

from our
FIELDS
to our
TABLES



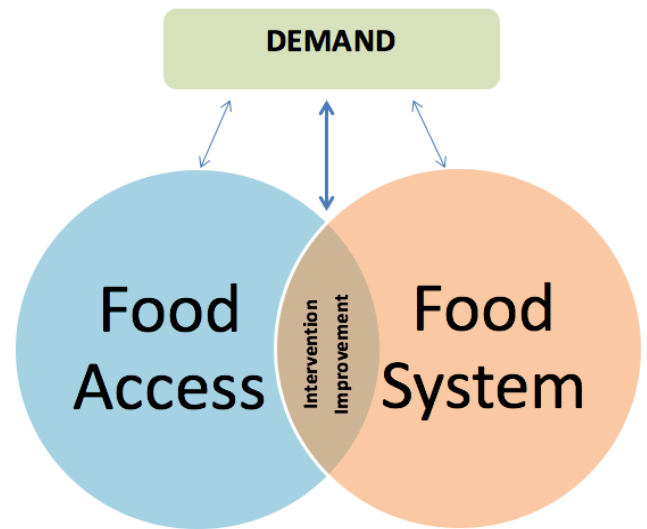
We Need **Good Food** to have **Good Health**

There's a seed of truth in the old saying "an apple a day keeps the doctor away." A healthy diet, including plenty of fruits and vegetables, is a key part of staying healthy and avoiding many chronic diseases, like heart disease, diabetes, and obesity. Health professionals have spent many years educating about the importance of a healthy diet and motivating individuals to eat healthy foods. However, the rate of obesity and diet-related diseases has increased steadily over that same time. We now understand that, although education is important, choosing to eat healthy foods is determined largely by the context in which we live. We tend to eat what our friends and family eat. And we most often eat what is available, affordable, delicious, and easy. Many factors contribute to this "food-context", including:

- Environmental issues – like the distance of a store that sells healthy foods from our home or the safety of our neighborhood.
- Economic issues – like the ability to afford to purchase healthy foods or the ability to afford a vehicle or other reliable transportation to obtain healthy food.
- Legislation issues – like the nutritional requirements of meals served in K-12 schools and other institutions.
- Regulation issues – like requirements placed on food producers and vendors.

There is no doubt that education plays an important role in the process of choosing healthy foods, but it must accompany other interventions that address the context of our communities in order to influence health behaviors on a large-scale level.

Be Healthy Berrien and Berrien County Health Department have embarked on a project to learn more about the food context in Berrien County. Through this project, we have asked questions about the population living in Berrien County, how these people purchase food, how food is grown and sold in Berrien County, and what efforts have been implemented to help consumers and growers address their food-related challenges. We've created this report to tell the story of food in Berrien County. The data contained in this report is the best available data obtainable at the time of publication. For more detailed information on the data included in this report as well as additional data sets, please see the appendix beginning on page 13.



"Food access is not simply a health issue but also a community development and equity issue. For this reason, access to healthy, affordable, and culturally appropriate food is a key component not only in a healthy, sustainable local food system, but also in a healthy, sustainable community." (American Planning Association)

A Food System is all the people, processes and places involved with moving food from the seed the farmer plants to people's plates. This includes production, processing, distribution, consumption and waste management.

Consumer demand influences supply within the food system and determines the number and types of food store that consumers have access to, and the quality and type of food products available to them.

In order to improve food access, the food system must be included in intervention planning, to ensure that enough food is produced and distributed in ways that meets the needs of the entire community.



THANK YOU!



Our Plot of Land

Berrien County is located in Michigan's beautiful Great Southwest, bordering Indiana to the South and Lake Michigan to the West. Home to world-class parks, beaches, golfing, and wineries, some areas in Berrien County are attractive tourist destinations and popular localities for those with second homes. However, the majority of the county is rural, with a large amount of agricultural land. The county also contains a few urbanized areas with high levels of poverty, racial and ethnic inequities, and limited social resources.

Much like the rest of the United States, the residents of Berrien County are experiencing negative health affects associated with adverse environments and the Standard American Diet. Opportunities for unhealthy eating have expanded and processed food is more obtainable than ever. While gas stations used to exist primarily for vehicle maintenance and pharmacies supplied medication and health supplies, these places are now primary sources of food for many households. This has led to changes in the way we eat in terms of frequency, amount, and types of food. The methods for producing healthy foods have changed in recent years as well. Large-scale beef operations commonly use corn feed in place of grass feed and commodity crop farms use non-sustainable methods in their processes. These methods are changing the biochemistry of the food we eat. These trends are proof that our community is eating differently today than we did several years ago, and this change in eating behaviors is associated with poor health outcomes. In short, we are getting sicker from our current food environment.



