

# Food Access Gaps in Rural Ohio

*Center for Farmland Policy Innovation  
Department of Agricultural, Environmental and  
Development Economics*

*Research Brief #2010-5  
May 24, 2010*

Francis Muamba, Jill K. Clark and Nathaniel Betz



COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES  
OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER  
OHIO STATE UNIVERSITY EXTENSION

## *Report Highlights*

This report presents the results of a rural Ohio food access gap analysis. The full report can be found at the following web page: <http://cffpi.osu.edu/fooddeserts.htm>. Three broad aspects of retail grocery store accessibility are considered in this research brief – physical accessibility, economic accessibility, and healthy accessibility.

### Physical Accessibility

- 24% of rural Ohio households live outside of a 10-minute drive to a retail grocery store of any size.
- For those rural Ohio households living within a 10-minute drive, 3.8% do not own a vehicle.
- 75% of rural Ohio households live outside of a 1-mile walk of a retail grocery store of any size.
- Public transportation in rural Ohio is not as pervasive as in urban areas, making it difficult for those households with limited or no access to a vehicle to shop at a retail grocery store.

### **Center for Farmland Policy Innovation**

The Center, established in 2006, resides at Ohio State University, and is associated with the OSU Extension Services. Our mission is to enable communities to achieve farmland protection policy priorities by partnering on innovative projects and providing needed programming. We work to spread local seeds of invention. Further, we work at the state and federal levels to encourage viable local agricultural environments.

### Economic Accessibility

- Rural Ohio households living outside of a 10-minute drive to a retail grocery store have lower incomes than those living within a 10-minute drive.
  - The median yearly per capita income of households living outside a 10-minute drive is \$22,371, while those that live within this driving distance have a median household income of \$23,105.
  - 9.7% of households living outside the 10-minute drive have household incomes below \$10,000 per year, while the percentage is a little less inside this driving distance at 9.7%.
- Only 29.5% of rural households (583,271 households) live in areas where there is some competition between large supermarkets, which can keep food prices lower.
- Of the 71.5% of households living outside areas of competition, 268,333 rural households live within a 10-minute drive of a large supermarket, but there may be higher prices as a result of no competition.
  - 6.3% of these 268,333 households (or 16,786 households) don't have cars to drive to a more competitive large retail supermarkets zone.

## Healthy Accessibility

- Large supermarkets over 40,000 square feet have more shelf space and likely greater selection of healthy food options. 57.0% or 1,127,957 households live outside a 10-minute driving distance of a large supermarket, while 43.0% or 851,604 households live within this distance.
- For those households within this 10-minute driving distance, 51,252 households (6.0%) are without a car.
- 24.6% of rural Ohio households live within a 10-minute drive to fast food and not a large supermarket. These households face nutritional challenges compounded by high concentrations of nearby fast food alternatives. This is not just an urban phenomenon.

Figure 1 presents selected results of physical, economic and healthy accessibility of retail grocery stores.

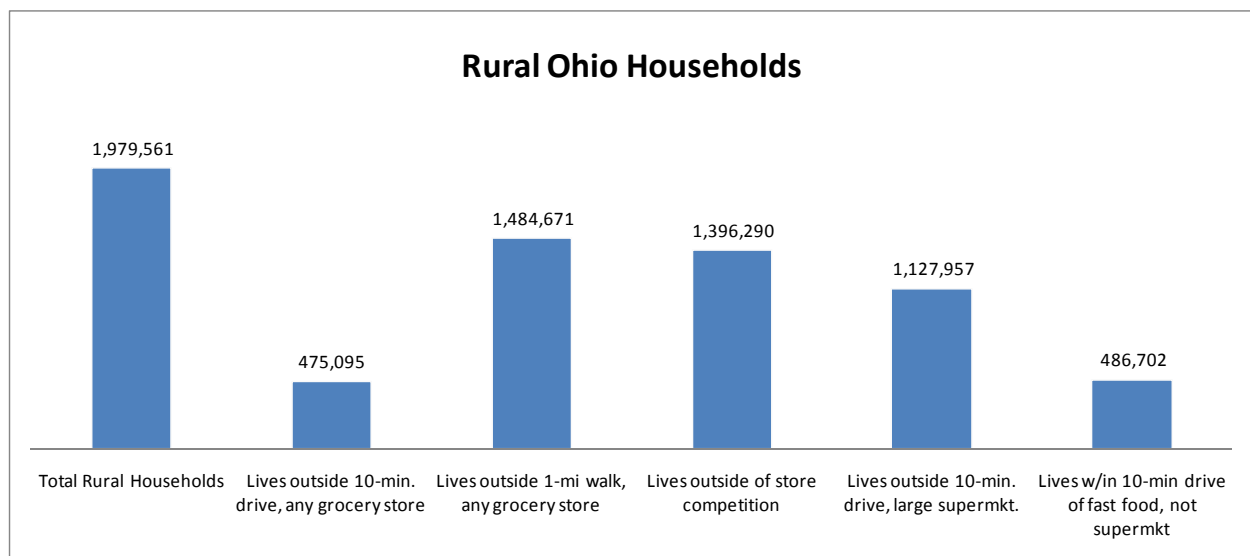


Figure 1. Comparing Access, Selected Results for 2008 Rural Ohio Households

## Conclusions

- While Ohio is often referred to as an urban state (with the most metropolitan areas of any state in the U.S.), access to food sold at retail outlets in *rural* areas is a problem.
- Lack of larger supermarkets (that, which larger shelf space, presumably carry a greater range of goods) and lack of competition (which suggests higher prices) are two issues that deserve attention in rural Ohio.
- Rural **food access gaps** should be discussed and addressed differently than urban food deserts because of marked contrasts in density, transportation, demographic composition, and capacity for home provisioning.

