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Identifying Corner Store as the Future of Healthy Food Access in African American Communities

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ABSTRACT

For many people, the corner store remains the main grocer, or the only source of sustenance in minority communities. This study examined the distribution of corner stores as a future reference point to provide healthy food access to predominantly African American communities that lack full service grocery stores. Business data was obtained from respective county by use of Standard Industrial Codes. Each corner store was then categorized by either being Full Service (Stores that sell fresh produce, fresh meat, fresh dairy, and processed foods) or Non-Full Service (stores that do not sell all four categories of foods included in the full service store definition). Addresses were geocoded and mapped to census tracts and census block groups (CBG) using ArcGIS. Of the 249 names and addresses of corner store within the 230 census tracts in Mecklenburg County, 113 census tracts are without a full service store. 37 of the 113 census tracts have a corner store located within them. These 37 census tracts are located within predominantly African American communities (47.55%) with a median household income 27.46% less than the county median household income. 36 of the 37 census tracts have a Supplemental Nutrition Assistance Program (SNAP) approved vendor, while only 21 of the 37 census tracts have a Women, Infants, and Child (WIC) approved vendor. Using this data, county-wide discussions can begin on providing corner stores the necessary subsidies and support to assist them on offering a wide variety of healthier foods at affordable prices to low income, minority communities.

Keywords: Food insecurity; food access; corner stores; food desert; African American

INTRODUCTION

The health of America's citizens is an important topic coming to the forefront with our record rates of obesity and heart disease. Research has shown that people tend to make food

choices based on the food outlets that are available in their immediate neighborhood (Furey et al., 2001), so residences which lack access to fresh food poses major barriers to purchasing nutritious foods (Whelan et al., 2002). Because of this, evaluation of the neighborhood environment as it relates to food access is a growing area of research.

Supermarkets have been fleeing inner city neighborhoods for decades now, drawn to the open land and clientele of the suburbs (Pothukuchi, 2005). Recent empirical studies of food deserts in the United States have focused on the overarching racial/ethnic disparities and income/socioeconomic status of these areas. In an examination of the associations between the availability of food stores in the U.S and race, ethnicity and socioeconomic status, Powell et al. (2007) found that the availability of chain supermarkets in black neighborhoods was only 52% of that of their white counterparts. A similar study used geographic information systems (GIS) to measure spatial accessibility of chain supermarkets with respect to neighborhood racial composition and poverty in Detroit, Michigan. Their findings showed that the most impoverished neighborhoods in which African Americans resided were 1.1 mile farther from the closest supermarket compared to the most impoverished White neighborhoods (Zenk, et al., 2005).

Using the traditional food desert mapping as defined by the United States Department of Agriculture (USDA) (2011) as "...a low-income census tract where a substantial number or share of residents has low access to a supermarket or large grocery store," as there are certainly urban neighborhoods that lack food service grocery options. However, while "food desert" is primarily a geographic distinction that tells us about food availability within a low-income community, it does not reveal enough about the lived experience of households. The concept of food security "means that all household members have access at all times to enough food for an active, healthy life" (Coleman-Jensen et al., 2015).

Because convenience stores are in the same classification system as grocery stores according to the North American Industry Classification System, food deserts may not be easily recognized despite the discrepancy in products offered (Food Empowerment Project, 2010). If a food desert resident wants more than what the neighborhood convenience store or fast food restaurant can offer, this means that travel to a grocery store is involved, demanding a sacrifice of both time and money (Access to Affordable and Nutritious Food, 2009).

For many, the corner store remains the main grocer, or the only source of sustenance in minority communities. This study examined the distribution of corner stores as a future reference point to provide healthy food access to predominantly African American communities that lack full service grocery stores.

METHODS

This study examined the food stores and characteristics of the 230 census tracts in Mecklenburg County, NC. A number of data sources were pooled for this project to provide data at the census tract level; including store, demographics, and SNAP and WIC participation data. This study also utilized census tracts, census block groups, and 2-mile radius mapping to focus on the true accessibility of food within Mecklenburg County.

