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Please contact Lyn Kathlene, lyn@sparkpolicy.com, or Wendy Peters Moschetti, wendy@wpmconsulting.net with any questions or feedback.

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I. Brief Introduction & Overview

Background
In early 2010, the Colorado Department of Public Health and Environment (CDPHE) received a competitive (ARRA Component II) state-based award to advance food systems policy in Colorado. Much of this work was subcontracted to LiveWell Colorado to oversee implementation. One of the primary goals of the state’s ARRA grant is to: Support the enhancement and integration of urban, suburban, and rural policies in order to build a permanent farm to school program that supplies fresh and healthy food to Colorado’s students while benefiting Colorado’s agriculture economy.

An early task in developing farm to school (or any farm to institution) programs, is to better understand the state’s food system, and the state’s ability to produce, process, transport, sell, and consume a greater degree of state- and locally-grown fresh, healthy foods.

A specific task to achieve the ARRA goals is to develop a “Food Assessment Framework” – the FAF – which will collect information about every aspect of the state’s food system in one place and better equip local communities to do the same about their own food systems.

Vision of the Food Assessment Framework
The FAF will ultimately be a web-based, interactive tool that communities, regions, or state-level stakeholders could “mine” for information about certain aspects of the food system. The vision is to develop a comprehensive series of indicators, from which a community can select to best meet their needs, which provide information about the state’s capacity to produce, process, and transport healthy foods. Additionally, and equally as important, the FAF will provide detailed information about where data is kept, who manages it, how to access it, how to use it and talk about it, who might care about it, and other guidance.

Recently, the University of Missouri’s Center for Applied Research and Environment Systems (CARES) released an integrated online database platform, the CARES National Reporting Tool (NRT), the CARES National Interactive Maps (NIM), and the Community Commons¹, which have over 7,000 indicators pulled from many of the databases identified in the Colorado FAF’s four modules. For many communities, the NRT can serve as a “one-stop” site to pull down the secondary indicators in GIS maps and reports.

The online version of the FAF includes access to models, resources, and primary data collection instruments for all aspects of assessing the food system. The tool will enable communities across Colorado to conduct their own local food assessment. Communities will be better equipped to begin such a process, will see other completed models and examples, and will be guided to collect some of the same information as other communities across the state, therefore contributing to a strong, common body of knowledge about the food system across the state of Colorado.

¹ The Community Commons, launched on October 31, 2011, is a more recent version of NIM, which similarly has the capability to create personalized GIS maps with over 7,000 GIS layers to select among. Throughout the remainder of the Colorado FAF Overview, and the Production, Transportation, Processing, and Access reports, when the NIM is referred to, the Community Commons is interchangeable as a data source.
MORE INFORMATION ON THE FAF
To get started on your community food assessment, see the Colorado Food Assessment Framework: An Overview and How to Get Started. Once you have completed the initial organizing and planning activities, choose this module or one or more of the other modules to dig into those aspects of the food system that are important to your community.

FOOD ASSESSMENT FRAMEWORK COMPONENTS: FOOD PROCESSING
A community food assessment measures food security, or the “condition in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice” (Community Food Security Coalition, 2006). A food assessment not only directly measures the availability and accessibility of food, but considers the overall food system—or the degree to which production, processing, distribution, consumption and waste activities are connected in one’s community. Increasingly, only several global corporations direct processing of food, resulting in less local and regional business participation, and a heightened degree of travel involved in distribution, leaving local food systems dependent on outside partners (Pothukuchi, Joseph, Burton, & Fisher, 2002).

In 2002, the US Department of Agriculture (USDA) produced a Community Food Security Assessment Toolkit that recommends examining 6 basic variables in order to determine community food security. Although none of those 6 relate directly to food processing, Pothukuchi and colleagues (2002) emphasize additionally considering the proportion of foods purchased locally that are processed locally—either within the region or state. A measurement of local food processing would not only include the number of manufacturers, but additionally variables such as the proportion of local cropland devoted to processing, the degree of value-added processing, and the economic impact of local processing. A community focus on food security is guided by the intent to bolster a community’s food resources, resulting in reduced distances for food to travel in order to serve community food needs (Unger & Wooten, 2006).