## 1.0 Introduction

Access to affordable and nutritious food by low income and rural communities has long been a concern to advocates, policymakers, and the general public. In the past, these concerns led to the creation of programs such as the Supplemental Nutrition Assistance Program (SNAP, formerly known as the Food Stamp Program), the Supplemental Nutrition Program for Women, Infants, and Children (WIC) which grants vouchers to buy specific nutritious foods at authorized grocery stores, and the National School Lunch and Breakfast Programs. Despite the advent of these food assistance programs, some low income rural communities are still considered food deserts. Specifically, increases in obesity and chronic diseases associated with poor diets have led to concerns that some low-income and rural communities lack access to affordable and nutritious foods. These concerns led Congress, in the 2008 Farm Bill, to request that the Department of Agriculture conduct a year-long study of these food deserts. Published in June (2009), the USDA study concluded that:

- 2.3 million (2.2%) of all U.S. households live more than a mile from a supermarket AND do not have access to a vehicle,
- 3.4 million (3.2%) of all U.S. households live between .5 to a mile AND do not have access to a vehicle,
- 4.4% of households in rural areas live more than 1 mile from the supermarket AND do not have access to a vehicle, and
- 22% of households in low-income urban areas live 1/2 to 1 mile from a supermarket with no access to a vehicle.

Likewise, the Ohio Food Policy Council is interested in understanding the extent of food deserts in rural Ohio for the purpose of recommending methods to reduce inadequate food accessibility in those communities. In August 2007, Governor Strickland established the Ohio Food Policy Council by Executive Order #27S. This executive order

expressed the environmental, social, and economic benefits that Ohio's food and farming system currently contributes to the state and the need to expand those benefits by focusing on retention

### **Ohio Food Policy Advisory Council**

([www.agri.ohio.gov/divs/FoodCouncil/foodcouncil.aspx](http://www.agri.ohio.gov/divs/FoodCouncil/foodcouncil.aspx))

Governor Strickland signed Executive Order 2007-27S which describes the environmental, social, and economic benefits that Ohio's food and farming system contributes to the state, as well as the importance of retaining and growing that industry to further expand those benefits. The Ohio Food Policy Advisory Council is a public-private partnership that provides a framework for collaboration leading to greater efficiency in developing and implementing recommendations address these benefits. The mission for the diverse stakeholders of the council is to:

- Collect and analyze information on the production and processing of food in Ohio as well as the patterns of food consumption
- Protect Ohio's valuable farmland and water resources by encouraging the growth of food products in Ohio
- Provide those in need with greater access to fresh and nutritious foods
- Assist Ohio farmers and businesses in marketing their food products inside and outside the state
- Develop strategies to link producers and consumers in local food systems

and expansion of the industry. **In addition, the order also addressed the critical importance of providing assistance to Ohioans who have limited or no access to healthy and fresh foods.** Consequently, a goal approved by the whole council is to “identify rural and urban food deserts in Ohio by Dec. 31, 2009, and decrease these areas by 10 percent by providing access to healthy, local foods by 2015.”

To this end, we conducted a study of Ohio rural food deserts. Specifically, we focus on three types of access to retail grocery stores<sup>1</sup>. The rest of the research brief will review the concept of food deserts, methods of identifying food deserts used in other study, our approach and then our results. Finally, we close the brief with conclusions regarding food access in Ohio rural communities and we make suggestions for future research in this arena.

## 2.0 What are Food Deserts?

The language in the 2008 Farm Bill defined a food desert as an “area in the United States with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower income neighborhoods and communities” (Title VI, Sec. 7527). In practical terms the method for identifying food deserts in this policy brief uses three broad aspects of accessibility - **physical accessibility, economic accessibility, and healthy accessibility** - with the assumption that most rural Ohioans purchase their fresh and nutritious food from retail food outlets (USDA ERS, 2009).

- Physical accessibility measures food accessibility by estimating vehicle travel time, walking travel distance, and public transportation accessibility. In other words, physical accessibility identifies households who are able to efficiently and easily access a food outlet via private and/or public transportation.
- Second, since household’s demand for food is a function of income and price, economic accessibility measures food accessibility by estimating median income, poverty rate, and calculating the level of local competition between supermarkets which determines local price level.
- Finally, the healthy accessibility aspect measures food accessibility by identifying households with access to larger food outlets. As larger food outlets have greater varieties of healthy food or protein selection, they are more likely to promote healthier communities.

