

Evaluating the Economic Impacts of Local & Regional Food Systems



A TOOLKIT TO GUIDE
COMMUNITY DISCUSSIONS,
ASSESSMENTS AND CHOICES

**East Lansing, MI
December 14, 2015**



United States Department of Agriculture

U.S. DEPARTMENT OF AGRICULTURE



AGRICULTURAL MARKETING SERVICE

Introduction



- Welcome – Rich Pirog
- Thanks to our sponsor:

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With funding from:

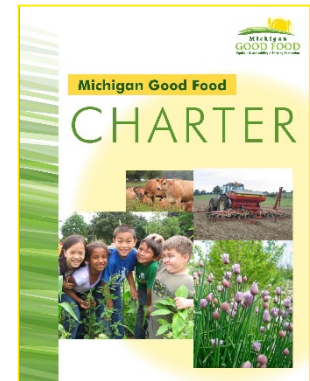


MSU Center for Regional Food Systems (CRFS)

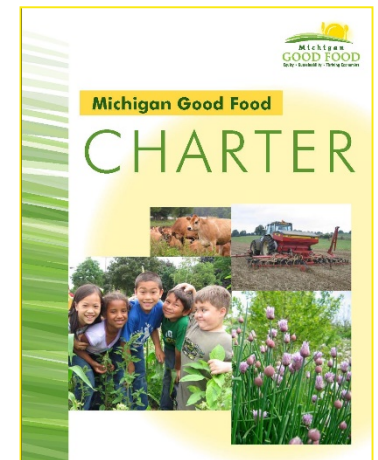
Mission: Develop regionally integrated, sustainable regional food systems

Work: Michigan Good Food Charter, food access and health, farm to institution and farm to school, healthy food financing, food hubs, food systems planning and food policy, organic production - marketing, beginning farmers, city-region food systems in a global context

Good Food = Affordable, Healthy, Fair, & Green for all Michiganders



Backstory: Why is the MSU Center for Regional Food Systems co-sponsoring this webinar with Dawn & Becca from Colorado State University?



COLLECTIVE IMPACT & SHARED MEASUREMENT

MICHIGAN GOOD FOOD CHARTER

- ◆ Collaborative project to build the case for collectively measuring statewide food systems change in Michigan

Good Food Charter Goals

- ① Institutions source 20% locally
- ② Farmers will supply 20% of food purchases, fair wages
- ③ Generate new agri-food businesses
- ④ 80% of Michigan residents will have access to healthy food
- ⑤ School nutrition standards
- ⑥ Food and agricultural education pre-K through 12th grade

Priority areas – Shared Measurement

Institutional Procurement



Economic Impact

- **Economic indicator training**
– Basic and advanced
(October – November 2015)
- Secondary data tools

Healthy Food Access

- New survey tools
- Secondary data template report
- Pilot projects - 2016

The Team – Dawn Thilmany, coordinator



- David Conner, University of Vermont
- Steve Deller, University of Wisconsin
- David Hughes, University of Tennessee
- Ken Meter, Megan Phillips Goldenberg, Crossroads Resource Center
- Alfonso Morales, University of Wisconsin
- Todd Schmit, Cornell University
- David Swenson, Iowa State University
- Allie Bauman, Rebecca Hill, and Becca Jablonski, Colorado State University

Justifying this Toolkit



- Broadly held sense that economic implications of new food system initiatives should be framed and measured in a more standardized (and rigorous) manner, but also responsive to community needs.
- USDA AMS:
 - New resources/initiatives (i.e., Farmers Market and Local Foods Promotion) in need of evaluation framework
 - Expanding role as technical service provider



Toolkit: Seven Modules

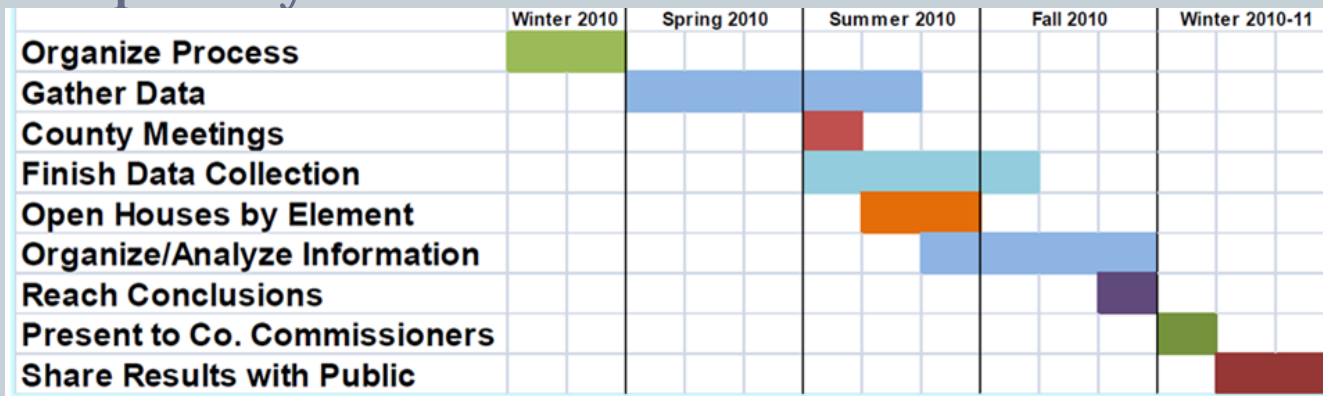


- Covers two stages of food system planning:
(1) **Assessment** (2) **Evaluation**
- **Modules (1-4)**: Guides the preliminary stages of an impact assessment - framing the system, relevant economic activities, and collecting and analyzing relevant primary and secondary data
- **Modules (5-7)**: Overview of more technical set of practices, including using information collected in stage one for a more rigorous analysis
- This toolkit is meant to be used in its whole or in part, but does not necessarily need to be utilized from start to finish
 - However, later modules assume knowledge of and findings from prior modules

Module 1: Structuring the Assessment Process to Enhance Success



- Food System initiatives are diverse
 - Place based nature is key to success in meeting local needs
- Toolkit urges it is important to:
 - Assemble a diverse project team
 - Establish realistic timeline and roles
 - Scope the study appropriately – establish study parameters and priority issues



Timeline for Northern CO Food Assessment

Modules 2 & 3: Primary & Secondary Data



- Provides list of secondary data sources (divided by supply chain)
 - Full and updated list available on website:
<http://www.localfoodeconomics.com/appendices/>
- Discussion of when and how to supplement with primary data collection.
- Detailed information about:
 - Qualitative and quantitative research;
 - Surveying, interviewing, and sampling methods.