Data was collected from the data processing corporation, Business Wise, to identify food stores. All food stores with the following Standard Industrial Classification (SIC) codes in operation as of February 23, 2015 were used in this analysis: 5331C-Variety Stores, 5411C-Convenience Store: Without Gasoline, 511R-Grocery Store, 5421-Meat & Seafood: Including Freezers, 5431-Fruit & Vegetables, 5441-Candy, Nut, and Confectionery Store, 5451-Dairy

Products Store, 5499-Miscellaneous Food Store, 5541C-Gasoline Station: With Convenience Store. Maps were then created using ESRI ArcMap 10.2 and ArcGIS Online (Mecklenburg County, 2015).

Each food store was verified by phone, or on-site inspection, by research support staff. Research support staff was trained to call a store to determine that it was open for business and to obtain information about the types of food sold in each store. The purpose of obtaining this information was to determine the types of food being sold at the establishment. If store staff could not be reached by phone, or if the researchers could not communicate with store staff over the phone, research staff conducted an in-person verification by visiting the store. The protocol remained the same for an in-person verification where research support staff visually confirmed the store's existence as well as determined the types of food sold at each store. While at the store, researchers made observations to determine the types of food being sold. Some establishments do not lend themselves to easy categorization and were, therefore, categorized based on food offerings and type of services provided.

In addition, stores were identified as a WIC-approved and/or SNAP-approved store. These data sets were pulled from the USDA Food and Nutrition Service and from the Mecklenburg County WIC program website.

RESULTS

This study utilized census tracts, CBG, and 2-mile radius mapping to focus on the true accessibility of food within Mecklenburg County. From this, stores were mapped utilizing CBGs and 2-mile radius. Each food store was categorized based off of the categories listed in Table 1. This shows that not only location of food stores is in CBG mapping, but all food access based off of 2-mile service area radius, to include each type of identified food store.

Table 1. Categorizing Food Stores

Category Name	Description of Food Store
Full-Service Store	Stores that sell fresh fruit, fresh vegetables, fresh meat, fresh dairy, and processed foods; typically, what many would consider a grocery store or supermarket, but also includes food warehouse and discount stores.
Fresh Produce Store	A store that sells fresh produce, carrying three or more varieties of fruits and vegetables (six total options), was determined to have “fresh produce.” This can include any type of store already categorized.
Corner Stores	Small, usually independent stores that do not sell gas. Examples can be convenience stores, general merchandise stores, and pharmacies.
International Market	A store that focuses on food for a specific race and/or ethnicity.
Convenience Store with Gas Station	A store that sells gas (automotive fuel), that also sells food.
Specialty Food Stores	Establishments that specialize in in a small selection of food items, such as meat & seafood markets, year-round farmers markets, bakeries, and other establishments that offer primarily one non-entrée food, such as coffee, ice cream, donuts, and cookies.
Traditional Restaurant	Food typically prepared in response to order, with table service.
Fast Food Restaurant	Little menu variety, serving lines or walk-up service, frequently includes drive-through service.
Take & Eat Food Options	A store that sells pre-made food that regularly does not require some sort of preparation by the consumer, and is ready to be consumed at time of purchase.

Mecklenburg County is home to just over 1 million residents. To serve those 1 million residences data sources show that there are 2,078 total food stores as of February 2015 (Table 2).

Table 2. Types of Food Stores in Mecklenburg County, North Carolina

Type of Food Store	Number of Stores (N)
Total Food Stores	2,078
Full Service Stores	182
Fresh Produce (fruits & vegetables)	230
Corner Stores	241
International Markets	65
Convenience Store with Gas Station	138
Specialty Stores	213
Traditional Restaurant	1,077
Fast Food Restaurant	169
Take & Eat Food Options	485

Full Service Stores

182 full services stores were identified in within Mecklenburg County, North Carolina, serving 537,138 (52.51%) of the total population as identified through census data (US Census, 2010) 172 (94.51%) are SNAP approved, while only 117 (64.29%) are approved WIC Stores.

