

# Abstract of the Madison Region's Agriculture, Food and Beverage Industry Cluster



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# Introduction

Contemporary economic development strategies recognize that regional assets are the true drivers of employment and income growth. The Madison Region is endowed with many potential assets, including competitive industry concentrations; high levels of human and social capital; robust physical infrastructure; and unique natural resources. While these assets influence many aspects of the regional economy, a notable number are connected in food production, processing and consumption. Diverse agricultural producers; established food and beverage manufacturing enterprises; nascent entrepreneurs; university resources; and a skilled labor force all provide a foundation for growing the region's agriculture, food and beverage industries.<sup>1</sup> However, the mere presence of these regional strengths does not guarantee future prosperity. Instead, the Madison Region must find ways to leverage these food-related assets in innovative manners that build economic opportunities, but also maintain the region's quality of life.

Over the past two decades, industry cluster initiatives have become a popular means for leveraging competitive assets in communities and regions. While a more in-depth discussion is provided below, industry clusters are geographically-concentrated businesses that are connected through 1) the products they produce; 2) the supplies, services, infrastructure and technologies they require; and 3) a common labor force. In other words, industry clusters are "groups of industries closely related by skill, technology, supply, demand, and/or other linkages" (Delgado, Porter and Stern 2014, p. 2). Importantly, industries in a cluster also share some level of common opportunities and threats. Developing an industry cluster initiative around the region's agriculture, food and beverage (AFB) sectors provides one opportunity for addressing any potential opportunities and threats by ultimately making these industries more competitive.

The Madison Region certainly possesses the necessary components to build an AFB cluster. However, Southern Wisconsin is by no means the only region attempting to build a cluster around its food-related assets. Cities, regions and states across the nation are aggressively pursuing cluster opportunities in the areas of food manufacturing; agricultural production; food and agricultural technology; and other related industries. *The challenge for the Madison Region is to build the AFB cluster around its comparative advantages in a manner that differentiates itself from other food-related cluster initiatives.* Accordingly, this abstract's primary goal is to begin understanding the region's AFB cluster in a way that identifies its potential comparative advantages.

## Understanding Industry Clusters

While industry clusters are popular as economic development strategies, cluster initiatives are often misunderstood and misused. Many economic development practitioners fail to understand how clusters operate from a theoretical perspective, leading to poor participation of cluster stakeholders and improper implementation. Consequently, identifying potential sources of comparative advantage for the AFB cluster requires a basic understanding of industry cluster theory. Importantly, potential cluster stakeholders do not

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<sup>1</sup> The recently completed *Advance Now* economic development strategy formally identifies agriculture and food systems as a legacy industry target or cluster initiative that holds promise for the Madison Region.

need an in-depth knowledge of this theory, but they should recognize how cluster components interact with each other.

As previously suggested, industry clusters are groups of industries connected by skills, technologies, supply chains, demand sources and other linkages. More commonly, industry clusters are “geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g. universities, standards agencies, trade associations) in a particular field that compete but also cooperate” (Porter 1998 p. 197). Several key terms in this definition provide guidance for this study of the region’s AFB cluster:

- *Industry clusters involve interconnected companies, specialized suppliers, service providers, and firms in related industries* - The concept of clusters goes beyond the recognition of a single industry sector or classification. The cluster acknowledges important connections and relationships among industries and other business types that support each other through supply chains and service provision. In theory, the presence of these quality local suppliers and services creates efficiencies and increases firm competitiveness. For instance, nearby firms in the AFB cluster’s supply chain might offer lower transportation costs, provide quicker delivery, or create better access to support;

The recently completed *Advance Now* comprehensive economic development strategy broadly defines the agriculture, food and beverage (AFB) cluster to include industries related to plant and animal cultivation; food processing (including beverages); and food systems development and distribution. While these categories include a breadth of industries, they do not encompass the full spectrum of enterprises that would be considered part of an AFB cluster initiative. The region’s AFB cluster certainly includes food and beverage manufacturing establishments and agricultural producers in the region. However, the cluster also includes businesses that support food producers and processors through supply chains and other types of support including packaging materials, equipment manufacturing, waste treatment, and professional and technical services (Figure i.1);

