O'NEILL
SCHOOL OF PUBLIC AND
ENVIRONMENTAL AFFAIRS

Shellye Suttles, Wesley Zebrowski

An economic analysis of Indiana's recent food manufacturing growth

SECTION 1

Background: Food Manufacturing Trends and Context

Indiana Food Manufacturing (prior 2000s)

- **Indiana's food manufacturing highly influenced by local agricultural supply**
- Hog supply → meat processing
- Decline in wheat, oat and tobacco led to decline in flour and cigar industries

Indiana Food Manufacturing (prior 2000s)

- Decreased local demand hurt producers of cookies, crackers, and distilled liquors
- National/International demand led Indiana to also expand bread baking, soft drink bottling, frozen specialty foods, and other prepared foods
- High labor costs and low productivity lead to vegetable canning declines

National Food Manufacturing Trends

1. Conventional influences: infrastructure, agglomeration, urbanity, input markets, and product markets (Henderson & McNamara, 1997; Lambert & McNamara, 2009; Low et al., 2020)

2. Policy influences: state and local taxes, health department regulations, and environmental laws (Capps et al., 1988; Goetz, 1997)

3. Social influences: ethnic diversity may have a positive impact (Davis & Schluter, 2005)

Recent Food Trends

1. Increased focus on health and wellness
2. Push towards sustainability in the food system, leveraging labeling and “authenticity” (Fusaro, 2009; Toops, 2012)
3. Food manufacturers and retailers have targeted different flavors, food, and messages to different ages, ethnicities, and incomes (Sloan, 2011)

Research Question:

How do recent food trends and Indiana-specific factors impact localized determinants of food manufacturing growth in Indiana?

SECTION 2

Analysis

Multivariate Regression, HC5

1. **Dependent:** 2009-2017 change in Food Manufacturing firms
2. **Independents:**
   - Per Capita Food Manufacturers, 2009 (100k)
   - Per Capita Food Manufacturers, 2009 (100k) squared
   - Unemployment Rate (%), 2009
   - Population Density, 2009
   - ln(Per Capita Personal Income, 2009)
   - Share of Non-White Residents, 2009
   - Share of Foreign-Born Residents, 2009
   - Per Capita Specialty Food Services, 2009
   - Obesity Rate, 2009
   - Share of Amish Residents, 2009

Data

1. U.S. Census County Business Patterns, 2009 & 2017
2. American Community Survey (5-year estimates), Social Explorer, 2009
3. Obesity Rate: County Health Rankings & Roadmap, Wisconsin Population Health Institute, 2010
4. Amish population: The Young Center population estimates, 2009

	Per Capita Change in Food Manufacturers, 2009-2017 (100k)	OLS		HC5	
	(Intercept)	-58.438**	(-26.14)	-58.438**	(-26.349)
Economic Factors	**Per Capita Food Manufacturers, 2009 (100k)**	**-0.787*** **	(-0.232)	**-0.787*** **	(-0.257)
	Per Capita Food Manufacturers, 2009 (100k) squared	**0.017***	(-0.009)	0.017	(-0.011)
	Unemployment Rate, 2009 (%)	**1.378***	(-0.817)	1.378	(-0.834)
	Population Density, 2009	-0.285	(-10.403)	-0.285	(-17.81)
Social Factors	**ln(Per Capita Personal Income, 2009)**	6.209	(-5.258)	6.209	(-5.994)
	Share of Non-White Residents, 2009	-0.279	(-0.193)	-0.279	(-0.21)
	Share of Foreign-Born Residents, 2009	**1.181*** **	(-0.353)	**1.181*** **	(-0.399)
Food Trends	**Per Capita Specialty Food Services, 2009**	**0.300*** **	(-0.108)	**0.300*** **	(-0.109)
	Obesity Rate, 2009	**1.072***	(-0.573)	1.072	(-0.674)
	Share of Amish Residents, 2009	**0.296** **	(-0.134)	**0.296*** **	(-0.099)
	Observations	92			
	R^2	0.355			
	Adjusted R^2	0.275			
	Residual Std. Error	5.056 (df = 81)			
	F Statistic	4.458*** (df = 10; 81)			

Note: *p<0.1; **p<0.05; ***p<0.01

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Foreign-born Resident Effect

- Linguistic isolation in the local labor market often promotes entrepreneurship among the English-fluent immigrants (Mora & Dávila, 2005)
- Foreign-born populations could provide new niche markets

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Specialty Food Services

- Contractors, caterers and food trucks depend on processed inputs, which could lead to localized clustering (Schmit & Hall, 2013)
- Food trucks more resilient during 2007-2009 economic recession (Brennan, 2014)
- Gourmet good trucks could serve niche markets (McNeil & Young, 2019)

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Potential Amish Mechanisms

- Available labor source for food manufacturing
- High business creation and survival rates among Amish entrepreneurs (Kraybill et al., 2013)
- “Authenticity” of Amish label for goods, although Amish business owners are reluctant to use this leverage (McConnell & Loveless, 2018)

Food Manufacturing Growth amid COVID-19

- Municipalities could leverage diverse, niche communities
- Specialty food services could be a resilient market for food manufacturing goods, but there is also a trend towards at-home consumption
- More research needed to understand the influence of Amish communities
  - Amish population doubling every 21 years (Donnermeyer et al., 2019)
  - Could this influence flip, given COVID's likely high impact on Amish communities?