Module 4: Data Interpretation



- **Let the data speak:**
 - Test your assumptions/conventional wisdom;
 - Comparative analysis/benchmarking;
 - Linkages across system (i.e., economic, social)
- **Words of caution:**
 - Correlation vs. causality;
 - Every *difference* in measurement does not represent a *significant difference*
- **Simple spatial analysis techniques explained:**
 - Cluster mapping;
 - Location quotients

Introduction to Economic Impact Assessment



ANALYZING LINKAGES OF LOCAL FOODS TO LOCAL ECONOMIES

MODULE 5





Direct Effect



Direct Effect



Indirect Effects

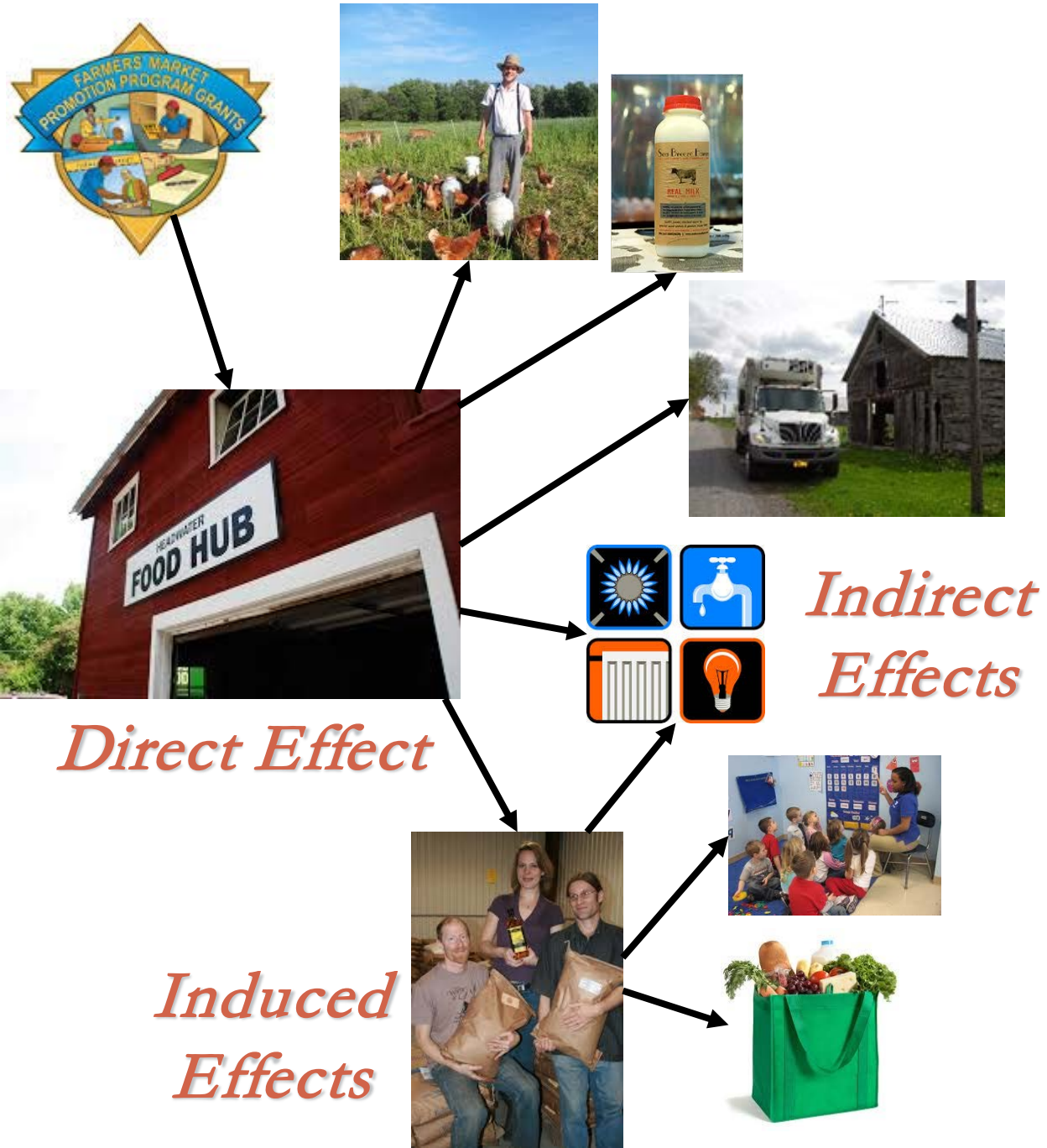
Direct Effect



Indirect Effects

Direct Effect



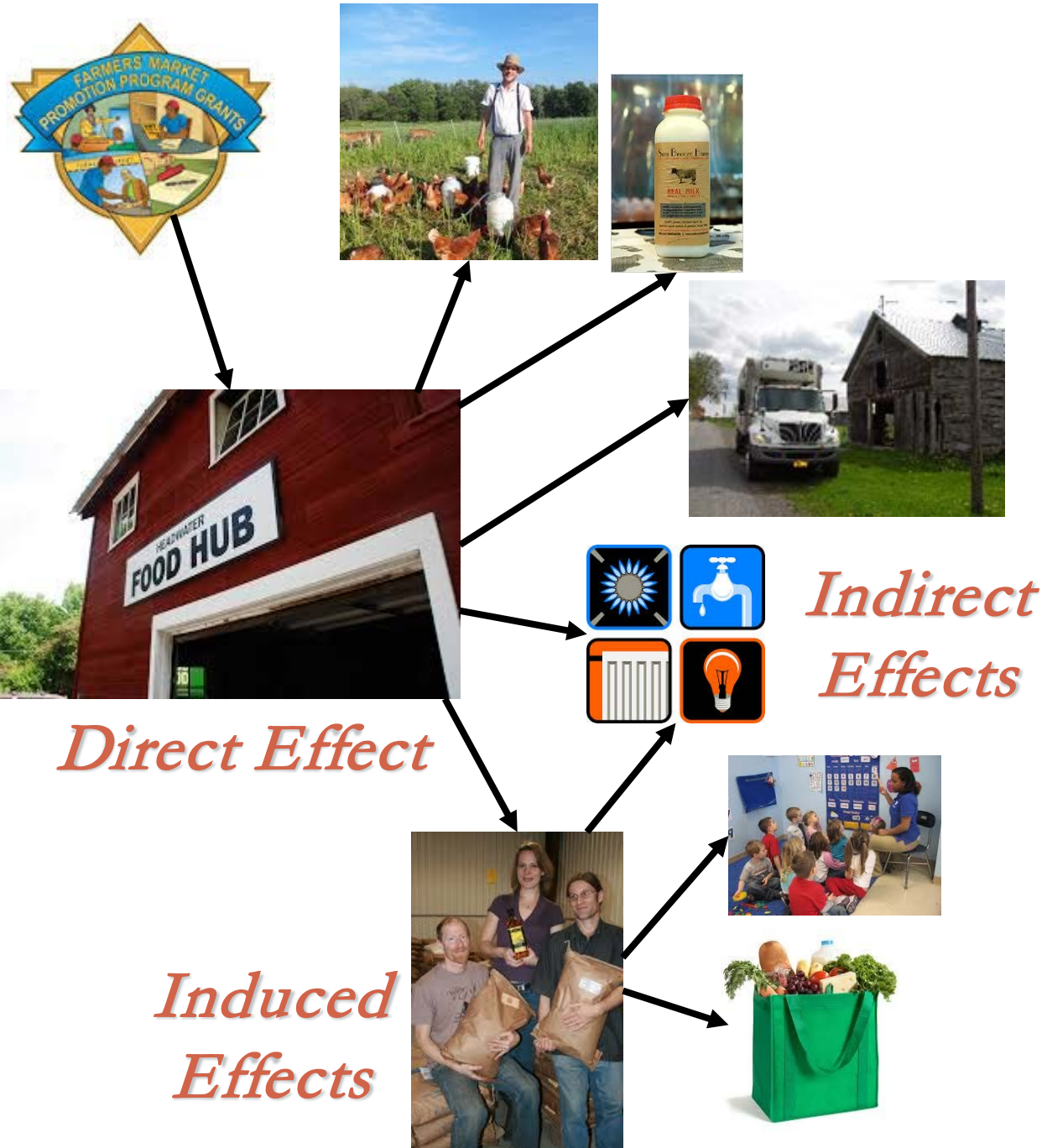


Indirect Effects

Direct Effect

Induced Effects





**Total Value of
Local Economic
Impact =
*direct + indirect
+ induced***



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Complex Linkages in Food Systems



- We are able to measure the extent of complex intra-regional linkages using **input-output analysis** to generate **economic multipliers**.
- An economic multiplier is a single number that captures the economy-wide circulation of activity from an initial financial transaction
 - direct + indirect+ induced effects

Clarifying Economic Terms



- **Growth** is a dynamic concept that looks at *change over a period of time*
 - Growth is synonymous with expansion; for example, more jobs, more people, more businesses, or more income.
- In contrast, **development** is related to *improvement relative to some starting condition*, or sustained progress toward a particular goal.
 - This could be movement toward a more sustainable use of resources, or enhancing the quality of life in the community
- Growth is relatively easy to measure; development is a more nebulous and multi-faceted concept.

Clarifying Economic Terms



- **Impact** tends to be associated with a specific event or change in behavior and can be static or dynamic.
- Consequently, **impact assessment** is comparing and contrasting what a community looks like before and after a particular event or change in behavior.
 - Often referred to as a **shock**