II. FOCUS ON FOOD PROCESSING
THE ORIGINS OF FOOD PROCESSING
Presently multiple cross-system trends such as obesity, rapid fossil fuel consumption, urban sprawl, and underemployment reflect challenges influencing and emerging from food systems (Unger & Wooten, 2006). Agricultural trends such as consolidated production, increased farm size, and an international labor force have elicited concerns regarding water, increased pollution from fertilizers, chemical use, soil loss, and significant heightened energy usages (Ericksen, 2008). Food processing is the component of the food system where food is transferred from production to consumption, through any methods of value-adding or packaging (Unger & Wooten, 2006). Value-added processing has reached unprecedented levels, resulting in production becoming the least profitable economic component of the food system (Ericksen, 2008). Due to heightened technology and globalization, food typically travels extended distances, and is processed with more fats, chemicals, salt, and sugar (Popkin, 2004). Such food is bred for industrial processing and significant travel distances, instead of freshness and nutrition (Thompson,
Consumers, likewise increasingly consume more inexpensive processed food from fast food and sit-down restaurants than food prepared at home, contributing to the obesity epidemic (see Figure 1). Although increased efficiency and productivity of food systems has aided in reducing hunger in parts of the world, looming threats such as social, political, and economic change jeopardize the sustainability of these systems (Ericksen, 2008). Quality of and access to food, as well as the high level of environmental impact have been critiqued as unsatisfactory, indicating a weakness among the connections between food production, processing, distribution, consumption, and waste. Alternatively, a regionally centered food system diminishes fiscal inefficiencies, pollution and waste, and creates jobs and general economic stimulus (Carter-Whitney, 2010).

**Figure 1. Weight of Food Consumed by Food Source.** *

*Adapted from Thompson (2008).

Transformations in the food system disadvantage local farmers and community economies (See Figure 2). Through biotechnology and consolidation of production, 75¢ per dollar invested in the food chain is expended on processing, packaging, shipping, advertising, and retail (Lyson, 2004). As a result, food production earns little of total food profits, most of which are awarded to transportation, packaging, advertising, energy, and labor costs. Increased reliance on foreign food production further rewards large manufacturers that process cheaply priced food, and compromises food security, as natural disasters or conflict would weaken or destroy such a consolidated supply chain. According to the Toronto Food Policy Economy (2006), local food processing provides one of the most significant economic outputs among manufacturing activities, and is closely connected to related sectors, such as tourism, biotechnology, packaging, and advertising. Through providing jobs for low-skill workers, retaining industry, and incubating urban food production and processing, localized manufacturing can dramatically impact local economy (Unger & Wooten, 2006). Local processing can also aid in import
substitution, where consumers would have the opportunity to select locally manufactured products in place of imported products (Martinez et al., 2010).

**Figure 2. Food Policy: Old and New.**

<table>
<thead>
<tr>
<th>Food system feature</th>
<th>Traditional food systems</th>
<th>Modern food systems</th>
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<tbody>
<tr>
<td>Principal food sector employment</td>
<td>In food production</td>
<td>In food processing, packaging and retail</td>
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<td>Supply chain</td>
<td>Short, local</td>
<td>Long with many food miles</td>
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<tr>
<td>Food production system</td>
<td>Diverse, varied productivity</td>
<td>Few crops predominate; intensive, high inputs</td>
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<tr>
<td>Typical farm</td>
<td>Family-based, small to moderate</td>
<td>Industrial, large</td>
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<td>Typical food consumed</td>
<td>Basic staples</td>
<td>Processed food with a brand name; more animal products</td>
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<tr>
<td>Food source</td>
<td>Small, local shop or market</td>
<td>Large supermarket chain</td>
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<td>Nutritional concern</td>
<td>Under-nutrition</td>
<td>Chronic dietary diseases</td>
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<tr>
<td>Main source of national food shocks</td>
<td>Poor rains; production shocks</td>
<td>International price and trade problems</td>
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<tr>
<td>Main source of household food shocks</td>
<td>Poor rains; production shocks</td>
<td>Income shocks leading to food poverty</td>
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<tr>
<td>Major environmental concerns</td>
<td>Soil degradation, land clearing</td>
<td>Nutrient loading, chemical runoff, water demand, greenhouse gas emissions</td>
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<tr>
<td>Influential scale</td>
<td>Local to national</td>
<td>National to global</td>
</tr>
</tbody>
</table>