## 3.0 Measuring Food Deserts

Over the past few decades, supermarkets have been moving out of older, urban, economically depressed neighborhoods in favor of the more affluent, newly built suburban developments, a process known as “redlining (Eisenhour, 2001).” Redlining is a result of both urban sprawl and consolidations in grocery retailing. Although redlining is a more recent issue in urban areas, to a certain extent, rural areas have historically been deprived of adequate access to nutritious food outlets. In order to measure the degree of redlining, a number of researchers in both academic institutions and private organizations have studied low-income persons' access to food in urban

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<sup>1</sup> Because this study analyses *all* of rural Ohio, it is necessary to use secondary data. Therefore, we focus only on retail grocery outlets as defined by the North American Industry Classification System (NAICS) and not on all places that rural Ohioans obtain food.

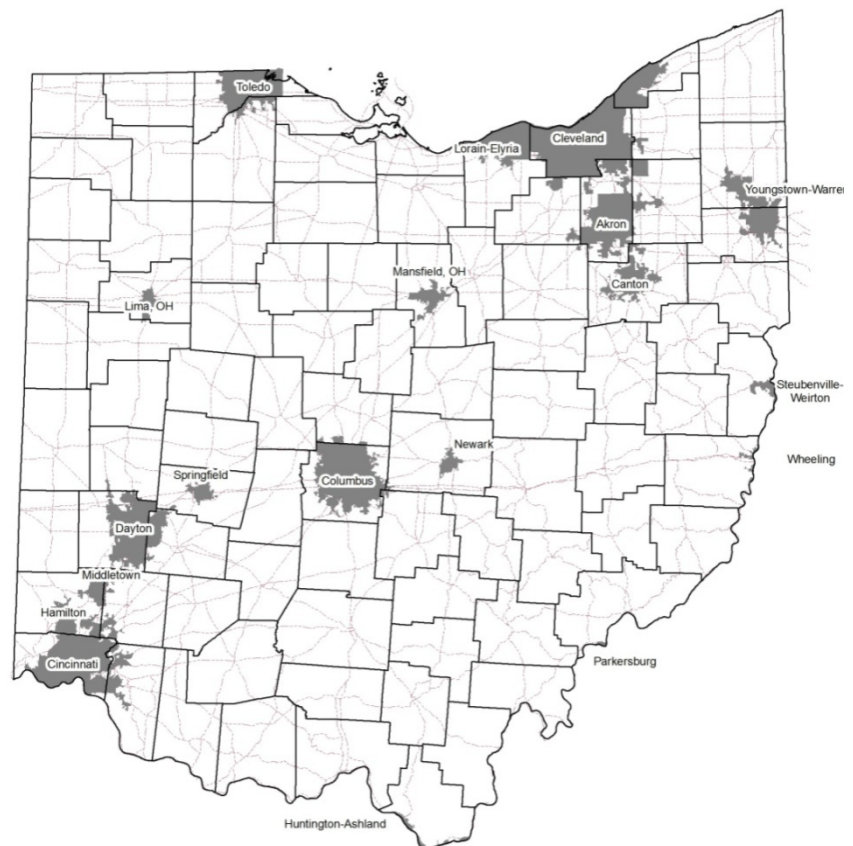
and rural areas. This research ranges from approximating the impact of food deserts on health outcomes to identifying areas serviced by less than two food outlets. We developed our approach, in part, from reviewing previous studies.

In Chicago, Gallagher (2006) estimates the impact of food deserts on public health by approximating a “Food Balance Score” which is done by dividing distance of every city block to the nearest fresh food outlet over distance to the nearest fast food restaurant. This is a very interesting concept because analyzing the distance to the closest store relative to the closest fast food restaurant gives an idea of relative food accessibility rather than measuring absolute food accessibility.

Rose et al (2009) used a 1 km radius to estimate service areas of supermarkets in New Orleans. They identify the number of people under the poverty line who live in and out of the supermarket service areas, and identify whether they have a car or not. Since their study was looking at a small geographical area, they also included shelf space from in-store surveys.

Apparicio et al (2007) used three measures of accessibility to food outlets to identify food deserts in Montreal, Canada. They used proximity (distance to the nearest supermarket), diversity (number of supermarkets within a distance of less than 1000 meters) and variety in terms of food and prices (average distance to the three closest different chain-name supermarkets).

Several other studies were done in California, Missouri, Texas, Mississippi, and many other states using similar methods with slight adjustments (Algert et al, 2006; Baker et al, 2006; Berg and Murdoch, 2008; Blanchard and Thomas, 2008). (Good overviews of previous studies are located in Section 7.0.) Some of the studies done in smaller geographical areas went a step further by identifying desirable and undesirable outlets by calculating the linear shelf space devoted to fruits and vegetables and the number of fresh produce varieties available (Rose et al, 2009); or by identifying stores that carry a certain number of healthy products such as the study done in East Harlem and Upper East Side, New York City (Horowitz et al, 2004).



Map 1. Ohio's Urban and Rural Areas



Although most studies of food deserts focus on urban areas, we can learn from the tools and procedures used. Therefore, in this study, we will use some of the tools used in the above studies and alter them to fit the specific requirements and limitations of rural Ohio.

