Date

<table>
<thead>
<tr>
<th>Phase</th>
<th>Activity</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Project Charter, Work Plan, Resources</td>
<td>Completed</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Data Collection</td>
<td>In Progress</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Analysis &amp; Process Modeling</td>
<td></td>
</tr>
<tr>
<td>Phase 4</td>
<td>Develop SCM Recommendations</td>
<td></td>
</tr>
<tr>
<td>Phase 5</td>
<td>Validate Recommendation</td>
<td></td>
</tr>
<tr>
<td>Phase 6</td>
<td>Implementation Planning</td>
<td>Project Completion Date of 2Q, 2015</td>
</tr>
</tbody>
</table>

**LEVERAGE RESULTS:** Recommendations for will be shared and leveraged to other Michigan agriculture crops.
Michigan Agriculture Logistics and Supply Chain: Current State and Future Potential

Frederick A. Rodammer, Ph.D.
The Eli Broad College of Business
Michigan State University

February 12, 2014