Berrien County Demographics At A Glance

population

(1) **154,636**

(2) **67% urban**
33% rural

mean age

(3) **42 years**

(3) education distribution

88.3%
over 25 years old
complete high
school

24.8%
have a bachelor's
degree

(3) average household income

\$37,095

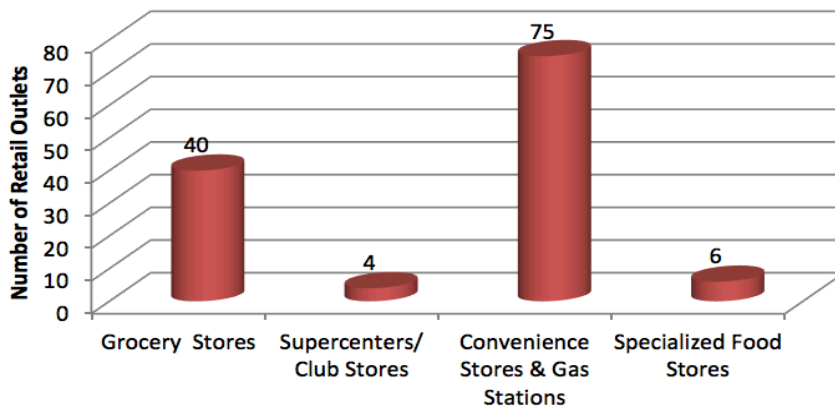
(1) race distribution

79.6%
white

15.4%
african
american

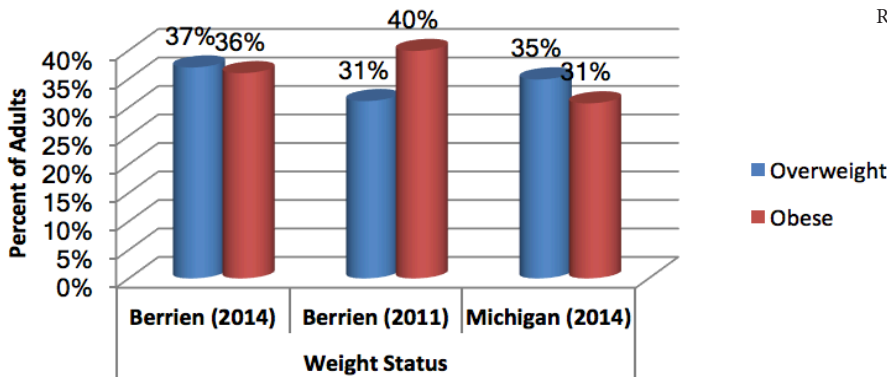
5.3%
hispanic/
latinos

Number and Type of Food Retailers



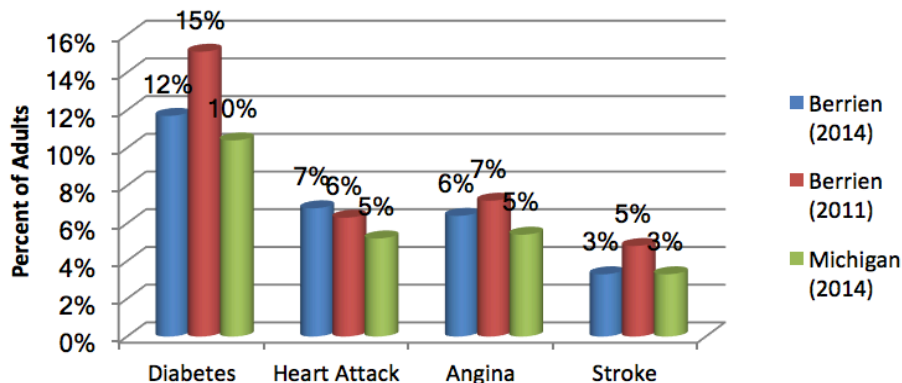
Source: 2012 USDA Economic Research Service (ERS)

Weight Status



Source: Berrien County Behavior Risk Factor Survey, 2014

Health Risks



Source: Berrien County Behavior Risk Factor Survey, 2014

(1) Source: US Census Bureau, Population Estimates Program (PEP), 2015 Population Estimates
 (2) Source: www.citydata.com
 (3) Source: US Census Bureau, United States Department of Commerce, 2016, Quick Facts Michigan

A Changing Paradigm

Life expectancy in the past century has seen a significant increase due largely to social reforms, labor laws, sanitation and minimum wage laws. The most common causes of death have shifted from away from acute illnesses to chronic disease, in particular, diabetes, heart disease and cancer. This shift has changed the way population health must be addressed, with a stronger need to focus on preventive measures in community infrastructure. Addressing widespread chronic disease in communities is a strenuous process. Many past health promotion models have focused on education as the best way to change health practices. However, education does not address social, environmental, political or other factors that play a large role influencing behaviors.

In 2010, Be Healthy Berrien was formed as a community-wide initiative to address these kinds of issues, which have lead to the high rates of obesity and chronic disease we see today. With a focus on policy, system, and environmental changes, Be Healthy Berrien is focusing on creating a community where healthy choices become easier in the places we live, work, learn, and play. Be Healthy Berrien aims to make equitable improvements for all in order to decrease the rates of chronic disease from unhealthy behaviors. The Be Healthy Berrien Steering Committee Partners, including Berrien County Health Department, Lakeland Health, Southwest Michigan Planning Commission, United Way of Southwest Michigan, and Niles-Buchanan/Benton Harbor-St. Joseph YMCA, are actively engaged in leading coordinated health improvement efforts in the community and within their own organizations.



United Way
of Southwest Michigan



BENTON HARBOR-ST. JOSEPH



NILES - BUCHANAN

The Issue of Access

Our research has found that in Berrien County people with lower incomes and lower educational attainment are eating the fewest servings of fruits and vegetables, and are also disproportionately impacted by adverse health outcomes. These people also most often live in areas with limited access to healthy foods. Access to food is multi-layered, and includes factors such as:

Proximity the distance to a store that sells healthy food

Financial the means to afford to purchase healthy food

Acceptability the willingness to eat healthy foods (based on taste, appearance, etc.)

Culinary Knowledge the skills and knowledge to prepare, cook, and store healthy food

The US Department of Agriculture has defined “food deserts” as parts of the country void of fresh fruit, vegetables, and other healthy whole foods, usually found in impoverished areas. This is largely due to a lack of grocery stores, farmers’ markets, and healthy food providers. Unfortunately, there are several food deserts within Berrien County.

These are the inequities and areas where many food-related interventions are focused in order to create change.

“It is unreasonable to expect that people will change their behavior easily when so many forces in the social, cultural, and physical environment conspire against such change.”
- Institute of Medicine, 2001

Food Deserts (USDA original definition)

Municipality	Census Tract	Population	Population Below Poverty	Households receiving SNAP	Median Income	Households with No Vehicle Access
Benton Harbor	26021000400	2152	58.1%	707	\$14,460	415
Benton Harbor	26021000300	2270	42.1%	448	\$20,349	228
Benton Harbor	26021002200	2904	54.8%	670	\$15,877	452
Berrien Springs	26021021300	5601	21.4%	94	\$45,750	101
Buchanan	26021020200	5469	18.5%	282	\$45,507	358
Niles City	26021020900	4064	24.5%	359	\$33,109	152
Niles Township	26021021200	1464	21.6%	102	\$36,827	52

Source: US Census Bureau, 2010-2014 American Community Survey 5-Year Estimate

(1) **38,516** people with low access to stores for food

(1) **13,165** people with both low income and low access to stores that sell healthy food