117 census tracts contained a full service store, serving 537,138 residents. Median age is 34.68, with a median household size of 2.48. The median household income is \$61,639.65, with 49.37% earning under the household median income for Mecklenburg County (\$55,444). Race makeup of households is: 50.29% Caucasian, 26.75% African American, 10.26% Hispanic, 4.65% Asian, 0.40% American Indian, 0.06% Hawaiian/Pacific Islander, 2.26% 2 or more races, and 5.34% other race (Figure 1).

113 (49.13%) census tracts are without full service store, 434,721 residents that are not provided for. Median age is 34.46, with a median household size of 2.55. The median household income is \$61,011.77, with 46.02% under the household median income for Mecklenburg County (\$55,444). Race makeup of households is: 49.09% Caucasian, 27.12% African American, 11.45% Hispanic, 3.68% Asian, 0.43% American Indian, 0.07% Hawaiian/Pacific Islander, 2.31% 2 or more races, and 5.85% other race (Table 3).

Figure 1. Full Service Stores by CBG

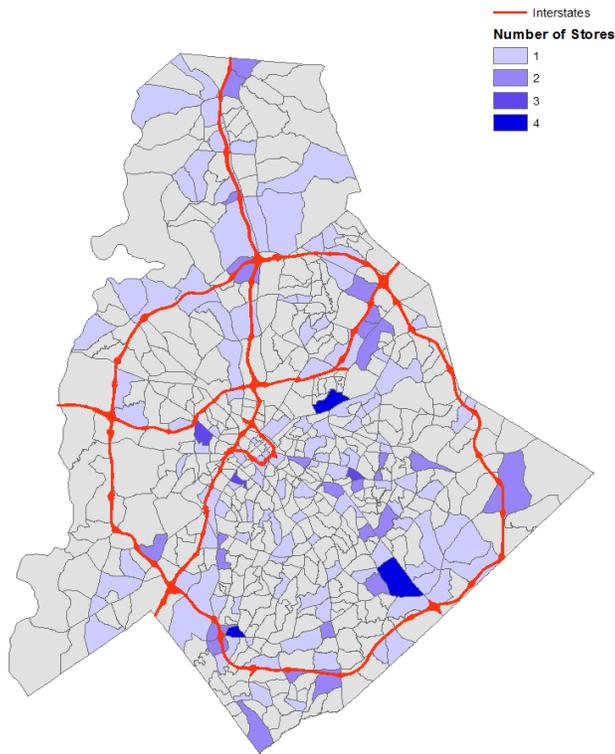


Table 3. Full Service Stores vs. Non-Full Service Store Demographics by Census Tracts

Demographics	Full Service Stores	Non-Full Service Stores
Census Tracts (N)	117	113
Residents (N)	537,138	434,721
Age (M)	34.68	34.46
Household Size (M)	2.48	2.55
Household Income (M)	\$61,639	\$61,011
Living Below Mecklenburg County Median Income (%)	49.37	46.02
Race of Household: Caucasian (%)	50.29	49.09
Race of Household: African American (%)	26.75	27.12
Race of Household: Hispanic (%)	10.26	11.45
Race of Household: Asian (%)	4.65	3.68
Race of Household: American Indian (%)	0.40	0.43
Race of Household: Hawaiian/Pacific Islander (%)	0.06	0.07
Race of Household: 2 or More Races (%)	2.26	2.31
Race of Household: Other Race (%)	5.34	5.85

Corner Stores

108 census tracts contained total of 249 corner stores, serving 480,414 (47.01%) of the total population. 40 of the 249 corner stores were classified as Full Service and an additional 33 corner stores offered fresh fruits and vegetables. (Figure 2).

Median age is 33.06, with a median household size of 2.51. The median household income is \$49,195.49, with 71.30% earning under the household median income for Mecklenburg County (\$55,444). Race makeup of households is: 38.44% Caucasian, 34.60% African American, 13.02% Hispanic, 3.68% Asian, 0.46% American Indian, 0.08% Hawaiian/Pacific Islander, 2.39% 2 or more races, and 7.33% other race.