Economic Impacts of Local Foods



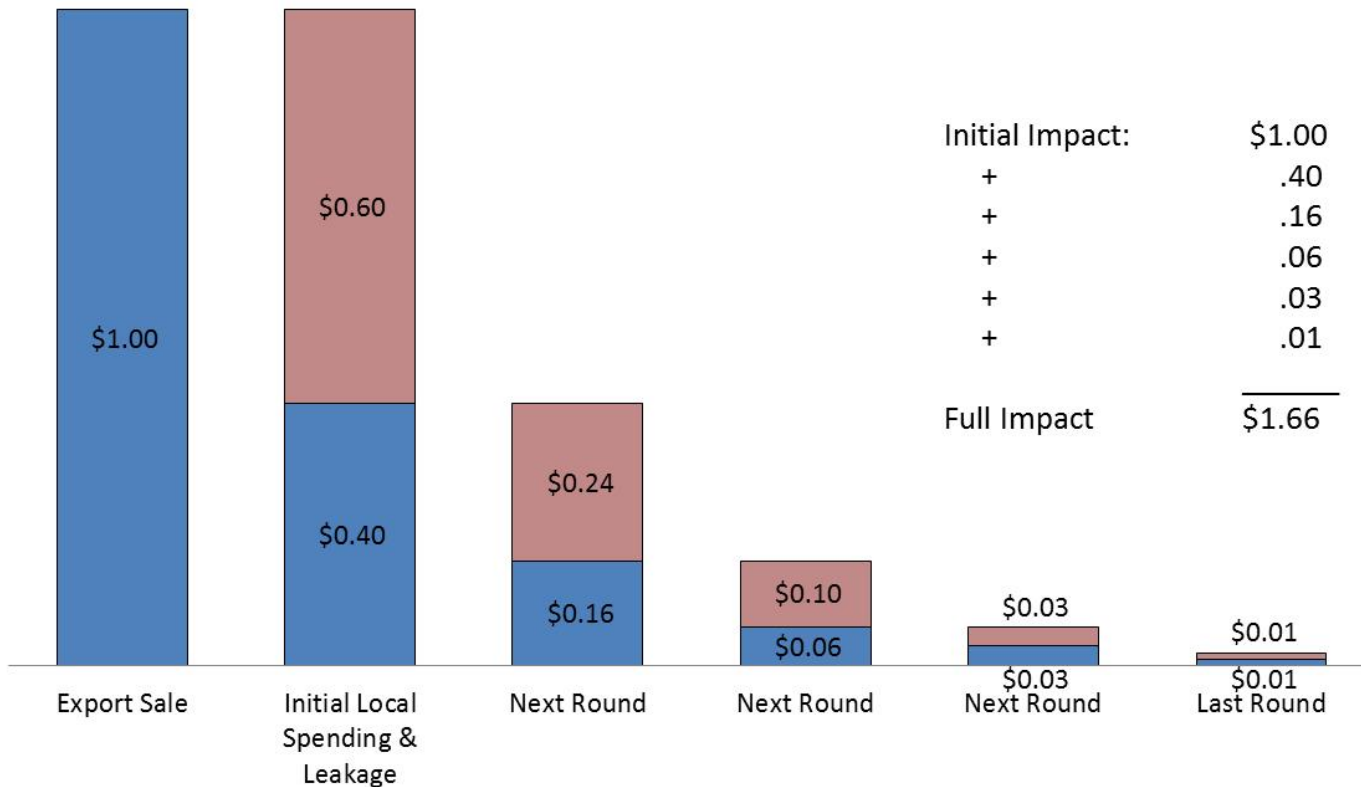
- One way to frame the impact of local food growth is considering it **import substitution**.
- When locally produced foods are substituted for imported items, stronger regional linkages are forged
 - If local foods production and consumption increase, there are economy-wide consequences.
 - Best practice measurement of these can help inform communities of the potential economic gains from local food system initiatives.

A Visual Representation



A Simple Multiplier Illustration

■ Local Spending ■ Leakage



Multipliers



- The value of the **multiplier** in this example is 1.66
 - Direct + the indirect + the induced effects
 - For every dollar of new local food sales revenue earned by the farmer, the total impact on the local economy is estimated to be \$1.66
 - ✦ i.e., the initial \$1 expenditure and an additional 66 cents based on the calculated economic multiplier effect
- The multiplier is **NOT** directly related to growth or development. It is aimed at assessing impact; the economy before and after the ‘shock’

Reliable Local Foods Impact Estimates



- **Input-output (I-O) models track the flow of transactions between local industries, sales by industries to households, and to other “final users” of goods or services (e.g., government)**
- **Most analysts use IMPLAN (IMpact Analysis for PLANning) for their I-O analysis because of its ease of operation**

Defining the Study Area



- **Determining what constitutes local can have a decisive impact on the results**
 - The broader the definition of local, the more inter-industry linkages exist
 - Less likely to emerge as a zero-sum game
- **To isolate the effects of an impact, create as small a study area as possible while including the areas necessary to capture all of the important effects**

Defining the Study Area



- Consider the availability of secondary data for your region, as described in Module 1 of the Toolkit
 - Secondary data available from IMPLAN by zip code, congressional district, county and state
 - IMPLAN's functionality allows researchers to easily develop multiple county or state-based models
- Regional scientists advise using the concept of a **functional economic area**
 - Semi self-sufficient economic unit including the places where people live, work, and shop, and can sometimes be identified by physical or other characteristics