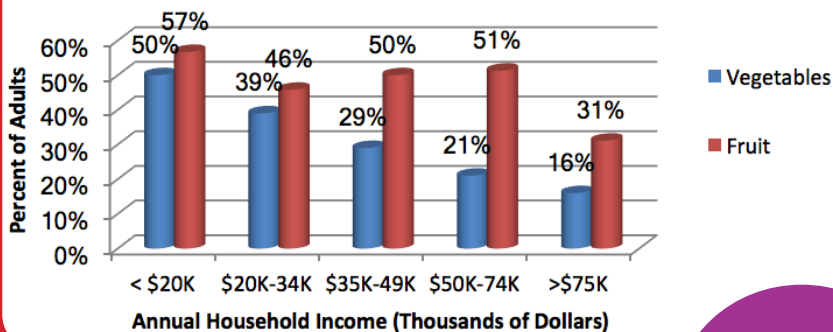
(1) **1,906** households with no car and low access to stores for food

(2) **24,741** Berrien County residents with USDA-defined low vehicle access

roughly 15% of Berrien County's population

(1) Source: USDA Economic Research Service (ERS) current version data, last updated 8/9/15
(2) Source: US Census Bureau, 2010-2014 American Community Survey 5-Year Estimate

Household Income and <1 time fruit or vegetables eaten per day



Source: Berrien County 2014 BRFS

An Agricultural Community

Berrien County has a legacy as an agricultural center. Berrien County agriculture is ranked second in the nation for the diversity of agricultural products grown. With access to 20% of the world's fresh water supply and proximity to major markets such as Chicago, this has been an ideal location for both large and small farms alike. The Benton Harbor Fruit Market is the oldest commodity market in Michigan, established in 1860. Berrien County is also home to the oldest and largest multi-community festival in the state of Michigan – the Blossomtime Festival. This celebration began in 1906 as a celebration of the coming of fruit blossoms and the celebration of Berrien County as a premier fruit growing region.

If good food is necessary for good health, the bounty of produce grown in Berrien County should be a major contributor to addressing the challenges associated with diet-related diseases that we are facing today.

Berrien County Ranking for the State of Michigan

Total value of crops **15th**

Total value sold in vegetables, melons, potatoes, sweet potatoes **2nd**

Total value sold in fruits, tree nuts, berries **4th**

Acres of vegetables harvested **5th**

Acres of grapes **1st**

Source: USDA Census of Agriculture 2012

Commercial Food Processing in Berrien County

- 49** wholesale food processing plants
- 39** meat processing plants (MDARD licensed)
- 24** food warehouses
- 3** controlled atmosphere storage facilities
- 1** dairy processing plant
- 1** dairy warehouse, transfer, and truck cleaning facilities
- 1** slaughter facilities (MDARD licensed)

Source: 2014 Michigan Food and Agriculture Systems Report

1,063 farms in Berrien County

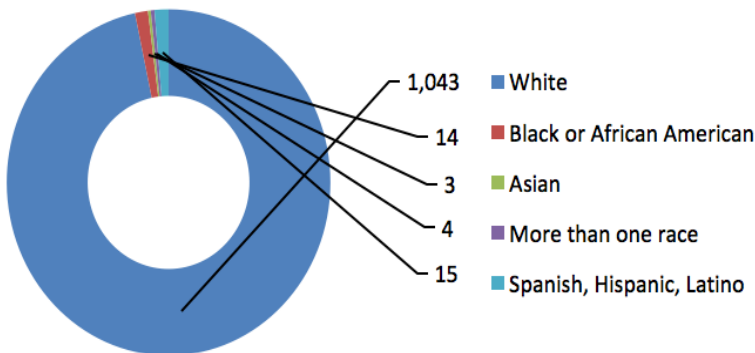
46% of land in Berrien County is used by farms

52,194 farms in Michigan

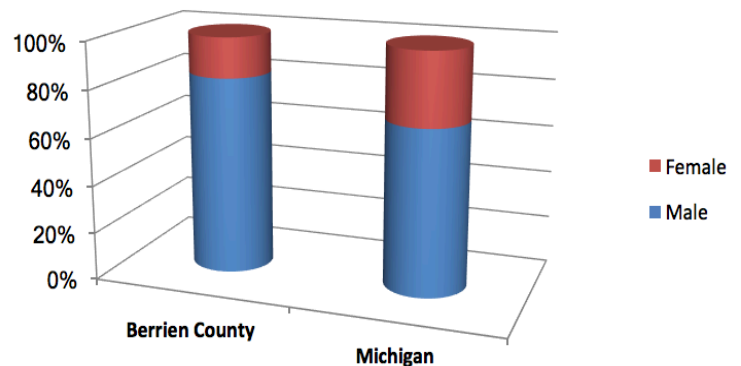
10.5% of land in Michigan is used as farms

Source: USDA Census of Agriculture 2012

Farmer Race



Farmer Gender



Source: USDA Census of Agriculture 2012

Farmers in Berrien County are demographically similar to farmers across the state of Michigan. The majority of farmers are white males. The average age of farmers has continued to rise along with the national trends. 85% of farms in Berrien County are family- & individual-owned. These characteristics demonstrate an established agricultural industry. However, emphasis must be placed on increasing the number of new, younger, and more diverse farmers in order to ensure endurance of agriculture into the future.

Our Current Projects

Many community organizations, partners, and growers have begun efforts that move beyond an education/motivation approach. Some efforts are aiming to improve the food environment and to increase access to healthy foods in the communities that need it most.

Be Healthy Berrien has committed to increasing access to healthy foods as one of their main priority areas. Be Healthy Berrien helped launch and continues to support Andrews University and their Mobile Farmers Market. Its mission is to create sustainable changes that break barriers in food deserts through partnerships with farms and community.

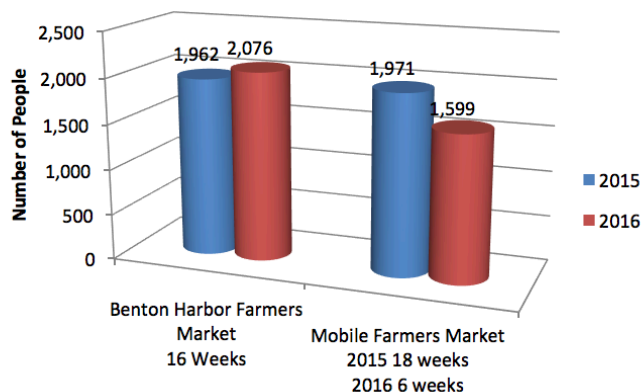
The Berrien County Health Department leads and participates in a variety of community health initiatives that focus on public health inequities and health issues. Their community health initiatives take a prevention-driven approach to health, promote healthy eating, active living, the reduction of health inequalities, and strong families. Each summer, the Berrien County Health Department hosts the Benton Harbor Farmers Market in order to bring fresh local produce to the city of Benton Harbor.