References:

Brennan, A. (2014). *Food-trucks in the US: Market research report.* Los Angeles, CA, USA: IBISWorld.

Capps, O., Fuller, S., & Nichols, J. (1988). Assessing Opportunities in Food and Fiber Processing and Distribution. *American Journal of Agricultural Economics, 70*(2), 462-468.

Davis, D., & Schluter, G. (2005). Labor-Force Heterogeneity as a Source of Agglomeration Economies in an Empirical Analysis of County-Level Determinants of Food Plant Entry. *Journal of Agricultural and Resource Economics* , 480-501. Donnermeyer et al., 2019

Fusaro, D. (2009, October 5). *Food Industry Trends 2010 - Priorities for the New Decade*. Retrieved from Food Processing: https://www.foodprocessing.com/articles/2009/foodindustrypriorities/

Goetz, S. (1997). State- and County-Level Determinants of Food Manufacturing Establishment Growth: 1987-1993. *American Journal of Agricultural Economics*, 838-850.

Henderson, J., & McNamara, K. (1997). Community Attributes Influencing Local FoodProcessing Growth in the U.S. Corn Belt. *Canadian Journal of Agricultural Economics*, 235-250.

Kraybill, D., Johnson-Weiner, K., & Nolt, S. (2013). *The Amish.* Baltimore, MD, USA: Johns Hopkins University Press.

Lambert, L., Wilcox, M., English, A., & Stewart, L. (2007). Ethanol Plant Location Determinants and County Comparative Advantage. *Journal of Agricultural and Applied Economics, 40*(1), 117-135.

References:

Low, S., Bass, M., Thilmany, D., & Castillo, M. (2020). Local Foods Go Downstream: Exploring the Spatial Factors Driving U.S. Food Manufacturing. *Applied Economic Perspectives and Policies*, 1–20.

McConnell, D., & Loveless, M. (2018). *Nature and the Environmental in Amish Life.* Baltimore, MD, USA: Johns Hopkins University Press.McNeil & Young, 2019

Mora, M., & Dávila, A. (2005). Ethnic Group Size, Linguistic Isolation, and Immigrant Entrepreneurship in the USA. *Entrepreneurship & Regional Development: An International Journal*, 389-404. Retrieved from https://www.tandfonline.com/doi/abs/10.1080/08985620500275612

Schmit, T., & Hall, J. (2013). Implications of Agglomeration Economies and Market Access for Firm Growth in Food Manufacturing . *Agribusiness: An International Journal*, 306-324.

Sloan, A. (2014, February). The Top Ten Functional Food Trends. *Food Technology*, pp. 22-44. Retrieved from https://www.ift.org/~/media/food%20technology/pdf/2014/04/0414_feat_1_toptentrends.pdf

Toops, D. (2012, January 12). *2012 Food Industry Outlook: A Taste of Things To Come*. Retrieved from Food Processing: https://www.foodprocessing.com/articles/2012/food-industry-outlook/

Share Grounds

A Model for Expanding Food Innovation Beyond the Academic Setting

Dr. Renee Threlfall
University of Arkansas System

DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

SHARE GROUNDS

CERTIFIED KITCHEN & DISTRIBUTION CENTER

Creating facilities at Arkansas county fairgrounds in:

- Marshall
- McCrory
- Rison

Share Grounds facilities offer:

- Produce Aggregation
- Product/Process Development
- Value-Added Production
- Regulatory Assistance

UofA DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System




Project Goals

Collaborate with county fair boards and community members to use existing fairground infrastructure to establish food innovation centers

Convert three fairground concession stands and warehouses to food manufacturing facilities for food production and aggregation

Provide university and extension education and technical assistance to expand opportunities for growth of farms and food businesses in local and regional markets

Diverse Project Funding

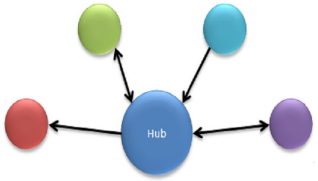
- Share Grounds project was initially funded by a federal grant but other diverse funding was needed to implement the project.
  - State and federal grants
  - Individual, industry, and nonprofit donations

USDA

SHARE GROUNDS
CERTIFIED KITCHEN & DISTRIBUTION CENTER
Where Food & Innovation Meet

SOUTHERN EXTENSION RISK MANAGEMENT EDUCATION

Hub and Spoke Model



Implemented a hub and spoke model to provide University and Extension expertise for food innovation opportunity in rural community settings

- **Hub**- team with expertise in food science, food safety, horticulture, agricultural marketing, and food regulation
- **Spoke**- local county extension staff, fair boards, and community advisors
- **Clients-** local farmers and entrepreneurs using Share Grounds sites
- **Link between Hub, Spoke and Clients-** part-time Share Grounds managers