Bigger Study Area is not always Better



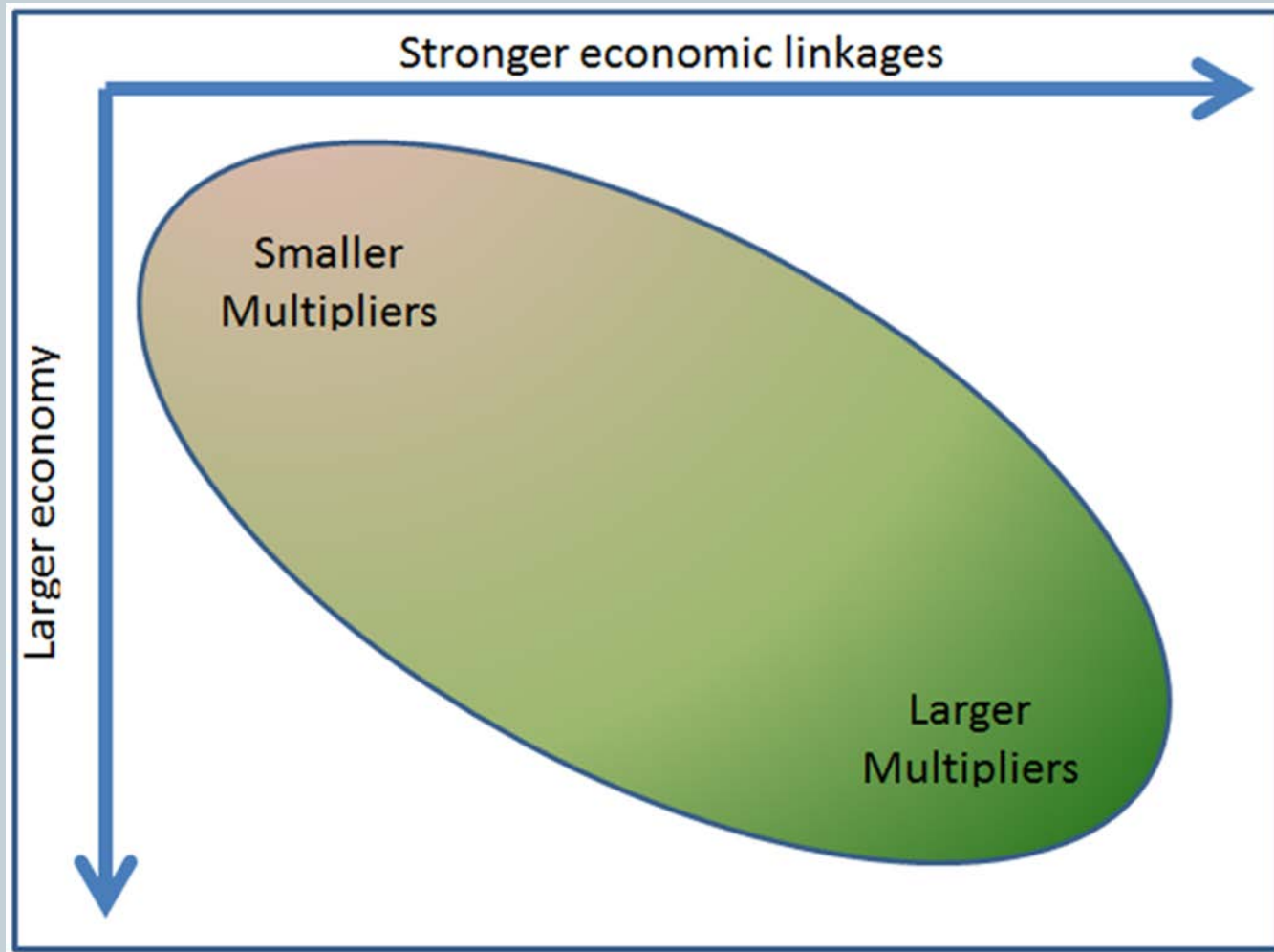
- **It is tempting to assume a statewide impact**
 - Unless the key aim of the study is to evaluate a state's contribution or statewide industry magnitude
 - However, using a larger geographic region will inflate and exaggerate your impact results
 - Results will be less reflective of the actual economic activity occurring in your region
- **A good rule of thumb is that a study territory should encompass the geography from which the majority of the assessment team members hail**
 - Don't forget to consider the residential location of the labor force as their spending patterns are important

Reasonable Size of Multipliers



- May be tempting to use the largest multiplier possible to build support for your position
- Researchers typically use multipliers less than 2.0
 - Multipliers for smaller rural areas close to 1.3 and for larger more urban areas closer to 1.9
- Two things that generally drive the size of the multiplier:
 1. The level of inter-industry linkages (imports or leakages)
 2. The size of the economy or sector being examined

Reasonable Size of Multipliers



Challenges with I-O and IMPLAN



- **Assumptions:**
 - Constant of fixed relationship among industries
 - ✦ If local foods production in a region doubles, so too will its demand for regionally supplied inputs
 - ✦ “Supply always equals demand”
 - Fixed technology
 - Fixed prices
 - No demand constraint-is there reason to believe there are new spending dollars in total?

A 'good' study



WHAT TO LOOK FOR WHEN REVIEWING LOCAL AND REGIONAL FOOD SYSTEM ECONOMIC IMPACT ASSESSMENTS

MODULES 6 AND 7

What does a 'good' study look like?



1. Good data

- Model reflects the conditions in the field
- Built from data that is likely used for comparables

2. Sound assumptions

Good Data



- **Adapting your I-O Model:**
 - Evidence that farmers and value-added businesses interact differently with the local economy than more commodity-oriented businesses
 - Evidence that these value-added businesses purchase a greater share of their inputs locally (by definition)
 - ✦ e.g., Food hubs, local food aggregation and distribution businesses

