Maximizing Freight Movements in Local Food Markets

An Exploration of Scale-Appropriate Solutions for Local Food Distribution

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Research: Phase I

Phase 1 Goal:
To understand how local food supply chains function to make them more efficient

Supply chain inefficiencies are obstacles to:
- Fair prices for farmers and consumers
- Support local economy & sustainable production practices

8 case studies of local food distribution operations
- Farm-direct
- Intermediated
- Mainstream
Businesses profiled

- Ecker’s Apple Farm
- Grass Run Farms
- Driftless Organics
- Keewaydin Organics
- Local Harvest Supply
- Bix Produce
- Edina Couriers
- Sodexo

Courtesy of Driftless Area Initiative
Challenges

- Difficulty of maintaining product identity throughout supply chain
- Costly physical infrastructure
- Need for scale-appropriate tracking technologies
- Need for improved delivery coordination
- Lack of knowledge about actual cost of distribution
- Inconsistencies across interstate transport regulations
- Unreliable local supply
Maintaining product identity throughout supply chain

- **Innovations:**
  - QR codes
  - Knowledgeable product representatives
Costly physical infrastructure

Innovations:

- Low-tech, low-cost storage
  - Seasonal use of freight containers

- Formal and informal hubbing and shared equipment

- Localization of large enterprises
  - Large distributors & food service operators launch subsidiaries to focus on local markets

Hawkeye Foodservice distribution range
Improving delivery coordination

Innovations:
- Formal & informal “food hubs”
- Localization of larger food distributors
- Supply chain partnerships
- Outsourcing to independent haulers
Lack of knowledge about actual cost of distribution

Innovations:

- Cost of distribution workshops
  - Land Stewardship Project
    www.landstewardshipproject.org/cbfed/foodtransportation-costs.html

Edina Couriers
## Cost of distribution Worksheets

### Calculating Your Transportation Costs: Direct Delivery by Farmer-owned Vehicle

<table>
<thead>
<tr>
<th>B</th>
<th>General Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Commodity to be delivered</td>
</tr>
<tr>
<td>5</td>
<td>Commodity unit (case, pound, carton, etc.)</td>
</tr>
<tr>
<td>6</td>
<td>Selling price per unit</td>
</tr>
<tr>
<td>7</td>
<td>Delivery size, in units</td>
</tr>
<tr>
<td>8</td>
<td>Labor rate ($/hr)</td>
</tr>
<tr>
<td>9</td>
<td>Unloading time per delivery (minutes)</td>
</tr>
<tr>
<td>10</td>
<td>Number of deliveries per trip</td>
</tr>
<tr>
<td>11</td>
<td>Delivery route (miles, round trip)</td>
</tr>
<tr>
<td>12</td>
<td>Fuel cost (gas or diesel, $/gal)</td>
</tr>
</tbody>
</table>

### Vehicle Information

| 15| Farm truck fuel economy (mpg)                                                        |
| 16| Vehicle tire costs (set of tires)                                                    |
| 17| Vehicle tire life (thousand miles)                                                   |
| 18| Expected maint./repair expenses this year                                            |
| 19| Expected depreciation this year                                                      |
| 20| Expected miles driven this year                                                      |
| 21| Avg speed when making deliveries (mph)                                               |

### Operating Costs per Mile (don’t use IRS rate)

| 9 | Fuel costs \( B12/B15 = \)                                                          |
| 10| Maintenance/Repair \( B18/B20 = \)                                                   |
| 11| Tires \( B16/B17 = \)                                                                |
| 12| Depreciation \( B19/B20 = \)                                                         |
| 13| Labor \( (((B10 \times B9)/60) + B11/B21) \times B8/B11 = \)                        |

### Total Operating Costs per Mile

\[ E9+E10+E11+E12+E13 = \]

### Total Operating Costs per Trip

\[ E14 \times B11 = \]

### Distribution Cost per Unit of Produce

\[ E16/B7 = \]

### "Farm Gate" Margin per Unit

\[ B6-E18 = \]
Inconsistencies across interstate transport regulations

Innovations:

- Small, in-state operations can contract with larger haulers for interstate deliveries
- Policy makers can work to harmonize interstate regulations to increase regional trade
Unreliable local supply

Innovations:

• Aggregation

• Producer training & resources
  - Local Harvest Supply
    //localharvestsupply.com/pages/our-growers/resources-for-growers.php
  - Family Farmed’s “Wholesale Success”
    http://www.familyfarmed.org/wholesale-success/
Summary of Phase I

- Strategic use of intermediated supply chains shows promise for increasing efficiencies that could reduce local food distribution costs.