Hub and Spoke Model

Arkansas Food Innovation Center


Dr. Renee Threlfall


John Swenson


Dr. Ruben Morawicki


Jack Lisle


Ashlynn Robinson

Local, Regional and Safe Foods


Dr. Amanda Philyaw Perez


Angela Gardner


Julia Fryer


Rip Weaver


Lisa Brown

County Agents


Diane Clement


Leigh Ann Bullington


Les Walz

Searcy County Share Grounds


Dawn Kelly

Three County Fair Share Grounds


Valour Taylor Cobbins

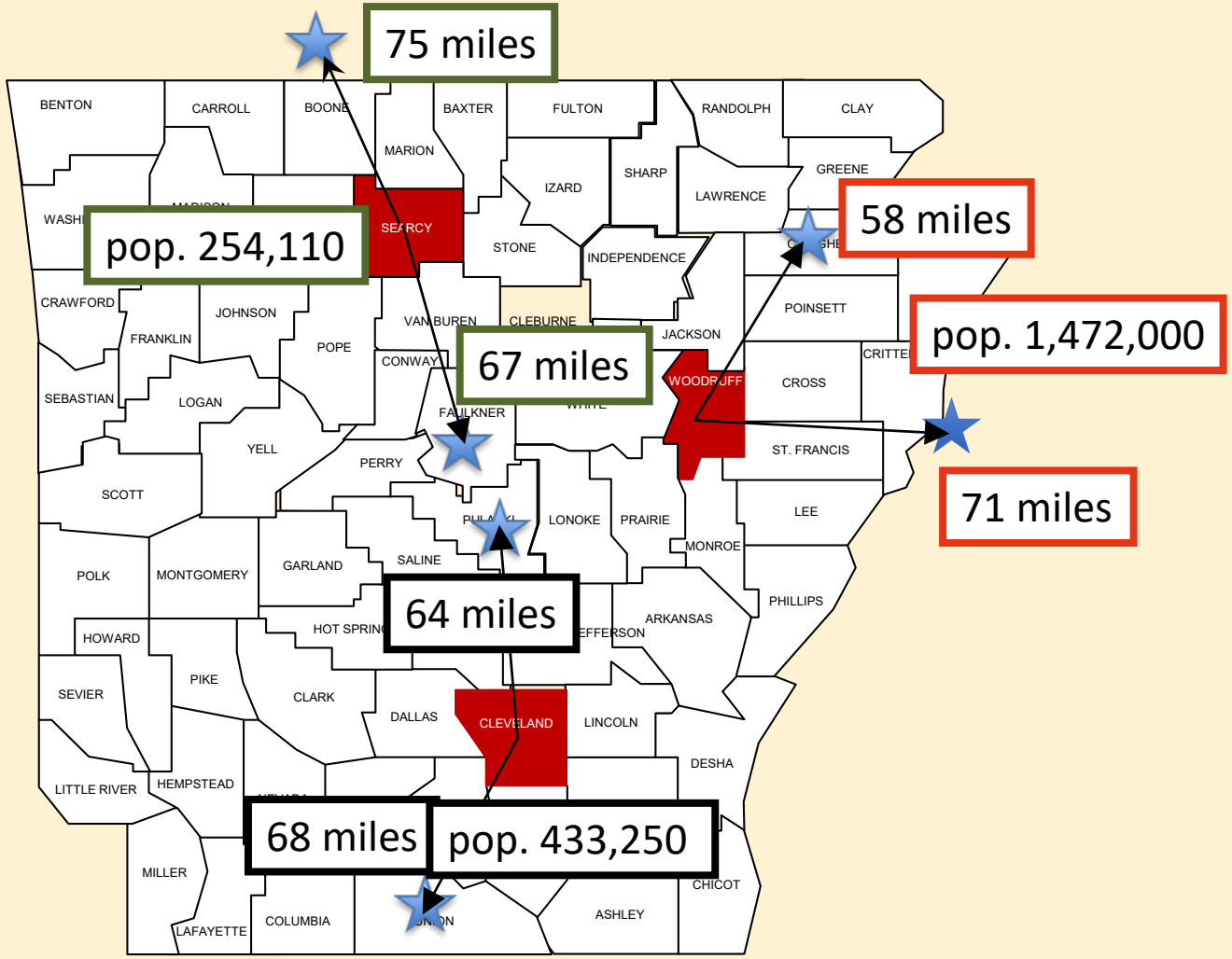
Cleveland County Share Grounds


Angela Gardner


Valour Taylor Cobbins




Arkansas Share Grounds Site



Source: U.S. Census Bureau, American Community Survey: 2013-2017

Cleveland County

BEFORE

AFTER

Searcy County

BEFORE

AFTER

Woodruff County (Three Co. Fair)

BEFORE

AFTER

Aims

- Food businesses in marketplaces
- Arkansas Made branding
- Trend for local retail
  - Local restaurants
  - Small grocers
- Business expansion
  - Potential for successful businesses to move beyond Arkansas borders through market connections with larger buyers (Walmart) and/or moving online (Amazon)

Client Intake Process

1

Review UAEX Resources

To make better informed business decisions, review the following pages:

- Share Grounds
- Cottage Food vs Manufactured Food
- How to Start a Food Business in Arkansas

2

Client Intake Form

Contact your local Share Grounds Manager to schedule an initial meeting and tour of the facility. Be prepared to discuss your food product and business strategy. During your meeting, you will receive a User Agreement, facility policies and a rental fee chart to review.

3

Market Research

Based on your meeting with the Manager, research retail options for your product and price shop ingredients and packaging for your product. Use these numbers to estimate your start up costs.

4

Purchase Insurance

In order to us the Share Grounds Kitchen, you must have product liability insurance in force. The Food Liability Insurance Program (FLIP) provides insurance to small food businesses (~$300/yr).