Model Reflects Reality



- Local food system producers have different expenditure patterns

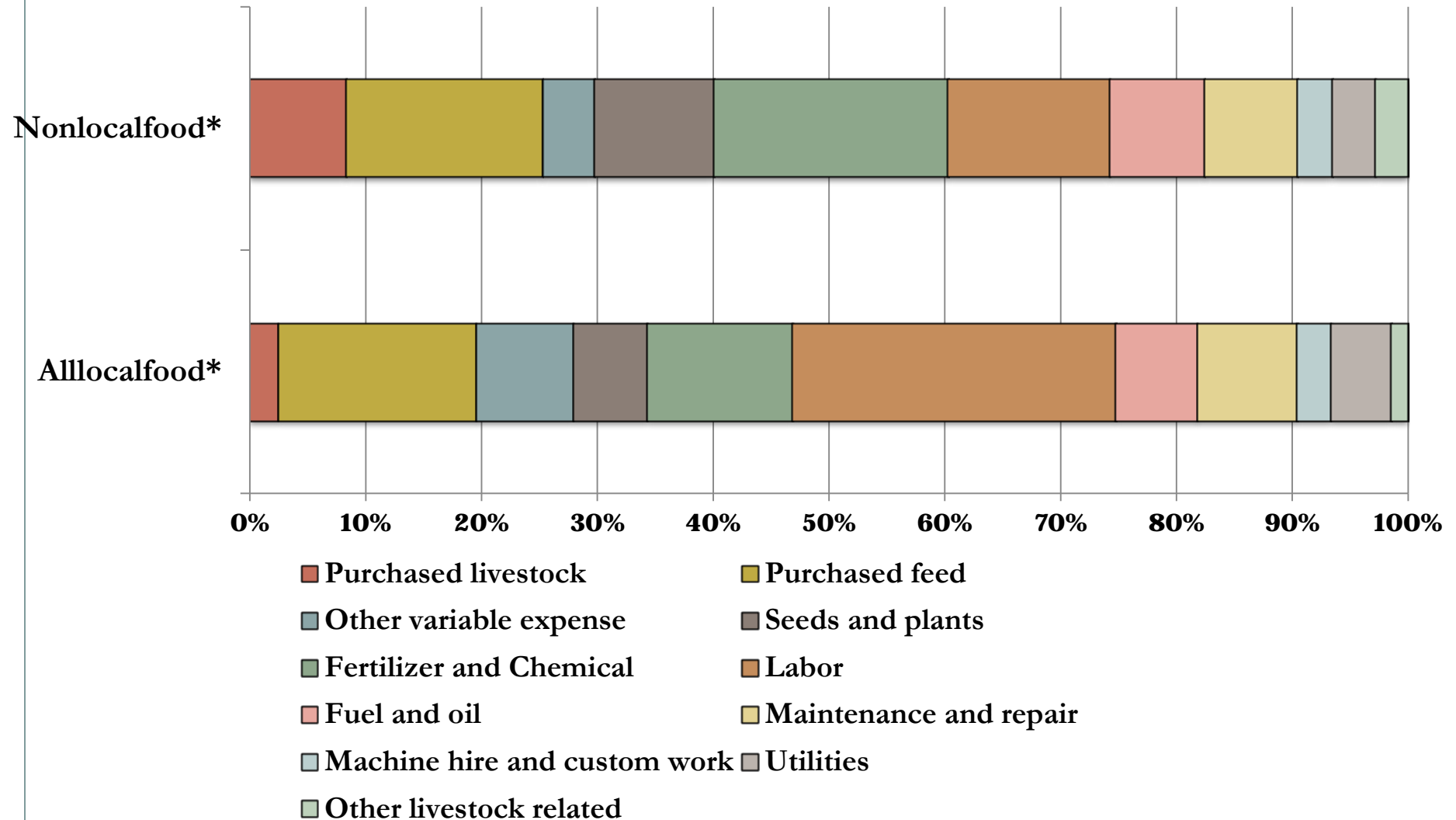


Source: California Tomato Machinery



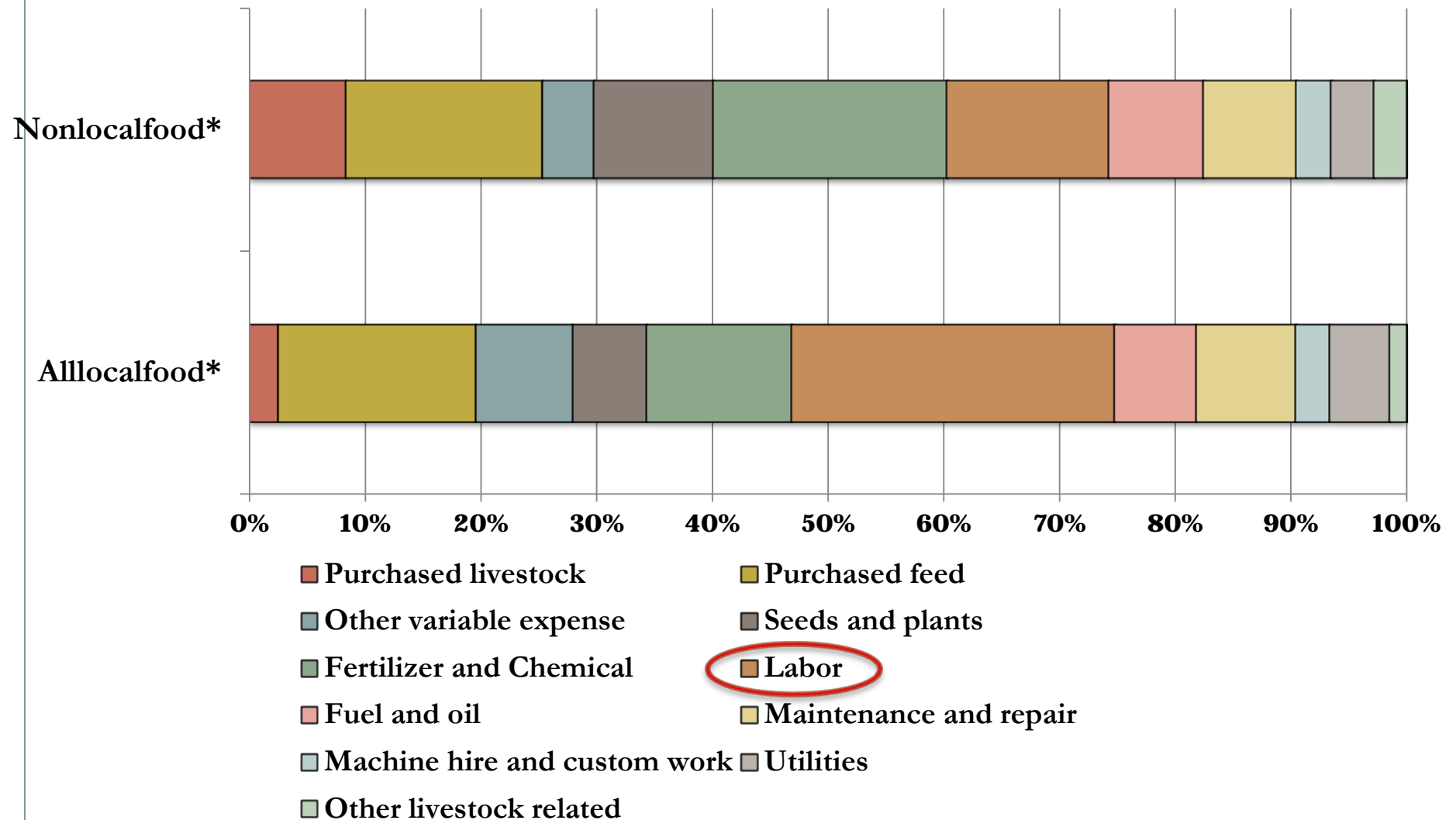
Red Fire Farm, Cherry Tomato Harvest.
Source: Emily Shannon, Formaggio
Kitchen Cambridge