- *Industry clusters include associated institutions* – Industry clusters are not comprised solely of for-profit, private-sector firms. Industry clusters recognize the potential assistance and knowledge spillovers (transfers) that universities, trade associations, and government agencies can provide.<sup>2</sup> The participation of these institutions in cluster-based initiatives can provide research, labor training, advocacy, and other support for cluster establishments. While the Madison Region Economic Partnership (MadREP) will be a key partner in developing the AFB cluster, the initiative will also depend on support and participation from state agencies; other economic development organizations; local municipalities; educational institutions; workforce development entities; and non-profit enterprises that work with AFB-related businesses;

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<sup>2</sup> Knowledge transfers can also occur among individual firms in an industry cluster.

Figure i.1 –Examples of Industries in the Agriculture, Food and Beverage Cluster

### Agricultural Production

Oilseeds and Grains	Vegetable and Melons	Fruits and Tree Nuts	Other Crops	Beef, Poultry, Eggs and Pork	Dairy Producers	Seafood and Other Animal Products
<u>Examples:</u>	<u>Examples:</u>	<u>Examples:</u>	<u>Examples:</u>	<u>Examples:</u>	<u>Examples:</u>	<u>Examples:</u>
<ul style="list-style-type: none"> <li>• Canola</li> <li>• Soybeans</li> <li>• Safflower</li> <li>• Cottonseed</li> <li>• Corn</li> <li>• Oats</li> <li>• Barley</li> </ul>	<ul style="list-style-type: none"> <li>• Squash</li> <li>• Melons</li> <li>• Greens</li> <li>• Cabbage</li> <li>• Carrots</li> <li>• Potatoes</li> <li>• Beans</li> </ul>	<ul style="list-style-type: none"> <li>• Apples</li> <li>• Cherries</li> <li>• Pears</li> <li>• Bananas</li> <li>• Berries</li> <li>• Citrus</li> <li>• Almonds</li> </ul>	<ul style="list-style-type: none"> <li>• Sugar cane</li> <li>• Sugar beets</li> <li>• Maple syrup</li> <li>• Herbs</li> <li>• Spices</li> <li>• Hops</li> </ul>	<ul style="list-style-type: none"> <li>• Beef cattle</li> <li>• Veal calves</li> <li>• Chickens</li> <li>• Turkeys</li> <li>• Ducks</li> <li>• Pheasant</li> <li>• Eggs</li> </ul>	<ul style="list-style-type: none"> <li>• Dairy cattle and milk production</li> </ul>	<ul style="list-style-type: none"> <li>• Fish</li> <li>• Shellfish</li> <li>• Goats and goat milk</li> <li>• Wild game</li> <li>• Apiculture</li> <li>• Bison</li> </ul>