5

Trial Run

Schedule a time to run a trial batch of your recipe in the Share Grounds Kitchen. Bring a copy of your Insurance Policy and a signed User Agreement to the facility. This step may require multiple test batches to achieve the right recipe based on taste, quality and food safety.

6

Develop Operational Procedures

With the help of the manager, develop Standard Operating Procedures (SOP), Sanitation Standard Operation Procedure (SSOP), Recall Plan, Allergen Plan and other operational documentation for your food company.

7

Product Label

Develop a product label. The Product Labeling Information Guide provides information on mandatory label requirements. For a nominal fee, AFIC can create a Nutrition Facts panel for your product label.

8

Commercial Process Review

Prepare your application for the Arkansas Department of Health, Wholesale/ Manufactured Food permit. Review all paperwork and product label(s) with the Share Grounds site manager.

9

ADH Permit

Apply for a food manufacturing permit from the Arkansas Department of Health. Once approved, provide a copy to the Share Grounds Manager.

COVID-19 Impact and Adjustments

- Delayed openings
- Virtual meetings
- Sanitation procedures
- Social distancing

Share Grounds Clients & Products

- Share Grounds sites opened June 2020
- 20 clients initiating food product development
- Goal of producing 20 market ready, value-added food products
  - Salsa
  - Pickles
  - Teas/tinctures
  - **Commercial honey**
  - Seasonings
  - Pepper jelly
  - Frozen hand pies
  - Refrigerated yeast rolls
  - Pickled okra
  - Caramels and caramel sauce
  - Quinoa granola
  - Mayhaw jelly
  - **Soybean dip**
  - **Elderberry gummies**
  - “Farmer Protein Bar”
  - Freeze dried probiotic snack for kids
  - Caponata di melenzane (sicilian caponata sauce)
  - **Cricket flour**
  - Cornbread crackers
  - Hot sauce

Potential Outcomes

- Economic opportunity in rural communities
- Potential revenue stream for Fair Associations
- Client focus on product development/production
  - Creating a novel product
  - Cold-chain storage
  - Distribution relationships that are built-in
- Strengthening rural – urban linkages through food

For More Information

www.uaex.edu/sharegrounds

Dr. Amanda Philyaw Perez
Assistant Professor, Food Systems and Safety Specialist
Cooperative Extension Service, UA System
501-671-2228, **aperez@uaex.edu**

Dr. Renee Threlfall
Research Scientist
Food Science Department, UA System
479-575-4677, **rthrelf@uark.edu**

Angela Gardner
Program Associate, Local, Regional and Safe Foods
Cooperative Extension Service, UA System
501-671-2180, **agardner@uaex.edu**

Julia Fryer
Program Associate, Local, Regional and Safe Foods
Cooperative Extension Service, UA System
501-671-2181, **jfryer@uaex.edu**

If this project is successful, the hub-and-spoke model could be utilized in other regions.

Questions?

Developing Standardized Metrics for Reporting Farm-to-Institution Purchases

Jeffrey K. O'Hara – USDA Agricultural Marketing Service

1 of 11 pilot steering committee members

October 13, 2020

2020 Food Distribution Research Society Annual Meeting

Farm to Institution Programs Overview

- Anchor institutions have been strategically identified for local sourcing in U.S.
  - Large employers
  - On-site captive customer base
  - May receive public support
  - May have mission-focused objectives that align with local sourcing

- Institutions (USDA):
  - K-12 schools or preschools
  - Colleges or universities
  - Hospitals
  - Workplace cafeterias
  - Prisons
  - Food banks
  - Gleaners
  - Senior care facilities

Role of Intermediaries

- “Farm-to-intermediary-to-institution” a more accurate description of the supply chain than “farm-to-institution”
- This implies a tracking system is needed for institutions to report local food purchases
- Standardized tracking metrics are preferable to ad hoc tracking metrics:
  - Consistency and transparency in reporting
  - Supports cross-sector and regional comparison, aggregation, and evaluation
  - Reduces transaction costs on distributors

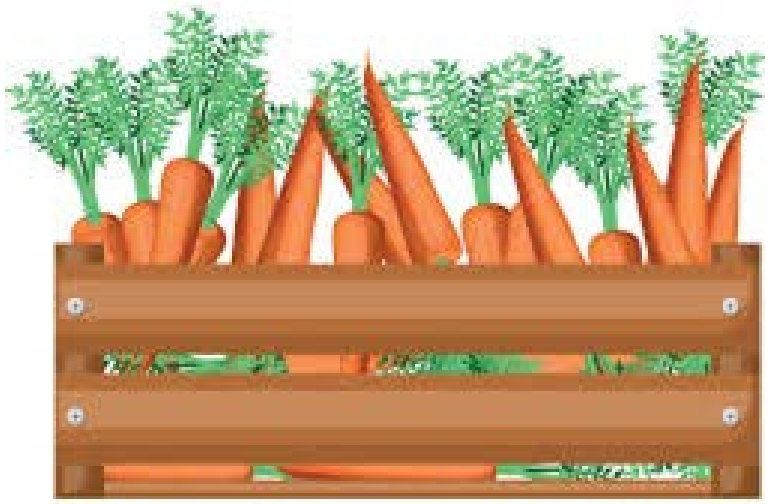
National FTI Metrics Collaborative

- The Collaborative consists of U.S. organizations that share information, resources, and best practices on measuring FTI programs

- The Collaborative launched a project to standardize farm impact metrics for FTI purchases