Lakeland Health has offered Healthy Cooking classes and screenings as part of their Community Health and Wellness programs. Their recent Community Health Needs Assessment has strengthened the community's understanding of the food-related challenges within the community and they are actively working towards creating an implementation strategy to address these challenges.

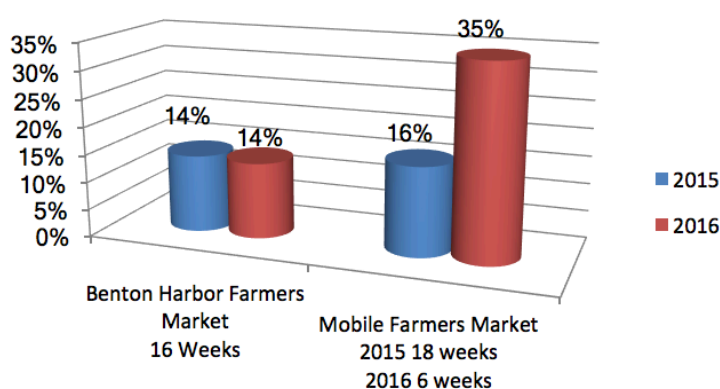
Local growers are also playing a key role in improving access to healthy foods. Direct sales of produce and other farm products through Farmers Markets, Farm Stands, and Community Supported Agriculture (CSA) programs contribute to the number of locations selling healthy food and also connect growers to their communities.



Attendance



Percent of Revenue from EBT



Sources: Berrien County Health Department 2016 Benton Harbor Farmers Market Operations Report, Andrews University 2016 Mobile Farmers Market Operations Report

1,063
farms in Berrien County

7
farmers markets

15
CSA

14
farm stands

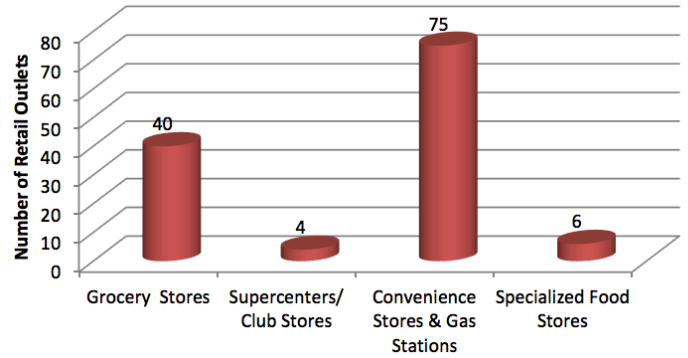
More Room to Grow

Although the current efforts are reaching small targeted areas, they are unfortunately not having a big enough impact to improve the health of the entire population. The current efforts have also occurred largely independently from each other, without coordination between organizations. These efforts have also not targeted the food retail environment. With more convenience stores than grocery stores in this community, there are many more opportunities to purchase unhealthy, convenience foods and fewer opportunities to purchase healthy, fresh foods.

Also, the high risk of small farming remains a major barrier for local growers of specialty crops to participate in improving the food landscape. Small farmers have been fundamentally unable to compete with larger, commodity farms due to the ineligibility of small farmers to participate in the governmental subsidies support system that larger farms use to mitigate against their risks.

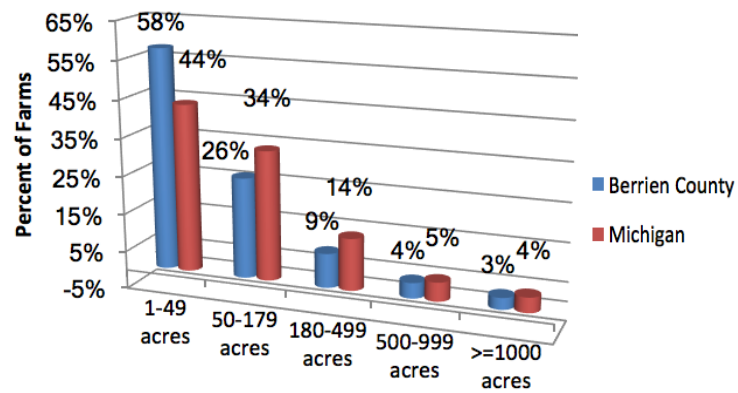
Finally, food insecurity continues to be a major challenge, affecting many households in the community. Food insecurity refers to the inability to afford nutritionally adequate and safe foods. Households often respond to food insecurity by making food budget adjustments, reducing food intake, changing the types of food served, and utilizing food assistance resources. The variety of food consumed in food-insecure households decreases, and consumption of higher-calorie foods with poor nutritional quality increases. Food assistance resources such as food banks and food pantries work to fulfill nutritional needs of those they serve as much as possible. However, these resources are often limited in the foods they are able to provide, and may offer more high-calorie processed foods and fewer options of protein, dairy, and produce. The NHANES study found that U.S. adults in food-insecure households eat fewer weekly servings of fruits, vegetables, and dairy and lower levels of micronutrients, including the B complex vitamins, magnesium, iron, zinc, and calcium. These dietary patterns are linked to the development of chronic disease, including hypertension, hyperlipidemia, and diabetes.