Within the 113 census tracts without a full service store, 37 of those had at least one corner store within its limits. A total of 75 corner stores were identified in 50 CBGs within the 37 census tracts (Figure 3), surpassing any other food store option (International Markets: 7, Specialty Stores: 22, and Gas Stations with a Convenience Store: 34), with the exception of Traditional Restaurants (94).

Figure 2. Total Availability of Corner Stores by CBG

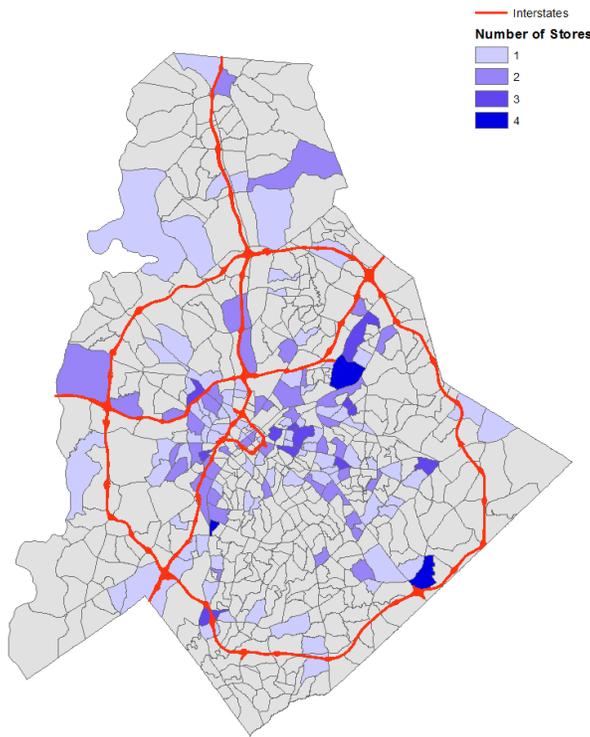
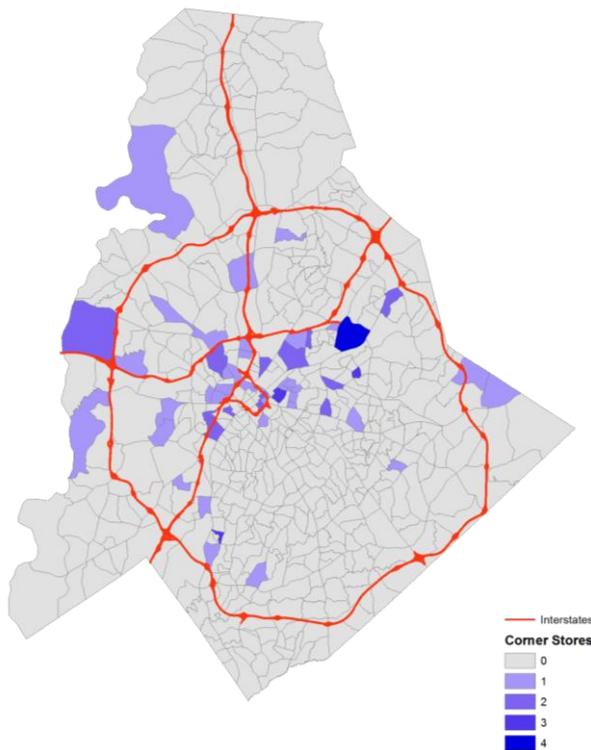


Figure 3. Availability of Corner Stores within Non-Full Service CBGs



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These 37 census tracts have a population of 129,727 and located within predominantly African American communities (47.55%). These census tracts have a median household income that is 27.46% (\$42,053.30) less than the median household income for Mecklenburg County (\$55,444). Median age is 32.10, with a median household size of 2.55. While 36 of the 37 (97.37%) census tracts have a SNAP approved vendor, only 21 of the 37 (56.76%) have a WIC approved vendor (Table 4).