## 4.0 Measuring Food Accessibility in Rural Ohio

In this section we examine food accessibility in rural Ohio along the three axes of accessibility - physical accessibility, economic accessibility, and healthy accessibility. We consider “rural” Ohio to be those areas of the state designated as not urbanized in the 2000 United States Decennial Census. Urbanized areas of those places with generally 50,000 people or more and are densely settled. Densely settled census block groups have at least 1,000 people per square mile and adjacent census blocks that have an overall density of at least 500 people per square mile. Map 1, created by using US Census TIGER files, illustrates urbanized areas in gray and rural areas in white. (For a reference map of Ohio counties, see Appendix A.)

Both the retail grocery store and demographic spatial data are estimated for 2008 using retail data from infoUSA and demographic data from ESRI’s Business Analyst. We estimate that a total of 5,209,819 Ohioans are living in rural areas (1,979,561 out of 4,627,893 households). In this study, we focus on households because that is the standards set by the ERS (2009) study. We use the 4-digit NAICS code 4451 for supermarkets, other grocery and convenience stores. We added in large super-centers that carry a full-line of grocery products among other lines of products, such as WalMart. We refer to both of these types of stores as **retail grocery stores** in general. Therefore, retail grocery stores entail all sizes of outlets from corner stores to super-centers. When we refer to *large* supermarkets, we narrow down grocery stores to include only those stores with 40,000 square feet or greater (see Figure 1). The median square footage of a supermarket was 47,500 in 2007, with big boxes over 100,000 square feet.



Figure 1. 40,000 square foot grocery store  
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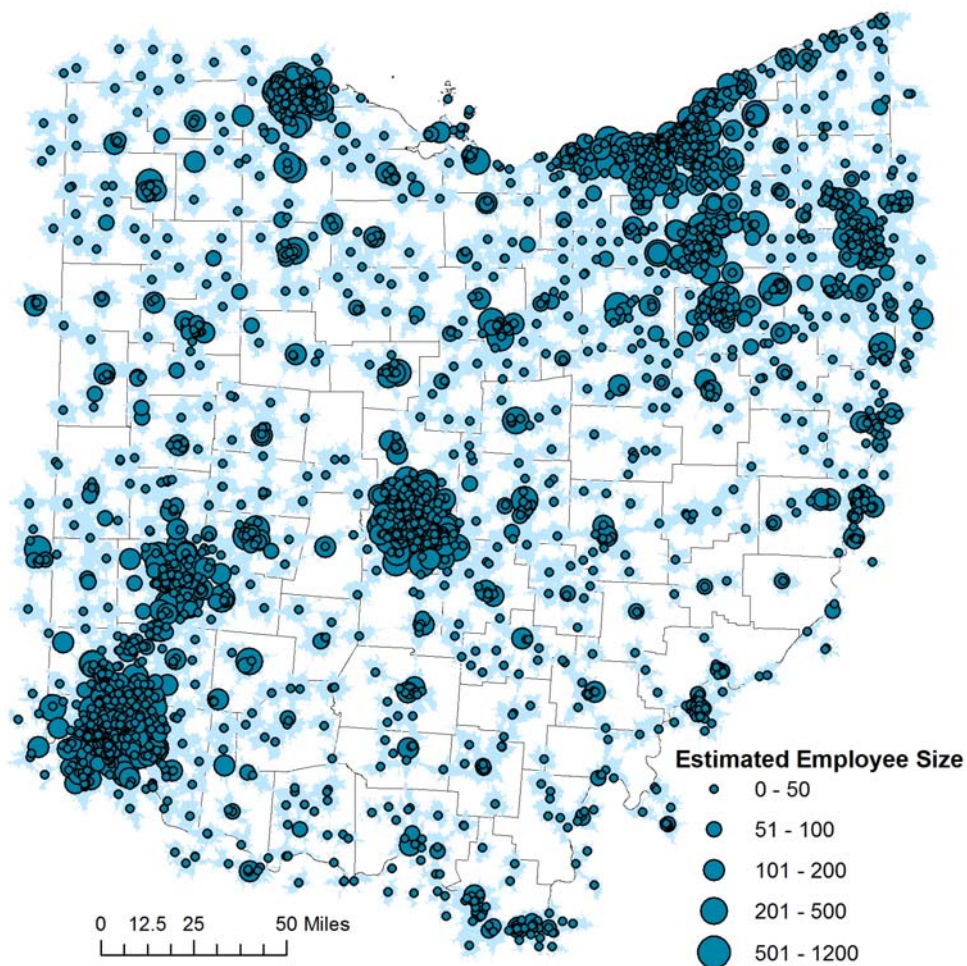
### 4.1 Geographical Accessibility

We measured physical accessibility in three ways: via driving, walking and, to a much more limited extent, public transportation. To capture the first segment of geographic accessibility, we identified the location of every retail grocery store in rural Ohio and those located near the border between Ohio and its bordering states (Michigan, West Virginia, Kentucky, Indiana, and Pennsylvania). Using road network, we calculated a 10-minute drive distance around these outlets (again, outlets ranging in size from a corner store to a super-center). Using block group data from the census, we estimate the

number of households living in and out of a 10-minute drive along roads (Map 2). The use of drive-time at this scale of study (all the rural areas in a state) is unique. Most often straight-line

distance is used, which is less accurate, particularly in rural areas where the road network is not as dense.