Food and Type of Food Retailers



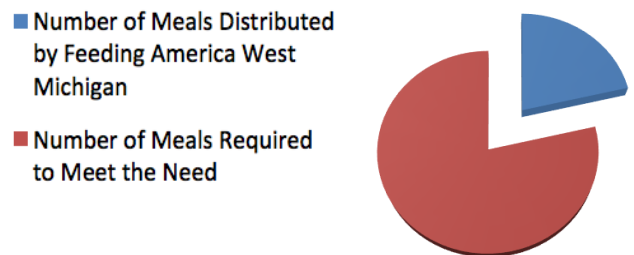
Source: USDA Census of Agriculture 2012

Farm Size



Source: USDA Census of Agriculture 2012

The Meal Gap



Source: Feeding America of West Michigan, Map the Meal Gap 2014

percentage of population that encountered food insecurity in **BERRIEN COUNTY** **15.3%** (1)

percentage of population that encountered food insecurity in the state of **MICHIGAN** **14.7%** (2)

number of **BERRIEN COUNTY** food banks, pantries, soup kitchens, meals on wheels **79** (3)

(1) Source: Feeding America of West Michigan, Map the Meal Gap 2014

(2) Source: USDA Economic Research Service (ERS) current version data, last updated 8/9/15

(3) Source: 2014 Michigan Food and Agriculture Systems Profiles

Missed Opportunities

If the focus remains on education and programmatic solutions alone to address poor nutrition, the rates of diet-related diseases will not significantly change. While classes and individual education sessions are important in addressing gaps in knowledge, they don't address the social, environmental, political or other factors that play a large role influencing behaviors.

Farmers Age		
age	Michigan	Berrien County
65 years and over	20,848	407
55-64 years	22,120	290
45-54 years	19,524	237
35-44 years	9,993	99
25-34 years	5,193	28
under 25 years	1,270	2
<i>average age</i>	55.5	60.7
Source: USDA Census of Agriculture 2012		

Also, the average Michigan farmer is approaching retirement. The process of mentoring and training the next generation of farmers has diminished in recent years, and fewer young people are considering agriculture as a career-choice. Because of the high risk and limited support services for small operations, farming is not seen as a viable option for younger entrepreneurs. Without motivated young farmers, there will be fewer growers and even less local food will be available in the food system.

Food waste also plays a major role in the food system and food access issues. Up to 40 percent of the good, safe food produced in America never makes it to people's plates. 33 billion pounds of food was lost in 2010. This represents 31 percent of the total food supply with a value of about \$161.6 billion. These losses take needed food out of the food system, reducing availability for community members, and reducing profit for growers, food distributors, and food retailers.

In order to make an impact large enough to improve the health of the population, a community-based coordinated approach to addressing access issues and challenges within the food system is necessary. Lakeland Health and Be Healthy Berrien have gained important insight from community members through Lakeland Health's Community Health Needs Assessment and Be Healthy Berrien's Community Conversations. The community-knowledge gained from these focus groups, interviews, and surveys will help guide future efforts to improve the food environment and move beyond educational programs.

What makes it hard to be healthy?

- 56.2%** identified proximity to healthy foods
- 36.6%** identified cost as a barrier
- 23.2%** identified acceptability of healthy foods
- 13.4%** identified culinary ability



How Can We Fill The Gap?

Although we grow an abundance of food, there is a huge gap in getting this food to the people who need it. More effort is needed to address needs and improve social, environmental, and political, factors in addition to focusing on educational solutions.

1,063 ⁽¹⁾

farms

156,418 ⁽¹⁾

acres of farmland

5th ⁽²⁾

in the State of Michigan for
acres of vegetables harvested

7 ⁽³⁾

food deserts

38,516 ⁽³⁾

population living in food
deserts

32.4% ⁽⁴⁾

percentage of people who eat
vegetables less than one time
per day

(1) Source: Michigan Food and Agriculture Systems Profiles, 2014

(2) Source: USDA Census of Agriculture 2012

(3) Source: US Census Bureau, 2010-2014 American Community Survey
5-Year Estimate

(4) Source: Berrien County 2014 BRFS



A New Model For Change

This assessment has identified the need for a systematic approach for growers, retailers, health professionals, and other community stakeholders to work together to address farming challenges and solve health problems from poor nutrition. Be Healthy Berrien and Berrien County Health Department have developed the following recommendations for addressing issues identified in this report:

- Establish a Local Food Council as a way to collaborate and implement solutions
- Create opportunities to connect local food to local tables through profitable and equitable practices
- Build a strong support system for local farms, including supporting small growers of specialty crops, through equipment sharing, sharing processing facilities, group GAP certification, and connecting local farmers to additional state and federal resources
- Include information on healthy food affordability and food as medicine in multiple existing education initiatives as a way for health professionals to deliver a coordinated message and increase consumer demand for locally grown, healthy foods.
- Develop programs to educate and empower farmers and consumers on using “seconds” or otherwise good, discarded foods to address food insecurity and low food access in the community.
- Gather additional data related to consumption trends and agricultural export trends

“A simple (and yet somehow complicated) solution would be a local licensed kitchen that takes in (buys for reasonable wholesale seconds cost) all the leftovers, etc. and processes those into soups and other ready to consume items that could then be sold at an again reasonable retail price to local consumers. Anything not considered fit for human consumption should ideally go to meat, milk or egg producing animals such as pigs, goats, chickens, etc. where the “waste” is turned very effectively into other edible products by those animals.”

*Karen Warner, Owner/Operator (Big Head Farms)
Benton Harbor, MI*

Yes! We can solve the challenge of nutrition-related chronic disease by connecting the food system to those who need food in profitable and equitable way.

The, “Eat Fresh and Grow Jobs” study showed that robust efforts to increase sales of fresh, local foods in Michigan could significantly improve Michigan’s economy by boosting employment and personal income of agricultural workers. Using an economic modeling tool customized to Michigan, the study determined that doubling or tripling the amount of fruits and vegetables that Michigan farmers sell into fresh produce markets could increase net farm income in Michigan by \$164 million, or nearly 16 percent. As farm families spend this new income, the study showed they could generate up to 1,889 new jobs across the state.

Establishing an effective food system that provides people with the **PROPER AND NECESSARY NUTRITION TO FIGHT CHRONIC DISEASE IS THE MOST ECONOMICAL AND ASSURED METHOD OF PREVENTATIVE TREATMENT SCIENCE CAN PROVIDE.** The solution to chronic disease will not be found in a vaccination or a pill, but in the day to day habits of consumers. Proactively creating a food landscape that makes it easier for consumers in our community to regularly select healthy foods will help move the needle on reducing diet-related chronic diseases, reducing healthcare costs, in creating a healthy, sustainable community.

Appendix I

Additional Data & Source List

Food access in this report is discussed using store availability, store adequacy, community perceptions, and USDA-defined food deserts. While these numbers may be important individually, they must be examined together as they relate to one another.