None of the identified corner stores were classified as Full Service, however nine corner stores offered fresh fruits and vegetables. Other food offerings within these corner stores include: six corner stores with a restaurant located within them, 13 sell fresh vegetables, three sell fresh meat, 13 sell fresh dairy, one has a deli, and 23 sell prepared take & eat food (Table 5).

Table 4. Full Service Stores vs. Non-Full Service Store Demographics by Census Tracts

Demographics	Corner Store and Full Service Store	Corner Store without a Full Service Store
Census Tracts (N)	108	37
Corner Stores (N)	249	75
Residents (N)	304,666	129,727
Age (M)	33.53	32.10
Household Size (M)	2.48	2.55
Household Income (M)	\$50,787	\$42,053
Living Below Mecklenburg County Median Income (%)	71.30	73.59
Race of Household: Caucasian (%)	41.18	36.45
Race of Household: African American (%)	33.98	47.55
Race of Household: Hispanic (%)	11.56	17.14
Race of Household: Asian (%)	3.99	3.05
Race of Household: American Indian (%)	0.44	0.55
Race of Household: Hawaiian/Pacific Islander (%)	0.07	0.13
Race of Household: 2 or More Races (%)	2.24	2.95
Race of Household: Other Race (%)	6.53	9.51
SNAP Approve Stores (%)	100.00	97.37
WIC Approved Stores (%)	83.58	56.76

Table 5. Types of Food Sold in Corner Stores Located within Non-Full Service Census Tracts

Type of Food Sold	Number of Stores (N)	Percentage of Stores (%)
Fresh Produce (Both Fruit & Vegetables)	9	12.16
Fresh Fruit	9	12.16
Fresh Vegetables	12	16.22
Fresh Meat	3	4.05
Deli Counter	13	17.57
Processed Food	74	100.00
Take & Eat	23	31.08
Restaurant	6	8.11

2-Mile Radius Mapping

2-mile radius mapping were utilized due to the fact that households are, on average, 2.1 miles from the nearest SNAP-authorized supermarket (United States Department of Agriculture, 2015). 2-mile radius maps were created for the 182 full service stores (Figure 4) and for the 249 corner stores (Figure 5) within Mecklenburg County, NC. The full service store map and the corner store map was then overlaid to show true service areas of both, full service and corner stores (Figure 6).

Based on 2-mile radius mapping of full-service stores, 16 CBGs were identified as areas interest for improving healthy food access though corner stores. These 16 CBGs have a population 30,820, with a median age is 33.61 and a median household size of 2.83. The median household income within these 16 CBGs is \$45,334.13, with 64.28% earning under the household median income for Mecklenburg County (\$55,444). Race makeup of these CBGs is 63.24% minority based, with: 36.76% Caucasian, 37.76% African American, 13.08% Hispanic, 4.46% Asian, 0.54% American Indian, 0.21% Hawaiian/Pacific Islander, 2.14% 2 or more races, and 6.12% other race (Table 6).