In addition to the impact that a corporatized food system has on local farmers and economies, there are serious concerns regarding sustainability. The looming future of reduced oil production threatens the contemporary food model (Unger & Wooten, 2006), which heavily relies on fossil fuels for consolidated mechanized production and processing. Because many small farmers have started producing under contract with large food production firms, food is decreasingly produced, processed, sold, and composted within communities (Unger & Wooten, 2006). As a result, on average, between 7 and 10 calories of fossil fuel energy are required to transport 1 calorie of food to customers (Pollan, 2006), and food is transported 1300 miles between producer and consumers (Hill, 2008). In order to reduce such energy waste, proper infrastructure, including vehicles, temperature controlled storage facilities, processing facilities, and waste recovery programs must be developed to create sustainable and localized food manufacturing (Martinez et al., 2010).

Diminishing natural resources, and the threat of geo-global environmental and social instability, jeopardize the sustainability of the present consolidated food production and processing industry. Communities dedicated to food security must integrate a consideration of food processing capacity in their food assessments.
DEFINING FOOD PROCESSING

There are several concepts that can be examined regarding the types of data and information in this module. Depending on the goals of a community, the indicators can be assessed to convey a variety of concepts. Some of the concepts that may be important to communities include those defined here. An important early step for any state or community is to identify and agree on what concept is critical to convey—in other words, what are the primary (or at least initial) values and goals of the process? A state or community could focus in on understanding a variety of these concepts.

III. FOOD PROCESSING INDICATORS

Assessing a community’s food processing involves a range of considerations. Indicators of robust local manufacturing include a description of local food processors, whether small producers have access to processors, whether processors permit sustainability of the food system, and how local processors economically impact a community.

1. **What Do Our Local Manufacturers Look Like?** Profile of typical community manufacturers

2. **Are Community Farmers Able to Access Food Processors?** Assessment of whether local producers can afford or produce sufficient volume to use community processors

3. **Do Processors Facilitate a Sustainable Local Food System?** Assessment of whether manufacturing permits the preservation, recycle, and reuse of locally produced food

4. **What Is the Economic Impact of Local Processing?** Assessment of the fiscal stimulus and jobs produced in the community due to local processing

5. **Does our Community Value Local Processing?** Assessment of whether community policies support or hinder local processing.

1. **WHAT DO OUR LOCAL MANUFACTURERS LOOK LIKE?**

Value-Addition

Food manufacturing increases the value of food, creating “value-added” products, through processing and/or packaging, allowing it to be sold for a higher price. Over the prior 30 years consolidated production and centralized processing has decreased the number of small-scale processors (Carter-Whitney, 2010). The disappearance of processors from rural and urban communities can result in “redundant trade,” where a product is imported to a region it is also exported from, due to remote processing (Carter-Whitney, 2010). Further, longer supply chains result in less communication between producers, processors, and consumers (Carter-Whitney, 2010). A lack of local processing plants and post-harvest handling facilities further isolates small producers from entering direct markets, incentivizing local farmers to contract with large corporate producers to grow commodity crops (Carter-Whitney, 2010). High concentration of value-added food processors provides excellent links to suppliers and/or customers throughout the entire food sector (Unger & Wooten, 2006). An insufficient number of
local food manufacturers reduces the opportunity for local value-added processing to keep food within the local system and hinders the identification of locally-produced products (Carter-Whitney & Miller, 2010; Thompson, Harper, & Kraus, 2008). The value added to food through the manufacturing process provides a measure of the strength of the food manufacturing industry (Unger & Wooten, 2006).