Glossary

The terms utilized in this appendix come from the United States Department of Agriculture (USDA).

- **Convenience store** (Merriam-Webster definition): Store that is open for longer than usual business hours with a select stock of grocery items.
Examples: gas stations, corner stores.
- **Food Insecurity**: USDA's measure of lack of access, at times, to enough food for an active, healthy life for all household members and limited or uncertain availability of nutritionally adequate foods.
- **Large Grocery store (supermarket)**: \$2 million in annual sales and sold fresh produce, fresh meat/poultry, dairy, dry and packaged foods, and frozen foods.
Examples: Walmart and Meijer
- **Low-access (LA)**: The tract has at least 33% of its population or at least 500 people that meet the USDA original food desert measure.
- **Low-income (LI)**: The tract has a poverty rate is 20% or greater, or the median family income is 80% or less than the state median family income, or the tract is in a metropolitan area and has a median family income of 80% or less than the entire metropolitan area's median family income.
- **Low-vehicle access**: The tract has at least 100 households more than ½ mile from the nearest supermarket and have no vehicle, or at least 33% (or 500 people) of the tract live more than 20 miles from the nearest supermarket.
- **Original USDA food desert**: An area qualifies if the nearest supermarket (supermarket, supercenter, or large grocery store) is at least 1 mile away for urban areas or at least 10 miles away for rural areas.
- **Supercenter/Club store** (Merriam-Webster definition): A very large discount department store that also sells all food departments seen in a large grocery store.
Examples: Sam's Club and Costco

Food Access

Table 1 - Store Availability

Question	Data						Source	
<i>What kinds of stores are located in Berrien County?</i>	Grocery Stores	Supercenters /Club Stores	Convenience Stores	Specialized Food Stores	SNAP-authorized stores	WIC-authorized stores	2012 USDA Economic Research Service (ERS) current version data, last updated 8/9/15	
	40	4	75	6	135.83	33		
Data Limitations: Store counts are just one piece of the puzzle. This section does not assess the quality or affordability of these foods (discussed in another section). The counts are not relatable to other counties due to different population sizes, this is why rates are used in the store availability section. This data also does not provide specific SNAP and WIC counts for each store type.								
<i>Is the number of stores adequate to serve the population?</i>		Grocery Stores per 1000	Supercenters / Club Stores per 1000 pop.	Convenience Stores per 1000 pop.	Specialized Food Stores	SNAP-authorized stores	WIC-authorized stores	2010 and 2012 USDA Economic Research Service (ERS) current version data, last updated 8/9/15.
	Berrien	0.26	0.03	0.48	0.04	0.87	0.21	
	Muskegon	0.13	0.04	0.39	0.07	0.93	0.22	
	Calhoun	0.18	0.03	0.58	0.04	1.18	0.22	
	Kalamazoo	0.18	0.03	0.33	0.07	0.74	0.17	
	Jackson	0.12	0.02	0.47	0.06	0.86	0.19	
	Genesee	0.21	0.03	0.47	0.05	1.11	0.23	
Data Limitations: Data limitations: Although the only information available, it is indeed possible all of these counties are suffering from the same issues. If so, the problems will be masked by this sort of comparison. It is best to not only compare counties, but to acknowledge that as a whole these counties have significant proportions of their populations in need (such as roughly a quarter of each county's population being defined as having low access).								
<i>Is there an appropriate mix of stores?</i>	There are no USDA-defined appropriate proportions for store types. Survey respondents reported health food store/co-ops, warehouse club stores, and small family-owned grocery stores as missing from their communities.						Be Healthy Berrien 2016 Purchaser Perception Survey	
Data Limitation: This survey question does not directly address the question we are aiming to answer. In this survey, it is unable to be identified whether respondents actually desire these store types in their communities. However, it does allow us to figure out what types in lacking in which communities. Survey sampling methods may not be representative of Berrien County as a whole, either.								
<i>Where are the food deserts?</i>	Municipality	Census Tract	Population	Population Below Poverty	Households receiving SNAP	Median Income	US Census Bureau, 2010-2014 American Community Survey 5-Year Estimates	
	Benton Harbor	26021000400	2152	58.1%	707	\$14,460		
	Benton Harbor	26021000300	2270	42.1%	448	\$20,349		
	Benton Harbor	26021002200	2904	54.8%	670	\$15,877		
	Berrien Springs	26021021300	5601	21.4%	94	\$45,750		
	Buchanan	26021020200	5469	18.5%	282	\$45,507		
	Niles City	26021020900	4064	24.5%	359	\$33,109		
	Niles Township	26021021200	1464	21.6%	102	\$36,827		
Data Limitations: The American Community Survey is not always the most accurate at such a fine level of geographic interpretation and these numbers should be applied cautiously.								

Store Availability Interpretation:

The first part of food access is determining what Berrien county already has to offer. The store counts are further elaborated with comparisons to demographically similar counties. Given the lack of an overall store-to-population standard by the USDA, demographically similar counties were compared to see where Berrien stands amongst them Percentages of people/households experiencing low access is a great indicator of whether the number or placement of these stores are sufficient. After putting all of the pieces together (store counts and rates, and comparing Berrien to similar counties) the big question is whether or not the current situation in Berrien is acceptable. Counts and rates mean nothing without context, and that is what this table provides. Although Berrien ranks similarly with its fellow counties and does not seem to have any noticeable deficits in this regard, the seven food deserts represent the several thousands of individuals who are in dire need of help. If these individuals were asked, they would most likely say the stores are not nearby or adequate.