- Pilot steering committee:
  - University of Kentucky Food Connection
  - USDA Food and Nutrition Service
  - Farm to Institution New England
  - Michigan State University Center for Regional Food Systems
  - Center for Good Food Purchasing
  - USDA Agricultural Marketing Service
  - Health Care Without Harm
  - National Farm to School Network
  - Community Health Improvement Partners
  - Real Food Generation

Every product has multiple characteristics

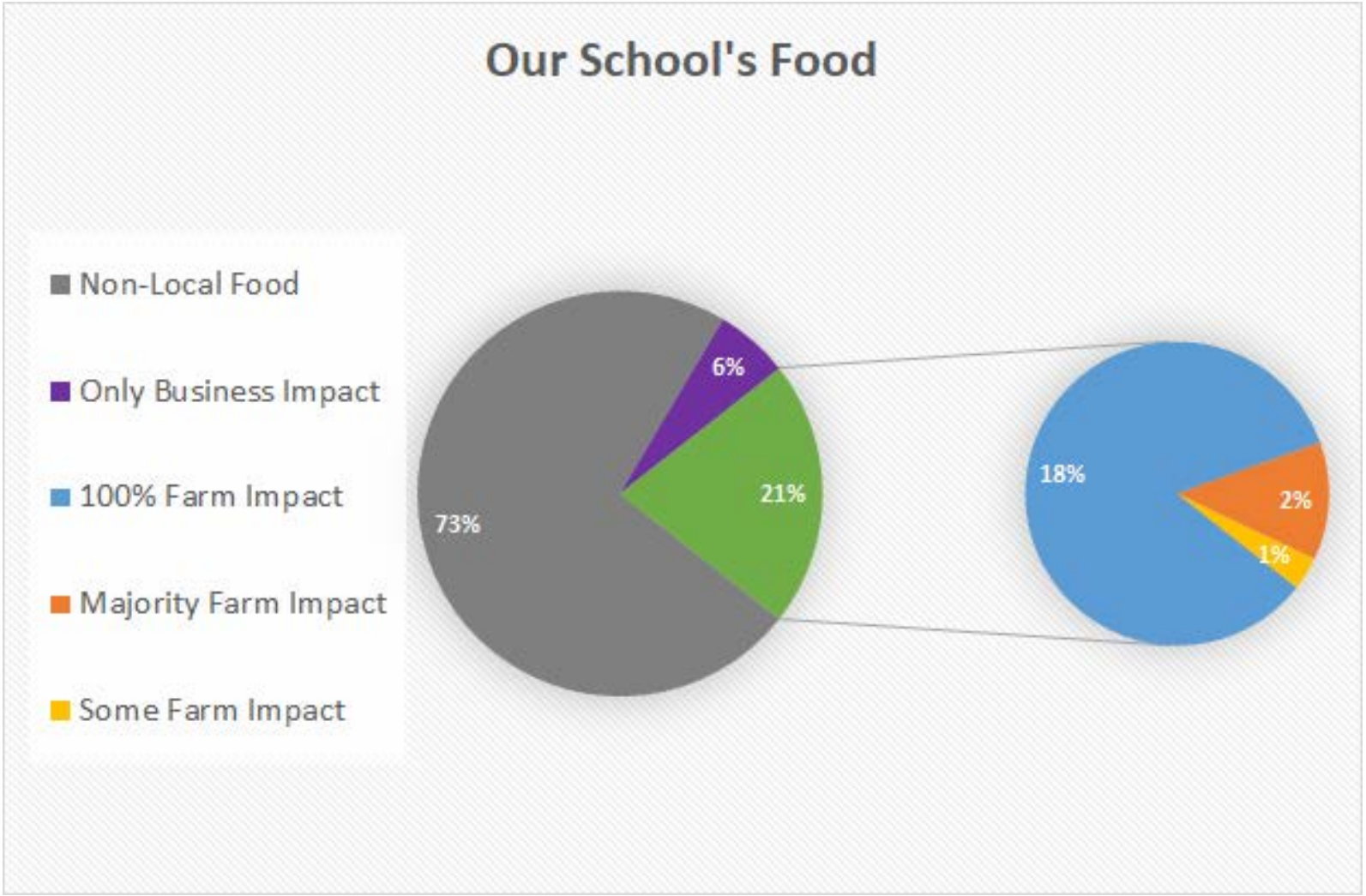


Carrots: Item # 1545
Business Type: _____
Ownership: _____
Farm Impact: _____
Farm Identity: _____
Product Type: _____
Market Channel: _____