### Food and Beverage Manufacturing

<b>Grain and Oilseed Milling</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Flour</li> <li>• Malt</li> <li>• Rice</li> <li>• Corn Syrup</li> <li>• Starches</li> <li>• Oils</li> <li>• Breakfast cereals</li> </ul>	<b>Sugar &amp; Confectionery Products</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Cane sugars and syrups</li> <li>• Molasses</li> <li>• Chocolate bars</li> <li>• Cocoa products</li> <li>• Candies and gum</li> <li>• Granola Bars</li> </ul>	<b>Dairy Products</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Fluid Milk</li> <li>• Cheese</li> <li>• Butter</li> <li>• Whey &amp; Casein</li> <li>• Yogurt</li> <li>• Ice Cream</li> <li>• Infant Formula</li> </ul>	<b>Animal Processing</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Fresh Beef, Pork, Lamb, or Poultry</li> <li>• Sausages</li> <li>• Bacon and Ham</li> <li>• Animal fat and oil rendering</li> <li>• Cured meats</li> </ul>	<b>Fruit and Vegetable Preserving &amp; Specialty Foods</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Fruit Juices</li> <li>• Frozen/canned vegetables</li> <li>• Frozen Dinners</li> <li>• Pizzas</li> <li>• Tomato and Pasta Sauces</li> <li>• Jams and Jellies</li> <li>• Soups</li> </ul>
<b>Seafood and Other Animal Products</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Fresh fish</li> <li>• Frozen seafood</li> <li>• Pre-prepared seafood dinners</li> <li>• Canned seafood</li> <li>• Seafood soups</li> </ul>	<b>Bakery and Tortilla Products</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Fresh and Frozen Breads</li> <li>• Tortillas</li> <li>• Pies and cakes</li> <li>• Pastries</li> <li>• Fresh or dried pasta</li> <li>• Cookies and crackers</li> </ul>	<b>Other Food</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Chips</li> <li>• Coffee roasting</li> <li>• Spices and extracts</li> <li>• Sauces and dips</li> <li>• Mayonnaise</li> <li>• Fresh prepared vegetables</li> </ul>	<b>Soft Drinks and Ice</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Soft drinks</li> <li>• Flavored drinks</li> <li>• Iced tea</li> <li>• Bottled water</li> <li>• Ice</li> </ul>	<b>Breweries, Wineries and Distilleries</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Beer</li> <li>• Wine</li> <li>• Cider (alcoholic)</li> <li>• Distilled liquor</li> <li>• Packaged mixed drinks (alcoholic)</li> </ul>

### Support Services and Distribution

<b>Packaging Materials</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Plastic, metal and glass containers</li> <li>• Paperboard boxes</li> <li>• Plastic films and bags</li> <li>• Printing services</li> </ul>	<b>Machinery and Equipment</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Food product machinery</li> <li>• Packaging machinery</li> <li>• Conveyors and handling equipment</li> <li>• Farm equipment</li> <li>• Equipment repair</li> </ul>	<b>Professional and Technical Services</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Soil sciences</li> <li>• Accounting</li> <li>• Marketing</li> <li>• Food testing</li> <li>• Engineering and design</li> <li>• Veterinary</li> </ul>	<b>Utilities</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Electrical power generation</li> <li>• Natural gas distribution</li> <li>• Water and wastewater</li> </ul>	<b>Distribution</b> <u>Examples:</u> <ul style="list-style-type: none"> <li>• Farm, grocery and related wholesale</li> <li>• Truck and rail transportation</li> <li>• Logistics services</li> <li>• Warehousing</li> </ul>
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- *Industry clusters have a geographic concentration* – Clusters and their associated components are concentrated in a distinct geographic area. Geographic concentration allows for increased interaction and efficiencies to be developed among companies in a cluster. While the exact geographic extent of a cluster will depend on a variety of factors, the geographic scope of a cluster relates to the distance in which informational, transactional, incentive, and other efficiencies occur (Porter 2000). Accordingly, the geographic boundaries of clusters are defined by inter-company relationships and *not* political boundaries (Rosenfeld 2001). While the geographic area for this cluster analysis is based on a pre-determined geography (see below), there may be instances where AFB cluster opportunities extend into nearby areas. The State of Wisconsin also has a statewide food manufacturing cluster effort that should complement and support the Madison Region’s AFB cluster initiative;
- *Industry cluster firms compete, but also cooperate* - Individual firms within an industry cluster are in competition with each other, but also exhibit a level of cooperation. Cooperation in an area allows firms to engage in activities such as joint-contract bidding; developing custom labor force training programs; coordinating research efforts; providing a unified voice on industry-wide issues; and improving their industry’s visibility. The precondition of cooperation requires that private industry stakeholders and industry champions have key roles in an industry cluster. *Without cooperation, a region does not have an industry cluster, but rather a simple industry concentration of loosely-related firms.* Broad participation of cluster firms in the Madison Region will be vital to the success of an AFB cluster initiative. The true challenge is providing authentic motivations to firms and stakeholders that engage them in the cluster.