Table 2 - Store Adequacy

Question	Data	Source	
Do the stores sell a wide variety of high quality, healthy food at affordable prices?	It is easy to find fresh fruits/vegetables in my neighborhood	75.0% agree	2016 Be Healthy Berrien Purchaser Perceptions Survey
	There is a wide variety of healthy foods in my neighborhood	69.61% agree	
	There are high quality healthy foods in my neighborhood	61.17% agree	
Do the stores sell culturally appropriate food?	78.21% agree	2016 Be Healthy Berrien Purchaser Perceptions Survey	
Are residents comfortable shopping in the stores	88.0% agree	2016 Be Healthy Berrien Purchaser Perceptions Survey	
Do stores accept SNAP, WIC, and other Food Assistance?	SNAP-authorized stores	135.83	2012 USDA Economic Research Service (ERS) current version data, last updated 8/9/15
	WIC Authorized stores	33	
<p>Data Limitations: The surveys were offered to everyone in the area at selected sampling sites who desired to fill them out (convenience sampling), but only some individuals, most likely those more involved in their community or passionate about food/health, filled out their survey. This survey is most likely not representative of the entire population for which we are aiming to draw conclusions, but rather only the group that was surveyed. The survey does not specify which stores consumers were agreeing or disagreeing with on these measures.</p>			

Store Adequacy Interpretation:

Most of these questions are largely subjective in nature. Additional data collection to determine food inventory at specific stores would provide an objective measure of healthy food availability, cost, and cultural appropriateness.

Table 3 - Sociodemographic

Question	Data	Source		
Do the residents have the resources they need to access the available food?	Measure	Population	1- USDA Economic Research Service (ERS) current version data last updated 8/9/15 2- Michigan Food and Agriculture Systems Profiles 2014	
	Low access to stores for food ¹	38,516		
	Low income and low access to stores for food ¹	13,165		
	No car and low access to stores for food ¹	1,906 (Households)		
	Students eligible Free/reduced lunch ²	14,377		
What is the level of food insecurity?	Number of Food Insecure People	Food Insecurity Rate	1 Feeding America West Michigan	
	Berrien County ¹	23,790	15.30%	2 - USDA Economic Research Service (ERS) current version data last updated 8/9/15
	Michigan ²	NA	8.4%	

What is the level of car ownership?	Percent of Households with No Vehicle¹		1- American Community Survey 5-Year Estimates 2009-2013 2- USDA ERS Food Access Research Atlas
	Berrien County	8.4%	
	Michigan	7.8%	
	United States	9.1%	
	Berrien County census tracts with USDA-defined low vehicle access²		
	Census Tract	Population	
	26021002500	2264	
	26021002200	2682	
	26021000500	1896	
	26021000400	2141	
	26021000800	5312	
	26021020200	5305	
	26021021000	5150	
	*These census tracts account for roughly 15% of Berrien County's population.		
Data Limitations: Low personal-vehicle access may or may not directly relate to food access for some individuals (such as those that use public transport in the city)			

Demographic Interpretation:

Food insecurity refers to USDA's measure of lack of access, at times, to enough food for an active, healthy life for all household members and limited or uncertain availability of nutritionally adequate foods.

Table 4 - Shopping Patterns

Question	Data	Source	
Where are residents shopping?	Those who often or always shop at the following types of stores		2016 Be Healthy Berrien Purchaser Perceptions Survey
	Supermarkets	84.69%	
	Small Grocery Stores	26.32%	
	Dollar Stores	21.67%	
	Health Food Stores	16.84%	
	Convenience Stores	16.84%	
	Drug Stores	15.79%	
	Food Pantries/Food Banks, Soup Kitchens	10.53%	
	Warehouse Club Stores	8.52%	
	Data Limitations: The surveys were offered to everyone in the area at selected sampling sites who desired to fill them out (convenience sampling), but only some individuals, most likely those more involved in their community or passionate about food/health, filled out their survey. This survey is most likely not representative of the entire population for which we are aiming to draw conclusions, but rather only the group that was surveyed. The survey does not specify which stores consumers were agreeing or disagreeing with on these measures.		

Shopping Patterns Interpretation:

Additional data collection is needed to fully understand shopping patterns of Berrien County Residents. Additional questions include (1) how often are residents shopping, and (2) what are residents purchasing. These questions could be assessed using customer-intercept surveys, grocery receipt analysis, and/or food retailer sales data.

Table 5 - Health Outcomes & Dietary Behavior

Question	Data	Source			
What are residents eating?	BRFS Health Behaviors – Fruit and Vegetable Consumption 2014			2014 Berrien County BRFS	
		Fruit <1 Time/Day	Vegetables <1 Time/Day		
	Berrien	45.3%	32.4%		
	Michigan	37.3%	24.8%		
	Male (Berrien)	50.7%	34.9%		
	Female (Berrien)	40.6%	30.3%		
	White (Berrien)	41.9%	27.6%		
	Black (Berrien)	64.2%	59.4%		
Data Limitations: The only available consumption measures are fruit and vegetable consumption. These measures gathered by the BRFS are only part of the question. Fruit and vegetable consumption is not enough, larger assessments must examine eating habits and nutritional knowledge.					
What are obesity rates?				2014 Berrien County BRFS	
		Berrien (2014)	Berrien (2011)		Michigan (2014)
	Overweight	35.0%	31.1%		34.9%
	Obese	37.1%	39.9%		30.7%
What are diet-related disease rates?				2014 Berrien County BRFS	
		Berrien (2014)	Berrien (2011)		Michigan (2014)
	Diabetes (18+ yrs)	12.9%	15.1%		10.4%
	Heart attack (35+ yrs)	8.0%	6.3%		5.2%
	Angina (35+ yrs)	7.6%	7.2%		5.4%
	Stroke (35+ yrs)	3.2%	4.8%		3.3%

<i>What is the level of health disparities?</i>	<p>Potential disparities:</p> <p>Men (42.2%, 95% CI: 37.5-46.8%) reported being overweight more than women (29.0%, 95% CI: 25.1-32.8%)</p> <p>35-44 year olds (14.2%, 95% CI: 8.4-20.0%) reported being not overweight or obese less than other age groups.</p> <p>Those with less education than a high school diploma (27.3%, 95% CI: 18.5-36.1%) reported being told they have diabetes more than those with more educational attainment.</p> <p>Those whose household income is over \$75000 (4.6%, 95% CI: 1.3-7.9%) reported being told they have diabetes less than other income groups.</p>	2014 Berrien County BRFS
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Food System