Gather (self-defined) “local” purchases in template

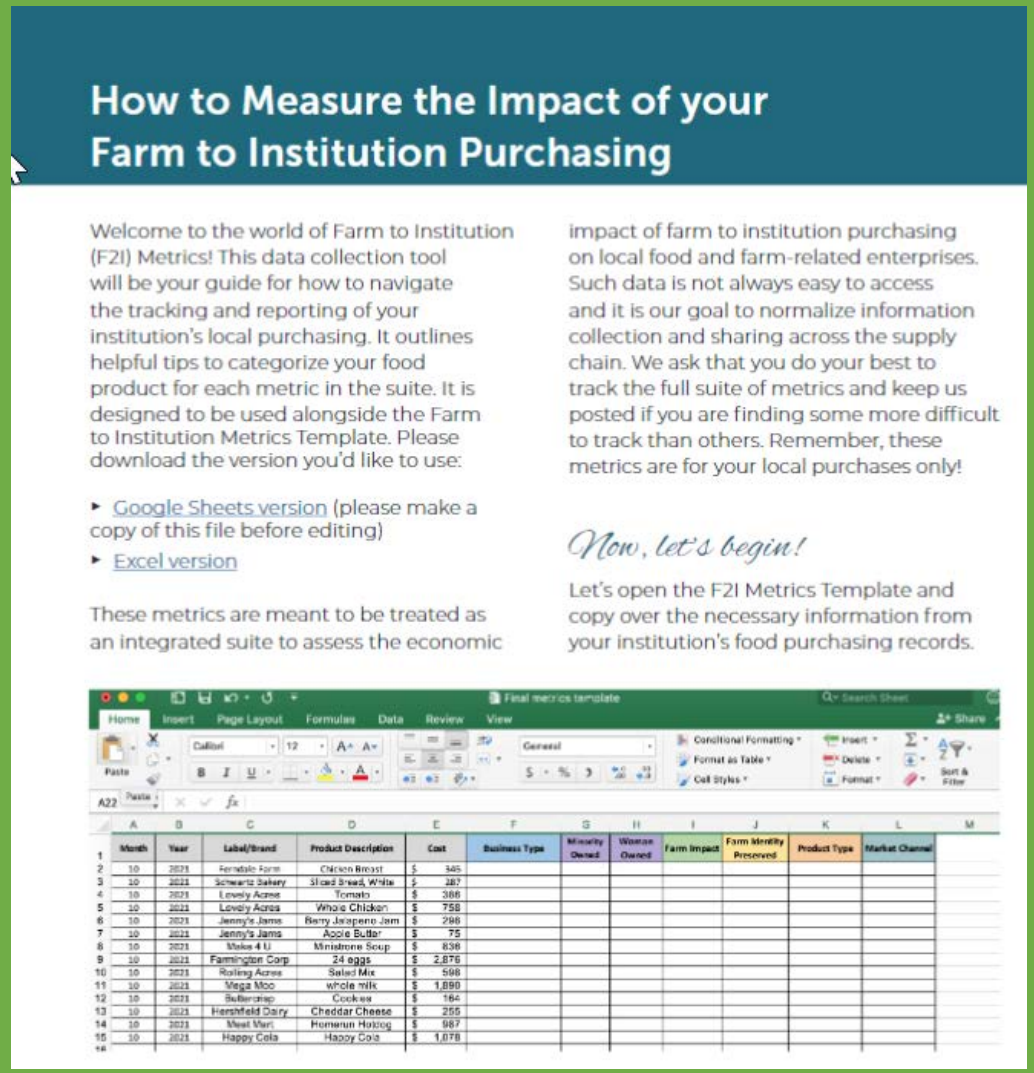
Month	Year	Label/Brand	Product Description	Cost	Business Type	Minority Owned	Woman Owned	Farm Impact	Farm Identity Preserved	Product Type	Market Channel
10	2021	Ferndale Farm	Chicken Breast	$ 346	Indi Farm	No	No	All	No	m&p	Distributor
10	2021	Schwartz Bakery	Sliced Bread, White	$ 287	Affiliative Business	Yes	No	None	No	bread	Direct
10	2021	Lovely Acres	Tomato	$ 386	Indi Farm	Yes	No	All	Yes	produce	Hub
10	2021	Lovely Acres	Whole Chicken	$ 758	Local Farm	Yes	No	All	Yes	m&p	Hub
10	2021	Jenny's Jams	Berry Jalapeno Jam	$ 298	Indi Farm	NO	Yes	Some	Yes	snack	Hub
10	2021	Jenny's Jams	Apple Butter	$ 75	Indi Farm	NO	Yes	Majority	Yes	snack	hub
10	2021	Make 4 U	Ministrone Soup	$ 836	Affiliative Business	No	No	None	No	entree	Distributor
10	2021	Farmington Corp	24 eggs	$ 2,876	Affiliative Business	No	No	All	No	egg	Distributor
10	2021	Rolling Acres	Salad Mix	$ 598	Indi Farm	No	No	All	yes	produce	Hub
10	2021	Mega Moo	whole milk	$ 1,890	Not Local	No	No	All	no	dairy	Distributor
10	2021	Buttercrisp	Cookies	$ 164	Affiliative Business	No	No	None	No	bread	Distributor
10	2021	Hershfield Dairy	Cheddar Cheese	$ 255	Indi Farm	No	No	All	yes	dairy	Distributor
10	2021	Meat Mart	Homerun Hotdog	$ 987	Indi Business	No	No	Majority	no	m&p	Distributor
10	2021	Happy Cola	Happy Cola	$ 1,078	Indi Farm	No	No	None	no	bev	Distributor

Tabulation Example – How does local sourcing impact farms?



Getting over the “local is whatever I say it is” hump

For more detailed instructions on how to use these metrics:



How to Measure the Impact of your Farm to Institution Purchasing

Welcome to the world of Farm to Institution (F2I) Metrics! This data collection tool will be your guide for how to navigate the tracking and reporting of your institution's local purchasing. It outlines helpful tips to categorize your food product for each metric in the suite. It is designed to be used alongside the Farm to Institution Metrics Template. Please download the version you'd like to use:

- Google Sheets version (please make a copy of this file before editing)
- Excel version

These metrics are meant to be treated as an integrated suite to assess the economic impact of farm to institution purchasing on local food and farm-related enterprises. Such data is not always easy to access and it is our goal to normalize information collection and sharing across the supply chain. We ask that you do your best to track the full suite of metrics and keep us posted if you are finding some more difficult to track than others. Remember, these metrics are for your local purchases only!