## Study Area and Broader Context

The AFB study area is a 14-county region that stretches across south-central and southwest Wisconsin (Figure i.3). The study area is divided into two separate regions: the eight-county Madison Region served by the Madison Region Economic Partnership and a six-county “Driftless Region.” The Madison Region consists of Columbia, Dane, Dodge, Green, Iowa, Jefferson, Rock, and Sauk counties. The six-county Driftless Region used in this analysis includes the counties of Crawford, Grant, Monroe, Lafayette, Richland and Vernon.<sup>3</sup> While these Driftless Region counties are served by other regional economic development organizations (Prosperity Southwest and 7 Rivers Alliance), the area has numerous economic and geographic connections to the Madison Region that are important components of the AFB Cluster.

As suggested earlier, it is also important to recognize that the AFB Cluster in the Madison Region is part of a larger food production and processing economy in the State of Wisconsin. The cluster is important as agricultural producers and food/beverage manufacturers make notable contributions to Wisconsin’s gross domestic product (GDP). An industry’s GDP is measured as its total output (e.g. sales) minus the cost of goods and services used in the production process. In other words, an industry’s GDP is a measure of the value added to the economy through its labor and capital located in a state.<sup>4</sup> In 2012, food and beverage

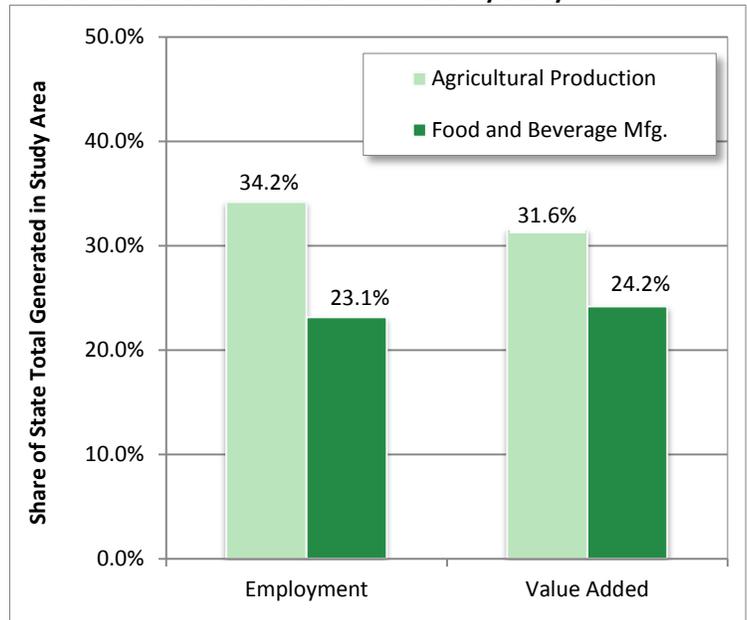
<sup>3</sup> The Driftless Region is a part of a larger area across the Upper Mississippi River Basin that was unglaciated during the most recent continental glacial period, resulting in steep, undulating topography.

<sup>4</sup> As noted by IMPLAN, value added consists of compensation of employees, taxes on production and imports (less subsidies) and gross operating surplus (e.g. proprietor’s income, corporate profits, depreciation, etc.).

manufacturing accounted for 2.6 percent of Wisconsin’s GDP. *While this figure may seem small, only nine states derived a higher share of their GDP from food and beverage manufacturing.* Similarly, agriculture production (farms) contributed 1.8 percent of Wisconsin’s GDP, placing it 13<sup>th</sup> among all states (Figure i.4).