- Many distribution challenges & tools appear to be scale-specific:
  - Inventory management systems (IMS)
  - Retention of product identity
  - Route-planning

- The scale-specific nature of many of the innovations designed to improve efficiencies in transportation and logistics means that there’s no silver bullet
Phase II

Tools for moving into the wholesale marketplace
Task I

Assess the feasibility of integrating technology tools into distribution infrastructure of small to mid-sized growers.
Traceability Technology

- Tracking of produce from the field to final delivery through the use of software, handheld readers and tags
- Resulting data available to trusted supply chain partners through the Internet
- Makes quick detection and solution of food safety problems in the supply chain more likely
- Technology is becoming easy to implement
Traceability Technology

Traceability increases communication in a supply chain when information is freely shared between partners.

Traceability Technology

- Supply chain tags are usually in the form of **UPC** symbols or increasingly as Quick Response (**QR**) style barcodes, particularly when intended for use by consumers.
- Radio Frequency Identification (**RFID**) tags are also used in traceability, although few consumer applications are available at this point.

UPC

QR

RFID
Tracing Local Food: The Consumer

- Consumers learn about local products from websites by using mobile devices (e.g. iPhones) to scan tags on product packages and store shelving.

- Local Food Websites can distinguish themselves by offering a message of fair dealing, reliability and uniqueness.

The Limits of Local Knowledge

• Distribution is often about aggregation.

• Tags on aggregated foods are less likely to offer information about individual farms.

• Farms can be featured on a distributor website even if their produce is aggregated with other growers.

• The common values and practices of the farmers, and the quality of the region can still be expressed.
Virtual Food Hubs match producers and suppliers with consumers through the Internet.
Virtual Food Hubs

- Virtual hubs may combine their coordination services with traditional physical services.

- Physical hubs and virtual hubs employ many of the same technologies (e.g. web presence and inventory software).

- Can virtual hubs effectively help mid-scale farmers meet increased demand? How efficiently?
Task 2

Identify “cost of distribution” for growers operating in direct and intermediated supply chains
Cost of Distribution Tools

The Farm to School Distribution Cost Template is a cost of distribution tool available from the Oklahoma Farm to School website.

- Each form determines the cost of using a specific type of marketing for one type of product (e.g. direct marketing costs for Watermelon).
The Land Stewardship Project (LSP) in Minnesota has adapted this Excel based tool into forms for the use of farmers attending cost of distribution workshops.

LSP’s challenge has been to encourage more producers to try out this tool.

Many farmers are not interested in scaling up distribution, or not convinced that using this kind of tool would be worth their time.
Veggie Compass – Whole Farm Profit Management is a cost tracking tool being developed through the University of Wisconsin - Madison.

With slight modification, Veggie Compass could determine the cost of self-distribution for specific crops by amount sold and distribution method.
Cost of Distribution Tools

The Ag Decision Maker is a website of resources collaboratively developed at Iowa State University.

- The site has many documents and tools designed to aid farmers in determining costs and making decisions related to crop planning, marketing and other aspects of farming.

- One tool, Evaluating Marketing Outlets Using Whole-Farm Records, provides a way to outline costs associated with different marketing options.
Task 3

Use what we have learned about the cost of self-distribution to develop a Request for Proposal (RFP) Template to aid small farms interested in hiring transportation.
Resources

Final Report: Maximizing Freight Movements in Local Food Markets

Lands Stewardship Project – Cost of Distribution Resources
http://www.landstewardshipproject.org/cbfed/food-transportation-costs.html

USDA Resources for Supporting Food Hub Work
http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5091484

Veggie Compass – Farm Profitability Resources
http://veggiecompass.com/default.aspx

Wallace Center’s - Food Hub Center
http://ngfn.org/resources/food-hubs/food-hubs