SECONDARY DATA

Indicators of value-addition:
All data for value-addition indicators may be found at the US Economic Census.

- **Number of Food Manufacturers**: Industries in the Food Manufacturing subsector transform livestock and agricultural products into products for intermediate or final consumption. The industry groups are distinguished by the raw materials (generally of animal or vegetable origin) processed into food products. The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers, but establishments primarily engaged in retailing bakery and candy products made on the premises not for immediate consumption are included.

- **Food Manufacturers Net Value Added to Products**: The average value added to products by local manufacturers through processing and/or packaging.

PRIMARY DATA

Another informative indicator of value-addition would be the number of high value-added processors. Presently there are no known data sources, and primary data collection must be conducted. However, products processed for product markets rather than commodity markets are more likely to be high value added. High value added processors have the potential to increase average income and employment opportunities locally.

2. ARE COMMUNITY FARMERS ABLE TO ACCESS FOOD PROCESSORS?

Small-Scale Processing

Farms that are able to process their own raw foods may have additional sales and income opportunities (Martinez et al., 2010; Vallianatos, Gottlieb, & Haase, 2004). However, for farmers unable to process products on their land, access to small-scale processors provides another opportunity. As with small farms, smaller plants may face unique challenges. Co-op commercial kitchens and kitchen incubators allow small-scale food processors to share or rent space, reducing costs and increasing opportunities for small businesses (Carter-Whitney & Miller, 2010). Cooperative organizations where a group of farmers use the same production, processing, and distribution systems to serve several direct outlets, such as farmers markets and Farm to School programs, can diminish risk of sale shocks (Martinez et al., 2010). Cooperative systems also enable joint financial planning among a group of small processors and producers—where waste for one may be important material for another (Carter-Whitney, 2010).

Small farmers are not the sole community members affected by a lack of food processors. Due to a lack of infrastructure, many schools have eliminated their kitchens entirely in favor of precut and processed
produce (Vallianatos et al., 2004). However, programs such as Farm to School provide resources for schools to increase kitchen processing capacity in order to process locally purchased raw vegetables, potatoes, and meat (Martinez et al., 2010).

SECONDARY DATA

Indicators of small-scale processing:
Data for the first indicator may be found at the US Census of Agriculture. The number and location of Farm to School programs is located at the available at the National Farm to School Network, the USDA Food Environment Atlas, and the CARES National Interactive Maps platform. Regarding the third indicator, a list of meat processing plants in Colorado is available from the Colorado Department of Agriculture. However, no known national source is available, nor is a source listing plants by USDA classification. Commercial kitchens may be found at Culinary Incubator.

- **Percent of Crop Land Devoted to Processing**: Measures what proportion of acres are devoted to food processing or manufacturing out of total farm acres.
- **Number and Types of Farm to School Programs**: This indicator would measure the number of Farm to School programs in an area, which reflects greater ability to process fresh/raw foods in school kitchens.
- **Number of USDA-FSIS Small and Very Small Plants**: Small plants have between 10 and 500 employees and very small plants are those with fewer than 10 employees or annual sales of less than $2.5 million.
- **Number of Co-Op Commercial Kitchens or Kitchen Incubators**: Co-op commercial kitchens and kitchen incubators enable small-scale food processors to share or rent space.

3. **DO PROCESSORS FACILITATE A SUSTAINABLE LOCAL FOOD SYSTEM?**

Food Preservation
Proper infrastructure, such as temperature controlled vehicles, and storage facilities are essential to developing a sustainable and functioning food system (Martinez et al., 2010). Preserving foods for out of season use (such as freezing, canning, etc.) permits consumption of local foods year round (Carter-Whitney & Miller, 2010; Martinez et al., 2010). Food preservation also strengthens food security, where ideally, cities should be capable of supplying one third of their own food year round, in case of natural disasters or conflict (Mann, 2002).