Now, let's begin!

Let's open the F2I Metrics Template and copy over the necessary information from your institution's food purchasing records.

https://ftimetrics.localfoodeconomics.com/

jeffreyk.ohara@usda.gov

Urban Agriculture: Who Benefits from California's Urban Agricultural Incentive Zones Act?

Samane Zare,
Postdoctoral Scholar, UC, Riverside

Jon C. Phillips
Professor of Agribusiness, Cal Poly Pomona

Lauren Hays
Recent M.S. Agriculture, Cal Poly Pomona

Urban Agriculture

- In 2013, AB 551 was introduced to the California Legislature to allow cities and counties to enact **Urban Agriculture Incentive Zones (UAIZ)**. The Bill allows landowners to enter into a 5-year contract with cities and counties to use vacant lots 0.1 to 3 acres for small-scale commercial and non-commercial agriculture.

- Properties would then be assessed at the same tax rate as irrigated crop land, adjusted proportionally by acreage. [California Legislative Information. (2013). AB 551 Local government: Urban agriculture incentive zones.]

- In 2017, AB 465 was enacted to extend authorization of UAIZ contracts into 2029. The purpose of AB 551 is to **promote sustainable urban farm enterprises in urban centers**.

Urban Agriculture

- Urban Agriculture provides various benefits for the individuals involved, including:
  - Economic (Cohen, 2016)
  - Health (Alaimo, et al, 2008), (Carney, et al, 2013)
  - Social impacts
    - Youth development opportunities (Cohen, 2016)
    - Addressing **food access and security** (Cohen, 2016), (Prové, (2015), (Siegner, et al, 2018)
    - Increased home values (Voicu & Been, 2008)
  - Public benefits such as providing green spaces and greenhouse gas emissions reductions (Lovell, 2010), (Deelstra & Girardet, 2000).

Research questions

- What are the socioeconomic and demographic characteristics of those who practice urban agriculture?
- Is UAIZ program effective in increasing the number of urban ag sites in California?
- Who is taking advantage of UAIZ?