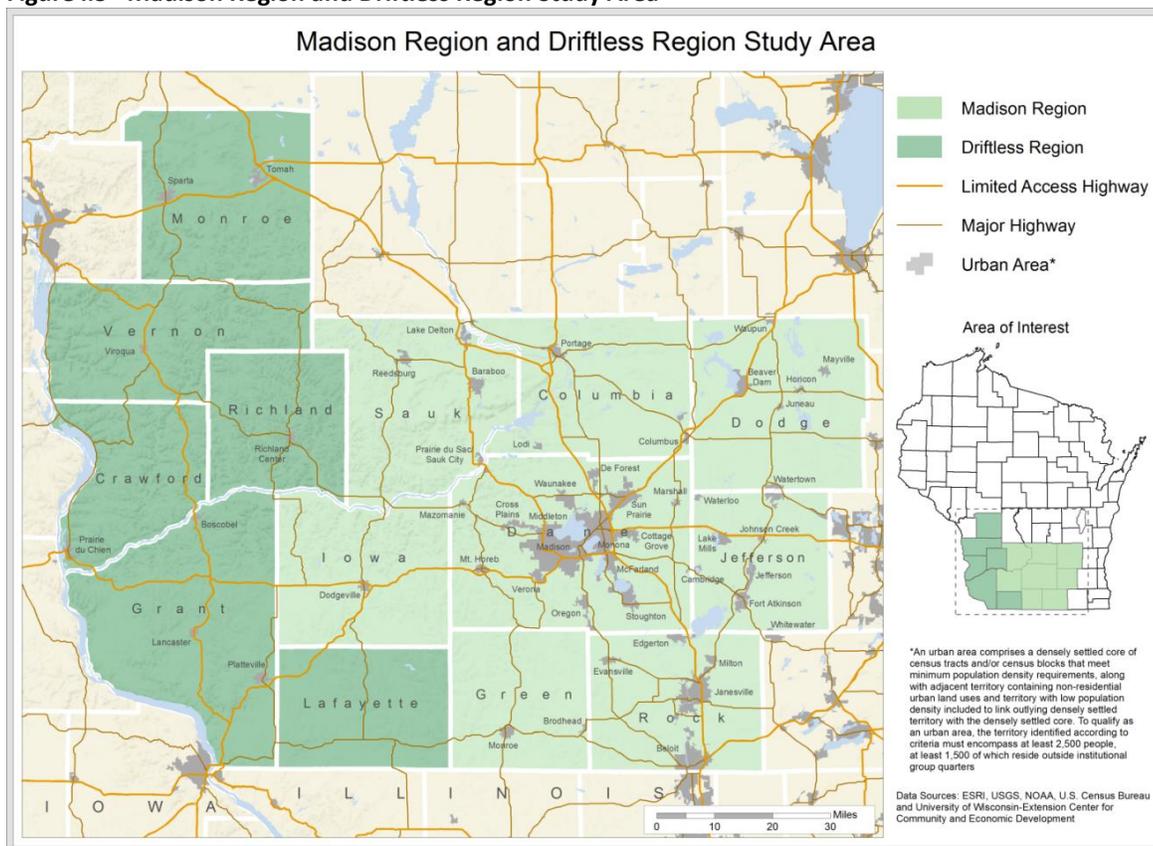
Food and beverage manufacturing establishments and agricultural production enterprises in the 14-county study area are responsible for notable contributions to the state’s concentration of these industries. While the study area accounts for 20.7 percent of the state’s population, the region produces an estimated 31.6 percent of Wisconsin’s total value added (GDP) in agricultural production and 24.2 percent in food and beverage manufacturing (Figure i.2). Similarly, the study area contributes 34.2 percent of Wisconsin’s total employment in agricultural production and 23.1 percent of food and beverage manufacturing employment. Consequently, the success of the state’s food production and processing economy is largely dependent upon industries in the study area.

**Figure i.2 – Wisconsin’s Employment and Value Added in Agricultural Production and Food and Beverage Manufacturing – Share of State Total Generated in 14-County Study Area**