Table 6 - Production

Question	Data	Source																																																																		
<p><i>How many farms are there?</i></p> <p><i>How much land is used as farmland?</i></p>	<table border="1"> <thead> <tr> <th></th> <th>Number of Farms</th> <th>% of Land used as Farms</th> </tr> </thead> <tbody> <tr> <td>Berrien County</td> <td>1,063</td> <td>46% used as farms</td> </tr> <tr> <td>Michigan</td> <td>52,194</td> <td>10.5% used as farms</td> </tr> </tbody> </table>		Number of Farms	% of Land used as Farms	Berrien County	1,063	46% used as farms	Michigan	52,194	10.5% used as farms	<p>USDA Census of agriculture 2012 https://www.agcensus.usda.gov/Publications/2012/</p>																																																									
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Food Collaborative Efforts	<p>Emerald Avenue¹- A collection of family-owned farms, wineries and small businesses based in Southwest Michigan. The collection has declared the following Manifesto:</p> <ul style="list-style-type: none"> • Strive to deliver the highest-quality foods, beverages, products and experiences possible. • Help build a stronger economy in Southwest Michigan that enriches families and communities. • Uphold the responsibilities passed down to us as caretakers of this gorgeous natural environment. • Embrace our shared history, while maintaining the rich family histories that make each of our businesses unique and amazing. • Never stop striving to make your visitors' here absolutely unforgettable. <p>Lake Michigan Shore Wine Trail² – A collection of 20 wineries and 9 tasting rooms in Southwest Michigan. The Lake Michigan Shore Wine Trail mission is to help wine lovers everywhere discover and enjoy the vintages of the Lake Michigan Shore American Viticultural Area.</p> <p>Southwest Michigan Local Food Council³ – Be Healthy Berrien is in the process of establishing this council in 2017. The Southwest Michigan Local Food Council will be a coalition of diverse partners and stakeholders working to improve the food environment in Berrien County.</p>	<p>1 – http://theemeraldavenue.com/</p> <p>2 – http://miwinetrail.com/</p> <p>3 - Heather Cole, Be Healthy Berrien Director</p>																																																												

Table 7 - Processing and Wholesale

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Table 8 - Distribution

Question	Data	Source																												
What Food Retail establishments are located in Berrien County?	<table border="1"> <thead> <tr> <th></th> <th>Number</th> <th>Percent</th> <th>Number of employees</th> </tr> </thead> <tbody> <tr> <td>Supermarkets & grocery stores</td> <td>88</td> <td>50.9%</td> <td>1520</td> </tr> <tr> <td>convenience stores and gas stations</td> <td>71</td> <td>41.0%</td> <td>NA</td> </tr> <tr> <td>specialty markets and specialty stores</td> <td>14</td> <td>8.1%</td> <td>NA</td> </tr> </tbody> </table>		Number	Percent	Number of employees	Supermarkets & grocery stores	88	50.9%	1520	convenience stores and gas stations	71	41.0%	NA	specialty markets and specialty stores	14	8.1%	NA	US Census Bureau 2014 County Business Patterns												
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What Direct Market Retail establishments are located in Berrien County?	<table border="1"> <thead> <tr> <th>Type</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Farmers Markets</td> <td>7</td> </tr> <tr> <td>Farm Stands</td> <td>22</td> </tr> <tr> <td>CSA</td> <td>15</td> </tr> </tbody> </table>	Type	Number	Farmers Markets	7	Farm Stands	22	CSA	15	Michigan Food and Agriculture Systems Profiles 2014																				
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What institutions are serving food in Berrien County?	<table border="1"> <thead> <tr> <th>Type</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Government Programs (schools, prison)</td> <td>92 k-12 entities¹ 1 jail²</td> </tr> <tr> <td>Private Sector Program (Hospital, senior citizen facility)</td> <td>121 facilities³</td> </tr> <tr> <td>Colleges/universities</td> <td>3 facilities with food services⁴</td> </tr> </tbody> </table>	Type	Number	Government Programs (schools, prison)	92 k-12 entities ¹ 1 jail ²	Private Sector Program (Hospital, senior citizen facility)	121 facilities ³	Colleges/universities	3 facilities with food services ⁴	1- MI School Data https://www.mischooldata.org/ 2- http://www.bcsheriff.org 3- 2014 County Business Patterns 4- Berrien RESA																				
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Table 9 - Food Loss/Waste

Question	Data	Source																		
How much food is wasted annually nationwide? What is the value	33 billion pounds of food was lost in 2010. This represents 31 percent of the total food supply with a value of about \$161.6 billion.	http://msue.anr.msu.edu/news/wasted_food_has_multiple_consequences_for_people_and_the_planet USDA's Economic Research Service MSU – Extension																		
Where does food loss occur?	<table border="1"> <thead> <tr> <th>Phase</th> <th>Loss type</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>Phase 1</td> <td>Losses during production and harvest</td> <td>mechanical or pest, weather damage</td> </tr> <tr> <td>Phase 2</td> <td>Postharvest, handling and storage losses.</td> <td>Perished foods</td> </tr> <tr> <td>Phase 3</td> <td>Losses during packaging and processing.</td> <td>peelings, bones, egg shells</td> </tr> <tr> <td>Phase 4</td> <td>Distribution and retail losses</td> <td>Perished Food not sold in a timely fashion</td> </tr> <tr> <td>Phase 5</td> <td>Consumer losses including restaurant foods</td> <td>Uneaten foods. By far, the largest percentage of loss occurs here</td> </tr> </tbody> </table>	Phase	Loss type	Example	Phase 1	Losses during production and harvest	mechanical or pest, weather damage	Phase 2	Postharvest, handling and storage losses.	Perished foods	Phase 3	Losses during packaging and processing.	peelings, bones, egg shells	Phase 4	Distribution and retail losses	Perished Food not sold in a timely fashion	Phase 5	Consumer losses including restaurant foods	Uneaten foods. By far, the largest percentage of loss occurs here	http://msue.anr.msu.edu/news/buying_local_reduces_food_waste_which_is_recyclable_as_compost_for_your_gar
Phase	Loss type	Example																		
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What happens to the unsold produce from Farmers Markets?	Some types of foods can be brought back to the farm to hold for sale, such as winter squash, storage onions, garlic, potatoes, etc. but other items like leafy greens will not usually survive going to market and coming home for another round. Those either go to animal fodder or to local food banks that pick up at the end of the market.	Karen Warner–Owner/Operator Big Head Farm																		

Acknowledgements

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Berrien County Health Department
Lakeland Health
Southwest Michigan Planning Commission
United Way of Southwest Michigan
Benton Harbor-St. Joseph YMCA
Niles-Buchanan YMCA

Created in 2017

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