US Benchmarks



Source: USDA ARMS 2013

US Benchmarks



Source: USDA ARMS 2013

IMPLAN Baseline Info



- IMPLAN data comes primarily from national sources – e.g., BEA, Ag Census
- Each IMPLAN industrial sector represented by a single, initially-fixed expenditure pattern.
 - 14 agricultural sectors, ex: fruit farming

Good Data



- **Normally need to augment available data by collecting information from the food system businesses**
 - Goal of primary data collection is to come up with an average local food farm/business expenditure profile --not an easy task
- **Important to ensure that such surveys are as representative of the targeted local producer or processor population as possible**
 - Surveys of convenience, like a select sub-set of program participants or advocates, likely will not be adequate
 - Document operational costs carefully or risk of economic distortions when data are run through input-output models

With data collection, don't just need to know *what* the producer/business purchases, but also *where!*

Summary of Expenditures Per Dollar of Output for the Default Agricultural (Farm Products) Sector and the Food Hub Farm Sector

Selected Industry Sector/Value Added Components	Farm Products (Default)	Food Hub Farm
Agriculture production ^a	\$0.056	\$0.159
Support activities for ag and forestry	\$0.018	\$0.079
Utilities	\$0.015	\$0.018
Construction	\$0.005	\$0.023
Manufactured food	\$0.002	\$0.010
Manufacturing (other)	\$0.022	\$0.027
Wholesale trade	\$0.015	\$0.016
Retail trade (total)	\$0.001	\$0.016
Transportation and warehousing	\$0.012	\$0.033
Finance and insurance	\$0.035	\$0.022
Real estate and rental (total)	\$0.055	\$0.014
Professional scientific and technical services	\$0.006	\$0.009
Automotive and machinery repair and maintenance	\$0.001	\$0.009
Other sector purchases	\$0.009	\$0.006
Total intermediate input purchases	\$0.250	\$0.441
Employee compensation	\$0.117	\$0.236
Proprietor income	\$0.159	\$0.053
Other property type income ^b	\$0.124	\$0.019
Tax on production and imports ^b	-\$0.007	\$0.056
Total payments to value added	\$0.393	\$0.364
Intermediate imports	\$0.356	\$0.195

Source: Schmit, Jablonski and Kay 2015

Sound Assumptions



- Finite resources (e.g., land, consumers dollars, public dollars) so every decision involves a choice
- Incorporated into economic impact assessments by estimating the **net** rather than the **gross** impact of changes in a local/regional food system
- Can be on supply (production) or demand (consumer) side, or both

Examining Net vs. Gross Impacts



- *The no resource constraints* assumption on the supply side –
 - i.e., gross gains in local food production must be balanced against the shifts (referred to as **countervailing effects**)
 - Usually come in the form of a direct, acre-by-acre reallocation of existing uses of agricultural land
- *The no opportunity cost of spending* assumption on the demand side –
 - i.e., farmers directly marketing their crops constitute a positive local economic impact, but there may be negative impacts
 - due to opportunity cost of lost direct sales activity in other sectors of the economy (the wholesale and retail sectors)

Expected Acres

Incorporating
Countervailing
Effects:
Potential and
Constraints to
Local Foods
Development
in the Midwest

• Major Metropolitan Markets

Expected Acres

- 5 to 249
- 250 to 999
- 1,000 to 2,499
- 2,500 to 6,100

0 60 120 240 Miles

Source: Swenson 2011

Opportunity Costs to Other Sectors



- **Requires information about the extent to which increased consumer purchases of locally-grown food:**
 - Affects other types of food purchases
 - Changes market prices and/or supply chain characteristics, or
 - Impacts land use
- **For instance, if a region's food buying dollars are shifted as a result of a "Buy Local" promotional campaign, or investments in a local food initiative can be expected to displace some food distribution**
 - No secondary data to answer that question
 - No data on exactly how linkages vary across different markets