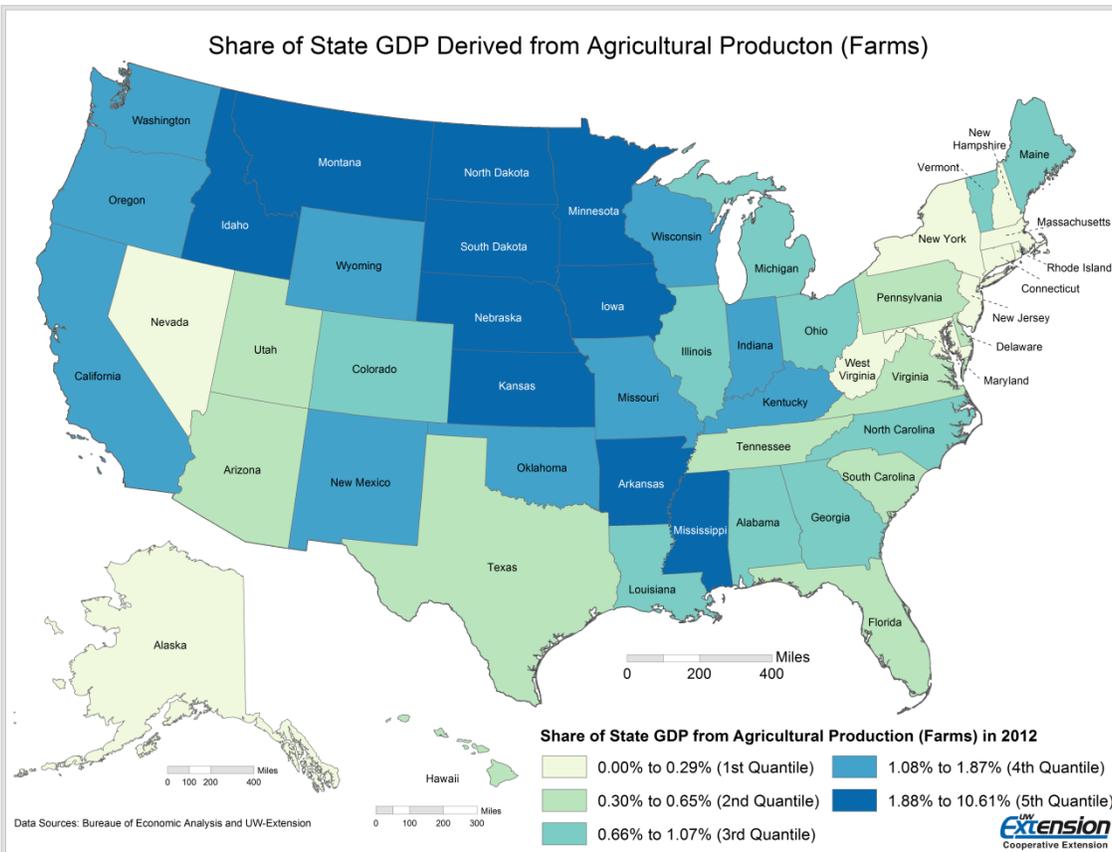
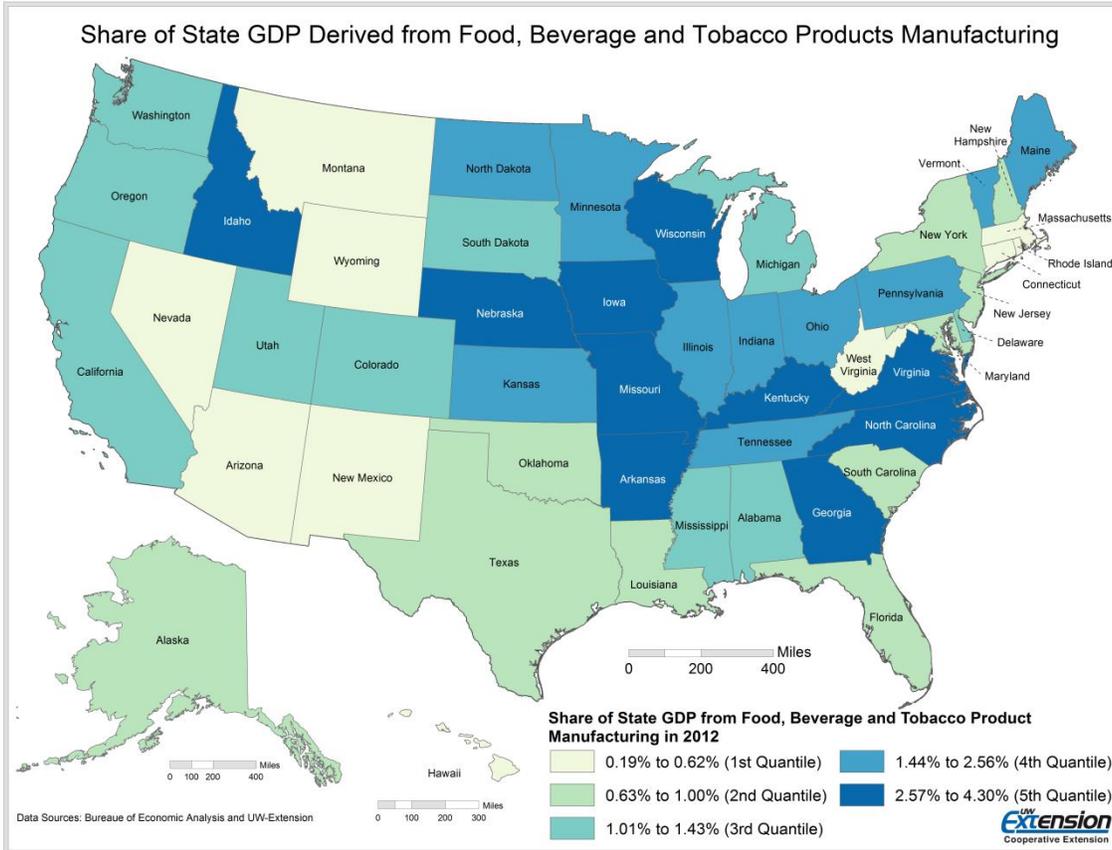