Our analysis estimates that 24% (or 475,095 rural Ohio households) of rural Ohioans households do not live within a 10-minute drive of a retail grocery store of any size, while 76% (or 1,504,466 rural Ohio households) live within this driving distance. Of the households living within a driving shopping area, 5% (or 75,223 rural Ohio households) do not own a car. In other words, 3.8% (or 75,223 rural Ohio households) of rural Ohioans live within driving distance of a food outlet AND do not have access to a vehicle.

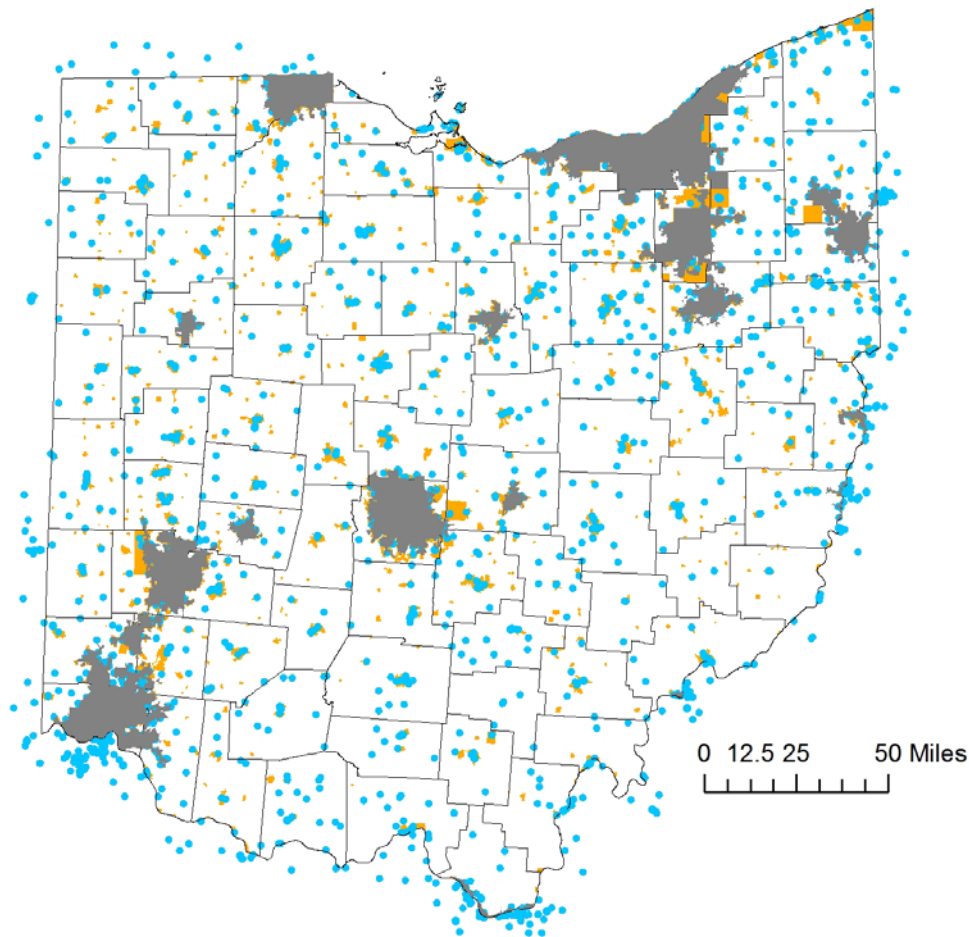


Map 2. 10-Minute Drive (in light blue) to Ohio Retail Grocery Stores (by Employee Size)

We also estimated the number of rural Ohioan households living within walking distance of a food outlet. We first created a 1-mile walk distance around each grocery store and calculated the number of rural households living in and out of the walking distance buffers (map 3). Seventy-five percent of rural Ohio households live greater than a 1-mile walk to a grocery store, while 494,890 rural Ohio households, or 25% of all rural Ohioan households, are within a 1-mile walk. Of the households living outside of the 1-mile walk, 4% (59,389 rural Ohioan households) do not