Urban Ag in San Diego, CA

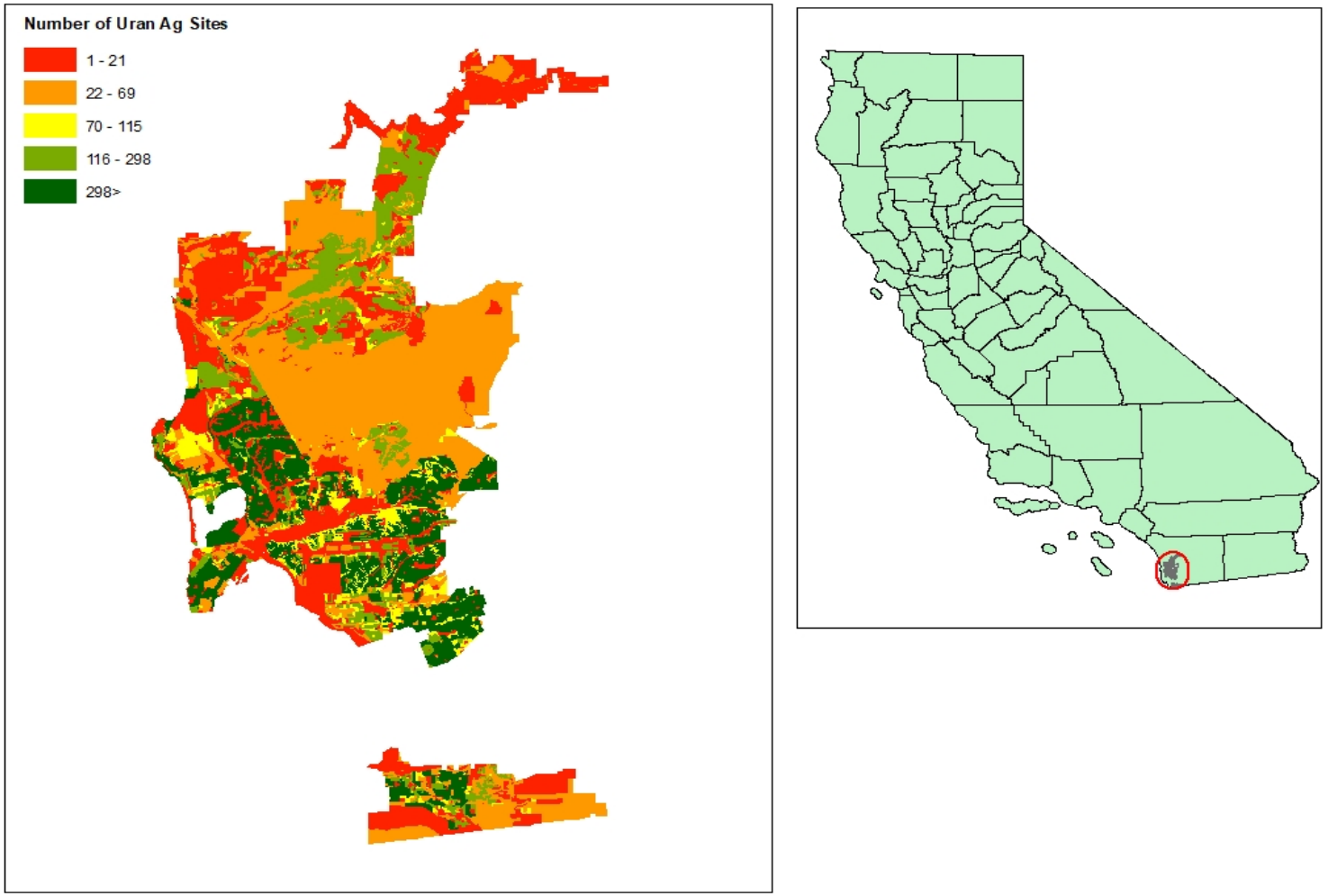


Figure 1. Total Urban Ag sites in San Diego in 2020 (Sum=2723).

Who practices urban agriculture?

Table 1. Variables Definition and Data Sources.

Variable Name	Description	Source
Number of Urban Ag Sites		San Diego County
Census Tract	Census Tract ID from 2010 Census	Census
Total Population	2010 population in census tracts	Census
Pollution Burden	Average of percentiles from the Pollution Burden indicators (with a half weighting for the Environmental Effects indicators)	Cal EPA
Education	Percent of population over 25 with less than a high school education	Census
Poverty	Percent of population living below two times the federal poverty level	Census
Unemployment	Percent of the population over the age of 16 that is unemployed and eligible for the labor force	Census
Percent population Children < 10 (%)		Census
Percent population Elderly > 65 (%)		Census
Percent White		Census
Percent African American		Census
Percent Hispanic		Census
Percent Asian		Census
Percent Other		Census
Income	Median income in 2010	Census

Who practices in urban agriculture?

Table 2. Factors Associated with the Number of Urban Ag Sites in San Diego, CA

	(1)	(2)	(3)	(4)
Population	1.827***	1.921***	1.954***	1.916***
Income	-0.568***	-0.498***	-0.404***	-0.559***
Education	0.883**	1.104***	1.243*	0.824
Unemployment	-0.385	-0.499	-0.959	-2.078**
Poverty	-0.540*	-0.491	-0.501	-0.745**
Children <10 (%)		-0.608	-0.858	-0.986
Elderly> 65 (%)		0.257	0.201	0.135
Hispanic (%)			-0.069	0.474
African American (%)			1.044*	0.842
Asian (%)			-0.203	-0.352
Pollution Burden				-1.578***
Observations	3,648	3,648	3,648	3,648

*** p<0.01, ** p<0.05, * p<0.1

Regression results: Summary

- Positive association between number of urban ag sites with population and education.
- Negative association between number of urban ag sites with median income level, poverty level, and unemployment rate
- Negative association between number of urban ag sites and pollution burden score.

Next steps (1)

- Until recently, urban agriculture was not widespread in California, leaving opportunities to increase adoption.
- In 2013 the state passed legislation AB 551, known as the "Urban Agriculture Incentive Zones (UAIZ) Act," that aims to increase the use of privately owned, vacant land for urban agriculture (UA).
- Since 2013, various cities in California, including San Francisco, Los Angeles, and San Diego, adopted the UAIZ Act provisions that provide a tax incentive for the owners to use private properties for UA purposes.

Next steps (2)

We intend to use ongoing UAIZ programs that have been implemented throughout the state's larger cities to investigate . . .

- Who is taking advantage of the UAIZ program, i.e., how the adoption rate differs across different income and demographic groups
- How the UAIZ program and its design will impact disadvantaged communities in any appreciable manner
- Whether the UAIZ program has the same effects in different cities

References

- Alaimo, K., Packnett, E., Miles, R., & Kruger, D. (2008). Fruit and vegetable intake among urban community gardeners. J. Nutr. Educ. Behav, 40: 94-101.
- California Legislative Information. (2013). AB 551 Local government: Urban agriculture incentive zones.
- Carney, P., Hamada, J., Rdesinski, R., Sprager, L., Nichols, K., Liu, B., Pelayo., Sanchez, M., & Shannon, J. (2013). Impact of a community garden project on vegetable intake, food security and family relationships: A community-based participatory research study. J. Community Health, 37(4): 874-881.
- Cohen, N. (2016). *Policy Brief: New Direction for Urban Agriculture in New York City*.
- Deelstra, T. and H. Girardet. (2000). “Urban agriculture and sustainable cities.” In N. Bakker, M. Dubelling, S. Gundel, V. Sabel-Koschella, and A. Zeeuw (eds.), *Growing Cities, Growing Food: Urban Agriculture on the Policy Agenda*. Feldafing, Germany: Food and Agriculture Development Centre (ZEL).
- Lovell, S. (2010) "Multifunctional urban agriculture for sustainable land use planning in the United States." *Sustainability* 2.8: 2499-2522.
- Prové, C. (2015). The role of urban agriculture in Philadelphia: A sociological analysis from a city perspective. (Summary Report). Institute for Agriculture and Fisheries Research.
- Voicu, I., & Been, V. (2008). The effect of community gardens on neighboring property values. Real Estate Economics, 36(2): 241-283.