Case Study: Food Hubs

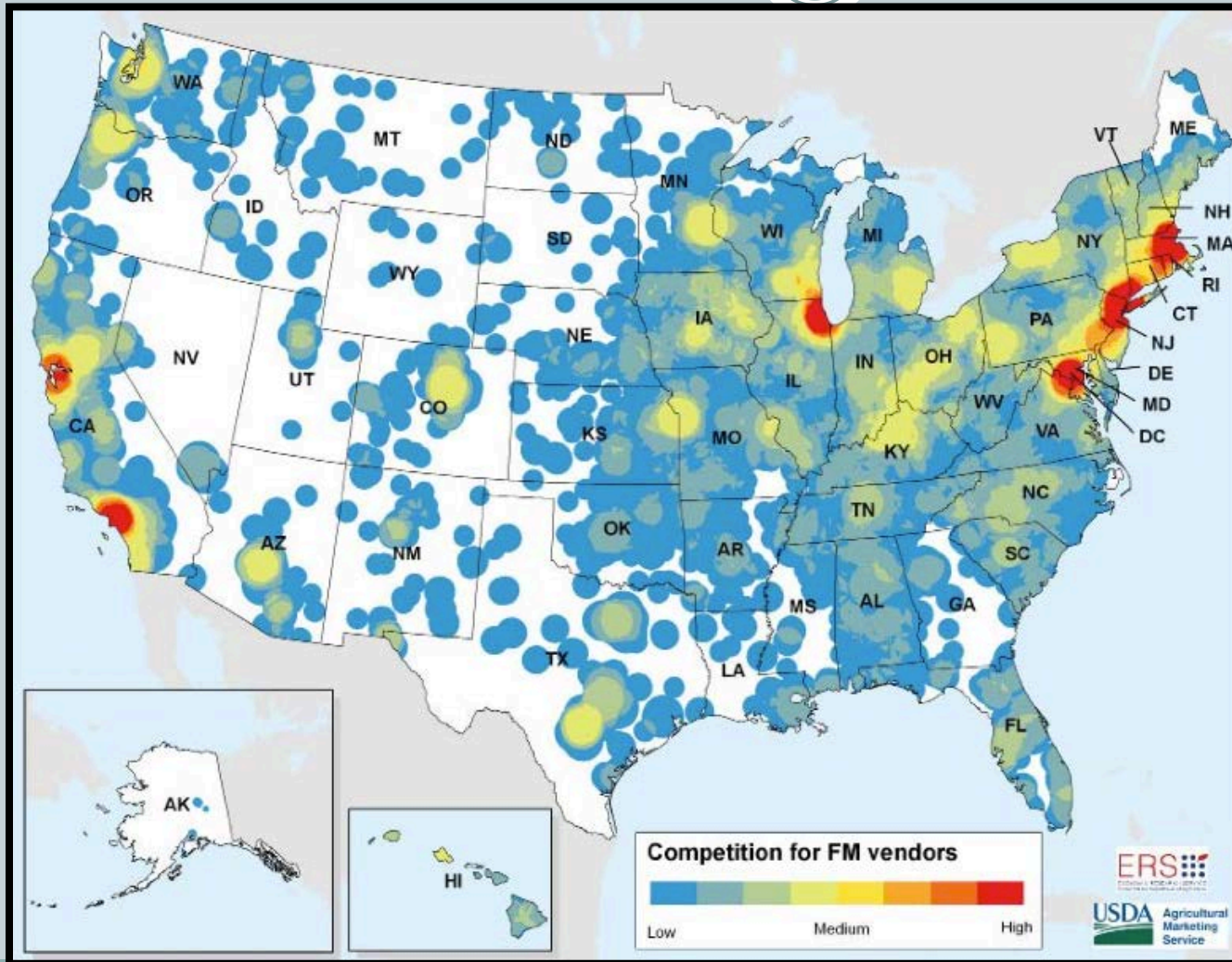
- **Surveyed 305 of Regional Access' customers**
 - 49% purchased less from other sources due to purchases from RA
 - Average reduction >23%
- **Opportunity Cost associated with \$1 increase in final demand for food hub sector ~ \$0.11**
- **Reduced Total Output Multiplier from 1.82 to 1.63 (>10%)**



Regional Access'
25,000 sq ft warehouse,
Trumansburg, NY

Sound Assumptions

Competition for Vendors at Farmers Markets



Does creating new markets in areas with high vendor competition increase market access for vendors?

Source: Lohr and Diamond 2011

Concerns about Overestimation



- Since economic impact numbers will be smaller when opportunity costs are considered or included, it can be challenging from a political standpoint
 - Larger numbers may help to ‘sell’ projects, but results are less defensible.
 - It is a valuable practice to:
 - ✦ Adopt more standardized approaches
 - ✦ Offer good examples of how opportunity cost adjustments can be incorporated, and
 - ✦ Learn from previous rigorous examples to support your modeling refinements

Become Involved

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A Toolkit to Help Your Community Understand the Economic Impacts of Your Local Food System Initiatives

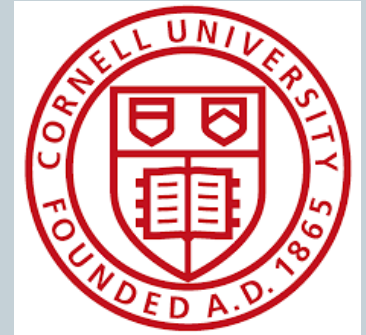
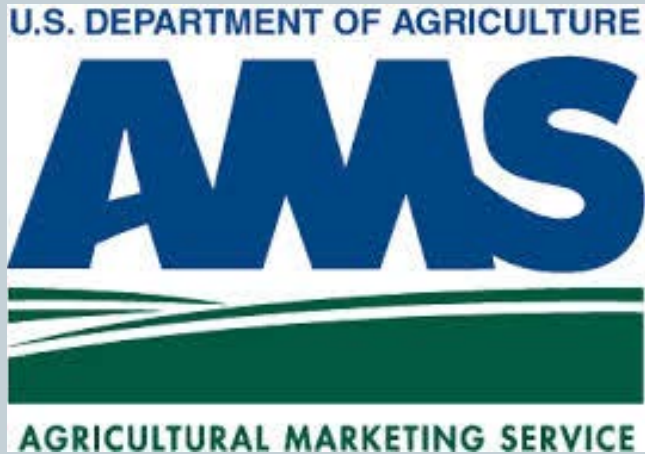
Who We Are

In 2014, the U.S. Department of Agriculture Agricultural Marketing Service convened a team of regional economists and food system specialists to develop a best practice Toolkit for evaluating the economic impacts of local food system activities. The team, coordinated by Dr. Dawn Thilmany McFadden at Colorado State University, hopes that this Toolkit can guide and enhance the capacity of local organizations to make more deliberate and credible measurements of local and small-scale economic activity and other ancillary benefits.

The Toolkit is made up of seven *modules* that can be grouped into two stages of food system planning, assessment and evaluation. The first set of modules (1-4) guides the first stages of an economic impact assessment and includes framing the system, relevant economic activities and assessment process as well as collecting and analyzing relevant primary and secondary data. The second set of modules (5-7) provides a more technical set of practices and discussion of how to use the information collected in stage one to conduct a more rigorous economic impact analysis.

Website and listserv: **localfoodeconomics.com**

Thank you!



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