PRIMARY DATA

One indicator useful in reflecting community capacity for food preservation is the number and location of businesses that preserve food through dehydration, freezing, or canning food for year-round use. Presently there are no known data sources, and primary data collection must be conducted.
Waste Recovery
Food waste, or the process of collecting, sorting, and converting discarded food into reusable or recyclable materials, contributes to the food system functioning through “closing the food loop” (Unger & Wooten, 2006). Food materials are a substantial proportion of waste streams, and in one Oakland study, food was the most common waste in 1995, 2000, and 2008 (StopWaste.org, 2009). Food waste can either be an output (discarded) or an input (recycling or composting waste). Increasing the use of waste as an input reduces output and the use of nonrenewable resources, produces compost for local agriculture, and prevents edible food from being discarded (Unger & Wooten, 2006). Local processing affects waste through reducing food packaging, diminishing the proportion of non-biodegradable packaging among output. The presence of both food processing and waste recovery strengthen local economy through requiring greater collaboration among local stakeholders, such as farmers, manufacturers, local labor force, waste haulers, and the city (Unger & Wooten, 2006).

PRIMARY DATA

The number of food waste recovery programs is a useful indicator of a community’s capacity for waste recovery. Food waste recovery programs collect, sort, process, and convert discarded food materials into reusable food or other materials used in the production of new products. Data on relative costs regarding alternatives to waste disposal are also relevant to determining a communities’ present cost of disposal, and potential savings through alternatives. Presently there are no known data sources, and primary data collection must be conducted.

Processor Carbon Footprint
Centrally processed food relies heavily on nonrenewable fossil fuel inputs. Due to diminishing oil production, the necessity developing community based processors is urgent (Unger et al., 2006). Despite the common emphasis on transportation of food as a major GHG producer, in fact, food processing and household consumption and storage employ a greater proportion of energy use than transportation (Heller & Keoleian, 2007).

PRIMARY DATA

Presently, there are no known data sources on community manufacturing carbon footprint, and primary data collection must be conducted.
4. **What is the Economic Impact of Local Processing?**

**Economic Effects from Community Processing**
A transition from centralized, corporate processing to regional processing would benefit local communities regarding both efficiency and economic growth (Carter-Whitney, 2010). A localized processing system would reduce economic redundancies, curtail environmental pollution, create new jobs, and keep economic revenue within the community (Carter-Whitney, 2010). According to Betsy Donald, this new “craft” economy would distinguish itself from the present “Kraft” infrastructure, where centralization, consolidation, and globalization dominate (Carter-Whitney, 2010).

**SECONDARY DATA**

- **Number and Economic Impact of Food Manufacturing Businesses**: Economic impact includes measures such as wages, employment, and contribution to gross state product.

5. **Does Our Community Value Local Processing?**

**Policies**
Local policies are necessary to support small-scale community processing, as federal tax and regulatory policies tend to benefit large-scale centralized processors (Carter-Whitney, 2010). Local policies can facilitate community processors through streamlining fees and permit processes for smaller or urban processors, and through instituting land use planning that retains industrial land for food processing (Carter-Whitney, 2010).

**PRIMARY DATA**

The presence of flexible certification and industrial land-use planning policies is a useful indicator of a community’s support for local processing. Ideal local regulatory policies respect existing regulatory policies while creating unique guidelines for farm-based and urban processors. Policies that encourage on-farm processing training and certification would incentivize local farmers to consider on-farm processing, maintaining manufacturing expenses within a community. Further, policies that retain city land for food processing and allocate money for processing plant upgrades enable processors to afford city land, and retain productivity and sustainability through technological advances. Presently there are no known data sources for these indicators, and primary data collection must be conducted.
IV. IMPLEMENTATION TOOLS

RECENT REPORTS AND RESEARCH EXAMINING LOCAL PROCESSING

Food Preservation Network
The Food Preservation Network is a new project that intends to increase community capacity to preserve food. A pilot is being conducted in Minneapolis through the University of Minnesota during the Fall of 2010.