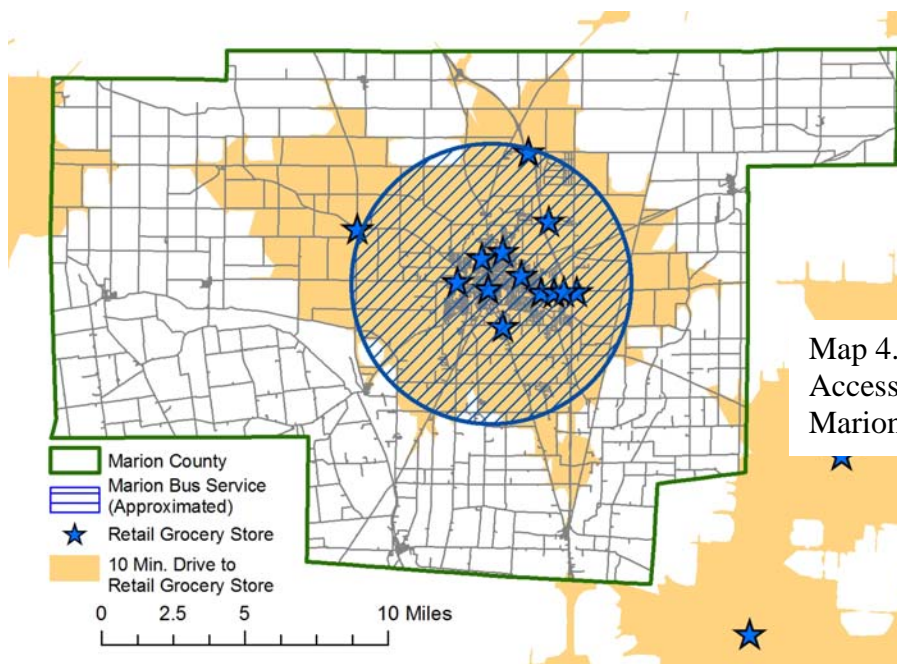


own a car. In other words, 59,389 rural Ohio households, or 3%, live more than 1 mile from a supermarket AND do not have access to a vehicle.



Map 3. 1-mile Walk to Ohio Grocery Stores (in blue) with Rural Cities and Villages (in orange)

To capture the third element of physical accessibility, we focus on public transportation. Bus service is very inconsistent across rural areas of Ohio. Further, due to the lack of complete data on bus accessibility in rural Ohio, we will limit our study to a couple of case studies. In Marion County, the bus service is available within the downtown area and 5 miles around the downtown area (Map 4). Therefore, we first estimated the bus service area by creating a 5 mile-radius around downtown Marion. Then, we calculated the total number of households inside and outside the bus service area. We concluded that 72.5% of Marion County households (or 18,165 Marion County households) live within a bus service area. Most of the grocery stores are within this bus service area, but 27.5 % of Marion county households (or 6,890) do not live within a bus service area. Further, 2.4% of households (or 601) live outside of a bus service area AND do not own a car. Also, 38.7% of households (or 9,696) live outside of a 10-minute drive (in orange on the map), while 1% of Marion County households (or 251 households) live outside of a 10-minute drive AND do not own a car AND live outside of a bus service area.



Map 4. Retail Grocery Store Access via Public Transportation, Marion County

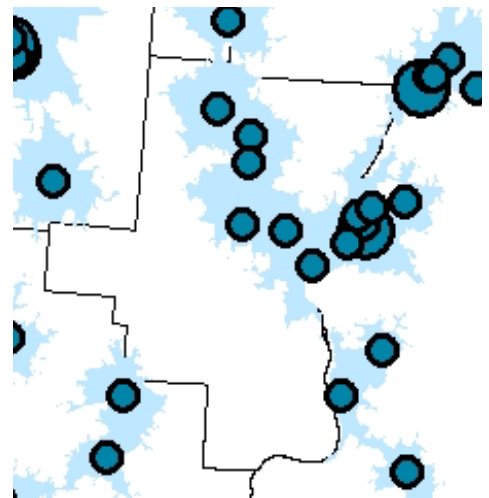
Other counties, such as Gallia County, have no bus service. As Map 5 demonstrates, Gallia County has disproportionately more of its areas designated as a food desert. The Gallia County Council on Aging does provide transportation for Gallia County senior citizens age 60 and older to grocery stores. There are exceptions for individuals between 50 and 60 years of age. Therefore most individuals in Gallia County under 60 years old have limited access to grocery stores and must secure alternative transportation, which can be a double burden for those residents with low incomes.

#### 4.2 Economic Accessibility

Next we examine economic accessibility of food.

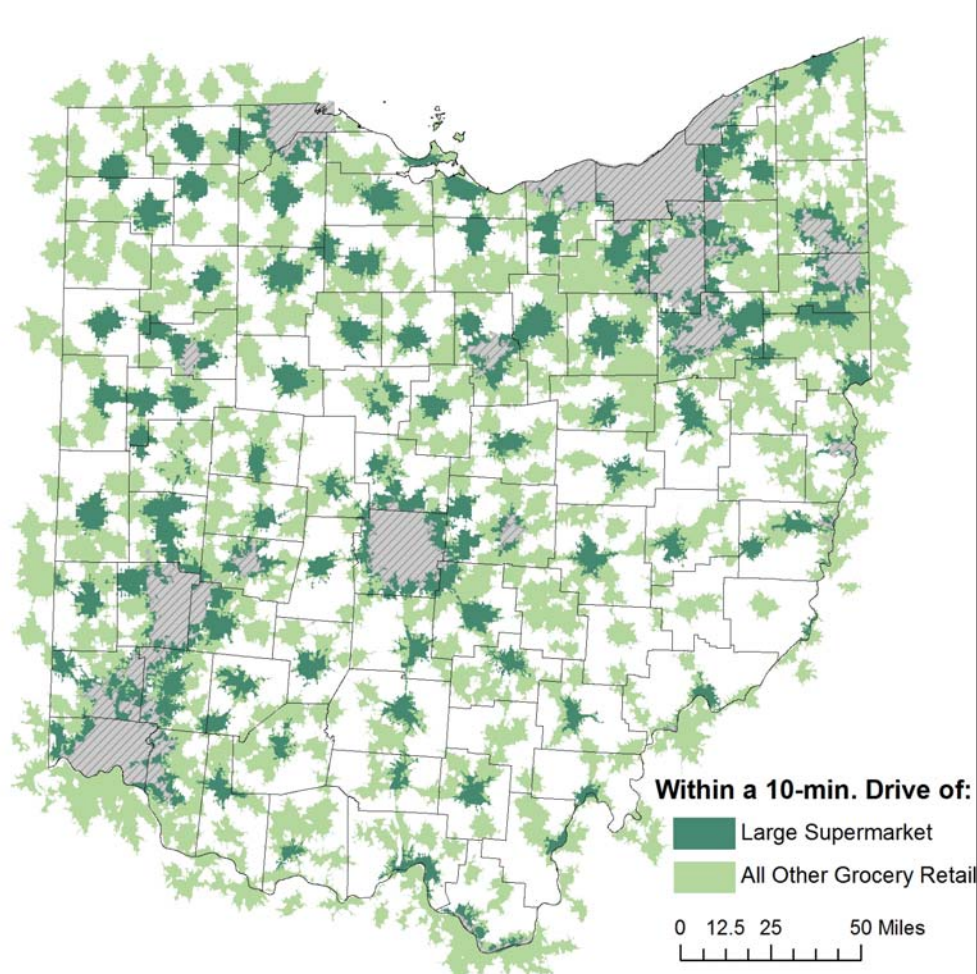
Economic accessibility is divided into an income and price segments since demand for food is function of both **income and price**. Limited accessibility due to low income was captured by measuring the median per capita income and households within incomes under