Source: IMPLAN

**Figure i.3 –Madison Region and Driftless Region Study Area**



**Figure i.4 – State GDP Contributions of Food, Beverage and Tobacco Manufacturing and Agricultural Production**



## Report Outline

Based on the preceding discussion, a successful AFB cluster initiative will require: 1) understanding the needs of the region's agricultural production enterprises and food/beverage manufacturing firms; 2) identifying potential supporting industries and supply chains; 3) developing the cluster's labor force; 4) enhancing the competitive environment; and 5) building opportunities for collaboration and engagement. To explore these cluster requirements, the remainder of this AFB cluster abstract is organized as follows:

- *Section 1- Employment and Establishments in the Region's Food and Beverage Manufacturing Industries* – This section considers the numbers and types of food and beverage manufacturing establishments in the region and their employment levels. Section 1 provides important context into the magnitude and direction of these industries in the region and across the United States;
- *Section 2 - Agricultural Production* – The study area has a large and diverse number of agricultural producers. Section 2 explores the types of agricultural products produced in the region; financial and operational characteristics of farms; and farm employment trends;
- *Section 3 – Support Industries, Demand Perspectives and Distribution Considerations* – Section 3 considers industries that potentially support the AFB cluster through technical assistance; facilities management and operation; packaging; distribution; and other services. The analysis attempts to suggest where potential gaps and disconnects in supply chain support may exist in the region. Section 3 also examines consumer demand across national and international markets;
- *Section 4 – AFB Human Capital* – The competitiveness of an industry cluster is partially driven by the quality of its labor force, entrepreneurs and research capacity. Section 4 evaluates occupations, wages, age distributions, and other characteristics of human capital tied to the AFB cluster.
- *Section 5 - Positioning the AFB Cluster for Success* - Cluster implementation is perhaps the most challenging component of the cluster development process. Implementation is process-intensive and requires developing a shared identity and clear vision supported by cluster stakeholders. Section 5 considers a general overview of implementation in the context of a competitive, rapidly-changing industry cluster;

Finally, readers of this abstract should note that the broad appeal of cluster initiatives often leads to high expectations for results. Despite all of the proposed benefits to regions and firms, it is important to recognize that the success of clusters as an economic development strategy is uncertain, even when fully understood and properly implemented. While examples of successful cluster initiatives exist, empirical evidence on the ability of clusters to increase competitiveness, generate job growth, and produce new economic activity is being actively debated among researchers (for examples see: Palazuelos 2005; McDonald et al 2007; Motoyama 2008; Woodward 2012; and Delgado et al 2014). *Nonetheless, the lack of conclusive evidence does not mean that regions should abandon cluster initiatives. Clusters can succeed with proper guidance and participation. Furthermore, industry clusters remain beneficial as a framework for analyzing the AFB industries as they can identify the potential connections and synergies among firms in the region.*