PRIMARY DATA COLLECTION INSTRUMENTS

1. Do Processors Facilitate a Sustainable Local Food System: Tools for Collecting Primary Data

Tools from Colorado:
Northern Colorado Regional Food Assessment (2011). The assessment provides baseline data of the regional food system in Boulder, Larimer and Weld counties. The final report can be accessed at http://www.larimer.org/foodassessment/report.cfm. Specific data collection tools include questions for focus groups and interviews with community members and key stakeholders in the food system. Food system areas covered include: production, processing, and access.

   Guidance for Conducting a Food Assessment
   Project Overview Survey
   Inputs to Agriculture: Labor and Purchases
   Inputs to Agriculture: Natural Resources
   Agricultural Production: Crops and Livestock
   Agricultural Production: Evolution of Farms
   Processing, Distribution, and Marketing: Consumer Buying Preferences
   Processing, Distribution, and Marketing: Where do we Shop and Eat
   Public Health & Nutrition: Role of Food in Health
   October Open House Questionnaire
   Online Survey

Tools from across the Country:
Business Emissions Calculators
   Cool Climate Small Business Footprint Calculator
The Cool Climate Business Calculator allows businesses to calculate total carbon footprint for facilities, including food manufacturing, and transportation. The calculator also compares output to similar organizations and offers recommendations to lower carbon footprint.

Life Cycle Assessment (LCA)
The OpenLCA project is in the process of creating free software for life cycle analysis and sustainability assessments. LCA may be applied to assess the impact of food chains from cradle-to-grave, such as GHG emissions.
**Food Waste Management Cost Calculator**

An individual, organization, or community can compare cost estimates and environmental impacts for disposal versus recycling or reuse of food waste. The instructions explain how to collect the data and use the calculator. The calculator is an Excel file.

- Food Waste Management Calculator Instructions
- Food Waste Management Calculator spreadsheet

Communities may also join the WasteSense Program to divert waste from land-fills, minimize water-intensive production processes, and lower use of paper products.

**Food Recovery Challenge**

The EPA’s Food Recovery Challenge asks participants to reduce as much of their food waste as possible – saving money, helping communities, and protecting the environment. The Challenge is part of EPA’s Sustainable Materials Management Program, which seeks to reduce the environmental impact of materials through their entire life cycle, including how they are extracted, manufactured, distributed, used, reused, recycled, and disposed.

**Smart BET Calculator**

The Saving Money and Reducing Trash Benefit Evaluation Tool (Smart BET) aides community waste managers in deciding whether unit-based pricing for solid waste management is appropriate for their city. Unit-based pricing treats trash services similar to other utilities, where household rates depend on the amount of service used, unlike the traditional model where waste collection is funded through property taxes or a fixed fee.

- SmartBET Calculator

**Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks**

The Environmental Protection Agency (EPA) created the Waste Reduction Model (WARM) to assist waste planners and organizations or municipalities in monitoring and reporting GHG emissions reductions. WARM determines the comparative GHG emission and energy usage of baseline and alternative materials management practices—such as source reduction, recycling, combustion, composting, and landfilling. The calculator is available as a web-based tool and a downloadable Excel spreadsheet. The details of the data, methods, and calculations that are the basis for the WARM emission factors is available on the WARM website.

- WARM web-based calculator
- WARM Excel spreadsheet calculator
**APPENDIX A: FOOD PROCESSING MATRIX**