\$10,000 living inside and outside of both the 10-minute drive and 1-mile walk of grocery stores. We estimated that the median yearly per capita income of households living further than a 10-minute drive is \$22,371 and \$23,105 for households living within a 10-minute drive, which is statistically different. For rural Ohio households making under \$10,000, we found that 9.7% of these households (or 134,827 households) live within a 10-minute drive and 9.9% of households (or 42,223 households) live outside a 10-minute drive.



Map 5. Gallia County 10-Minute Drive to Ohio Grocery Stores (by Employee Size, See Map 2)

To capture the price segment of economic accessibility, we will identify communities dominated by a single large supermarket (>40,000 sq feet). The assumption is that communities dominated by one food outlet are more likely to face higher prices, an indication of food affordability, because of monopolistic forces (Basker, 2005). We find that only 583,271 of rural households (29.5%) live in areas where there is some competition – being within a 10-minute drive of *more than one* large supermarket (Map 6). That means that 71.5% of rural Ohio households live outside areas of competition. We find that 268,333 households (13.6%) live in areas that are dominated by one larger supermarket, which may have higher prices because of lack of competition. Of these households, 16,786 of them (or 6.3%), do not own vehicles to drive to a more competitive zone.



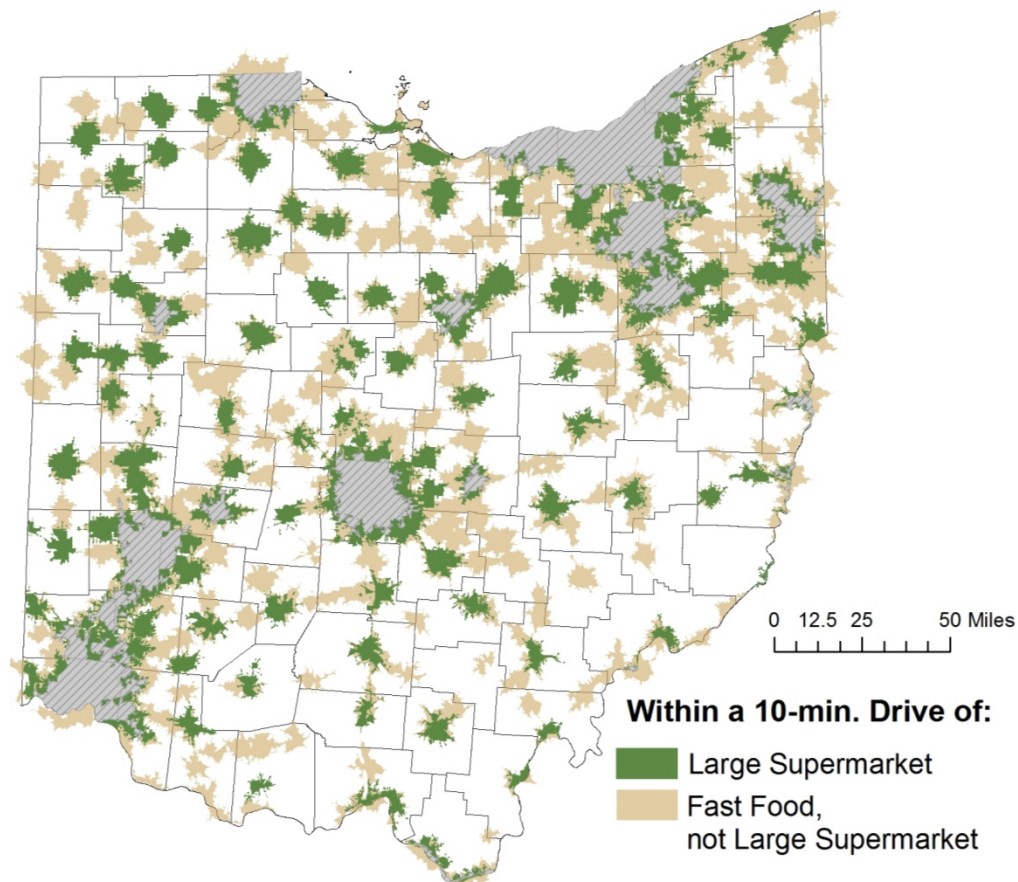
Map 6. Geography of Large Supermarket Competition

#### 4.3 Healthy Accessibility

To estimate health accessibility, we first selected large supermarkets with more than 40,000 sq ft. In this analysis, an assumption is made that larger stores have more shelf space and a larger variety of goods. We estimated that 43.0% or 851,604 households live in a 10-minute drive of a large supermarket, and 57.0% or 1,127,957 households live outside this distance. For those households within this 10-minute driving-distance, 51,252 households (6.0%) are without a car.



To further explore healthy accessibility, we compare accessibility of limited service restaurants (often referred to as fast or convenience food establishments) to accessibility of large supermarkets. In particular, we are interested in how many rural Ohioans are within a 10-minute drive distance from a fast food restaurant<sup>2</sup> and *not* a 10-minute drive to a supermarket. Map 7 illustrates in green, those areas of rural Ohio that are more proximate to fast food than they are to a supermarket. Those households in white areas are outside a 10-minute drive of both fast food and large supermarkets. Therefore, households in green and white areas on this map suffer from physical and healthy inaccessibility. The 486,702 rural households in green areas (or 24.6% of rural Ohioans), however, also face nutritional challenges compounded by high concentrations of nearby fast food alternatives. This situation is what Gallagher (2006) calls the “Food Balance Effect.”



Map 7. Rural Ohio Areas with Fast Food Access and not Large Supermarket Access (in green)

## 5.0 Conclusion

Food deserts exist throughout the United States in areas where individuals lack physical, economic, and healthy accessibility to sufficient food products. Food deserts have traditionally been discussed in an urban context, but can exist in both urban and rural areas, as supermarkets continue to move towards newer suburban developments characterized by higher incomes and

<sup>2</sup> To define fast food restaurants we used the North American Industry Classification System (NAICS) definition for “Limited-Service Eating Places” (72221).

greater buying potential. This is important for Ohio, a state that features several substantial urban centers, but is also home to a significant rural population (nearly 43 percent of Ohio households).

The 2009 food desert study conducted by the USDA found that 2.2% (2.3 million) of all U.S. households live outside of walking distance, or a one-mile radius, of a supermarket, and do not own a vehicle. However, that number rises to 4.4% when only rural households are considered. Similarly, 3% (59,389) of rural Ohio households live beyond a 1-mile walk of a retail grocery store of any size and do not own a vehicle. It is important then, to note that rural areas, with their greater distances, present a unique challenge to food access.

Findings suggest that Appalachian and western portions of Ohio entail greater food gaps. Appalachia, in particular, suffers from a lack of large supermarkets. Further, much of rural Ohio is afflicted by little economic competition between large outlets. Lack of larger supermarkets (that, which larger shelf space, presumably carry a greater range of goods) and lack of competition (which suggests higher prices) are two issues that deserve attention in rural Ohio.

Previous studies offer policy recommendations for increased access including: creating new outlets, increasing the healthiness of food offerings at existing outlets, developing new transportation opportunities, and utilizing alternative distribution methods. These recommendations however, focus on solutions applicable primarily to urban food deserts, and although helpful, do not fully address the unique aspects of rural food deserts. Rural food deserts should be considered differently for several reasons, but primarily because of issues arising from their lower densities.

Although rural areas do have some instances of high population density, usually centered around county seats and villages, they do not compare to cities such as Chicago, New York, or Philadelphia (that are pioneering solutions to urban food deserts). Because of their proportionally larger physical reach, rural food deserts present challenges to efficient public transportation solutions. Perhaps most importantly, rural food deserts often have access to more land, and thus possess a greater capacity for home provisioning, a possibility that would enable households to grow an indigenous solution to gaps in rural food access.

## **6.0 Further Work Needed**

Importantly, this research examined rural food access on a statewide scale. Because of its breadth, this study was limited in its ability to encompass all aspects of rural food access. For example, the high numbers of retail grocery stores inhibited the verification of every individual location. Further, because of the number of supermarkets, we could not examine what was actually being sold in the store. Finally, for purposes of estimation, the study assumed the even distribution of households across each census block group.

Ideally, further study would build on this research by examining further rural points of food access such as farmer's markets, other venues that are not considered retail grocery stores, but sell food (like dollar stores), and other methods such as reciprocity and redistribution used by low-income households to increase food access (Wright-Morton, 2008). In addition, further



study should explore alternate means of rural transportation and food distribution techniques and how rural food desert solutions may differ from the urban context.

## **7.0 Resources**

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## **Acknowledgements**

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## Appendix A. Ohio County Reference Map