<table>
<thead>
<tr>
<th>Category (geographic level)</th>
<th>Indicator (geographic level)</th>
<th>Rationale</th>
<th>Data Source Location that CARES Accesses</th>
<th>Indicator available on the CARES?</th>
<th>CO Priority for CARES &amp; Notes</th>
<th>Location on the CARES Platforms &amp; Indicator Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value-addition</td>
<td>Number of food manufacturers</td>
<td>NAICS definition for food manufacturer: &quot;Industries in the Food Manufacturing subsector transform livestock and agricultural products into products for intermediate or final consumption. The industry groups are distinguished by the raw materials (generally of animal or vegetable origin) processed into food products. The food products manufactured in these establishments are typically sold to...</td>
<td>US Economic Census, <a href="http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t">http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t</a></td>
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<td>1</td>
<td>1. National Interactive MAPS-Drop Down Menu Path</td>
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<td>2. National Reporting Tool</td>
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<td>Drop Down Menu Path</td>
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- Not available. Must be uploaded by community
- Not available. Must be uploaded by community
wholesalers or retailers for distribution to consumers, but establishments primarily engaged in retailing bakery and candy products made on the premises not for immediate consumption are included." Food manufacturing increases the value of food, allowing it to be sold for a higher price. An insufficient number of local food manufacturers reduces the opportunity to keep food within the local system and prevents the identification of locally-produced products (Carter-Whitney & Miller, 2010; Thompson, Harper, & Kraus, 2008).
<table>
<thead>
<tr>
<th>Food manufacturers net value added to products</th>
<th>State-level data are available from the US Economic Census, <a href="http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t">http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t</a>; some county-level data are available.</th>
<th>No</th>
<th>1</th>
<th>Not available. Must be uploaded by community</th>
<th>Not available. Must be uploaded by community</th>
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<tbody>
<tr>
<td>Number of high value-added processors</td>
<td>High concentration of value-added food processors provides excellent links to suppliers and/or customers throughout the entire food sector (Unger &amp; Wooten, 2006).</td>
<td>No</td>
<td>Would be primary data collection by communities</td>
<td>Not available. Must be uploaded by community</td>
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<td>Number and Economic impact</td>
<td>US Economic</td>
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<td>Not available.</td>
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<td>Economic impact of food manufacturing businesses (NAICS codes):</td>
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<td>Animal food manufacturing</td>
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<td>Grain and oilseed manufacturing</td>
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<td>Sugar and confectionary product manufacturing</td>
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<td>Fruit and vegetable preserving and specialty food manufacturing</td>
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<td>Dairy product manufacturing</td>
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<td>Animal slaughtering and processing</td>
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<td>Includes measures such as wages, contribution to employment, and contribution to gross state product (Magnusson &amp; Gittell, 2010).</td>
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<td>Census, <a href="http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t">http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t</a></td>
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<tr>
<td>Small-scale processing</td>
<td>Percent of crop land devoted to processing</td>
<td>Farms that are able to process their own raw foods may have additional sales and income opportunities (Martinez et al., 2010).</td>
<td>No known source for an exact measure, but similar values may be approximated using data from the US Census of Agriculture, <a href="http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1_Chapter_2_Co">http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1_Chapter_2_Co</a></td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>Number of USDA-FSIS Small and Very Small Plants</td>
<td>The USDA classifies processing plant size by number of employees. As with small farms, smaller plants may face unique challenges.</td>
<td>A list of all meat processing plants in Colorado is available from <a href="http://www.col">http://www.col</a></td>
<td>No</td>
<td>1</td>
<td>Not available. Must be uploaded by community</td>
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<tr>
<td>Food Processing</td>
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<tr>
<td><strong>Number of co-op commercial kitchens or kitchen incubators</strong></td>
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<tr>
<td>Co-op commercial kitchens and kitchen incubators allow small-scale food processors to share or rent space, reducing costs and increasing opportunities for small businesses (Carter-Whitney &amp; Miller, 2010).</td>
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<td>Culinary Incubator provides a GIS map and list of kitchen rentals by state: <a href="http://www.culinaryincubator.com/maps.php">http://www.culinaryincubator.com/maps.php</a></td>
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<table>
<thead>
<tr>
<th>Food Preservation</th>
</tr>
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<tbody>
<tr>
<td><strong>Number/locati on of businesses that preserve foods for out of season use</strong></td>
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<tr>
<td>Preserving foods for out of season use (such as freezing, canning, etc.) allows consumption of local foods year round (Carter-Whitney &amp; Miller, 2010;</td>
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<tr>
<td>No known source- primary data collection needed</td>
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<tr>
<td>No</td>
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<tr>
<td>Would be primary data collection by communities</td>
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<tr>
<td>Waste Recovery</td>
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<tr>
<td>Policies</td>
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</tbody>
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REFERENCES


Vallianatos, M., Gottlieb, R., & Haase, M. A. (2004). Farm-to-school: Strategies for urban health,