Figure 4. Full Service Stores

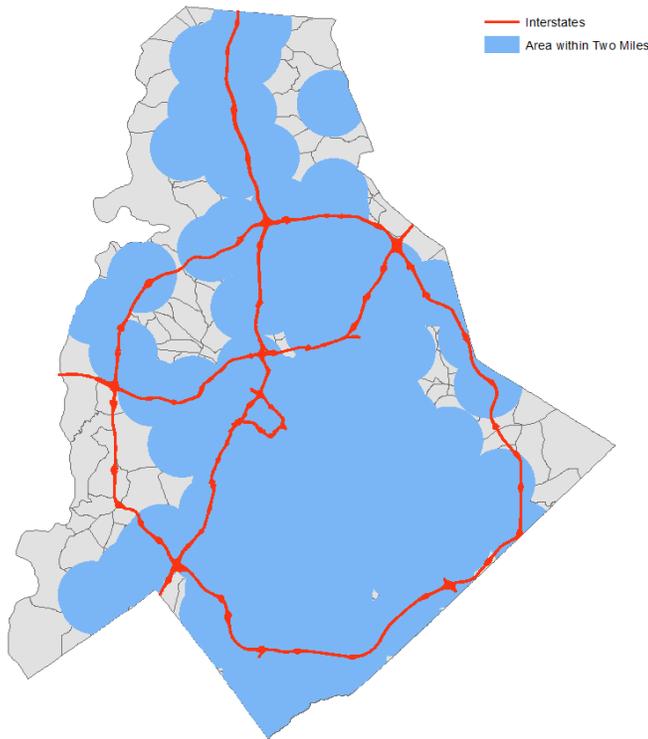


Figure 5. Corner Stores

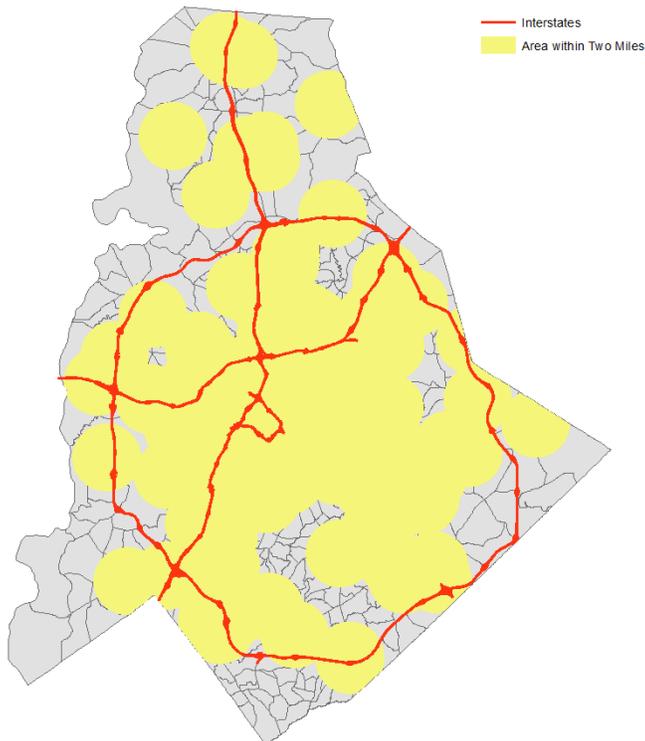


Figure 5. Overlay Map of Full Service Store & Corners Stores

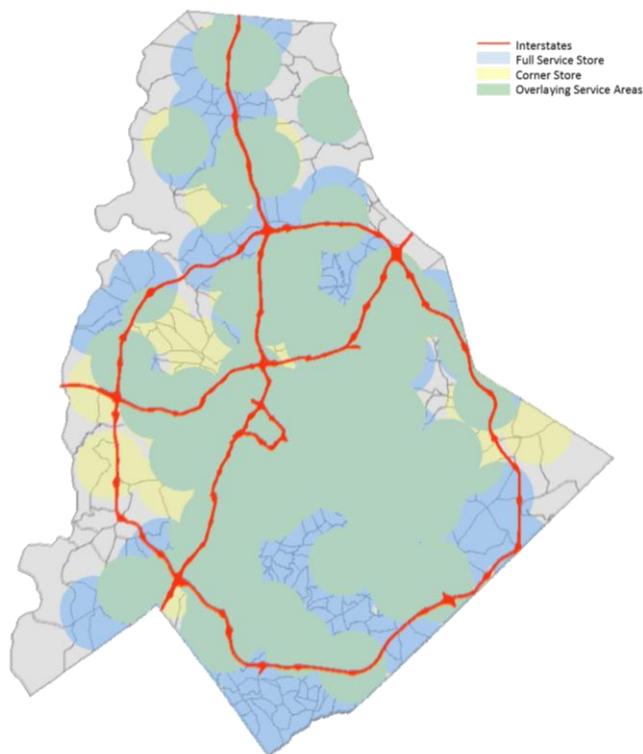


Table 6. CBGs with a Corner Store and No-Full Service Store

Demographics	CBGs
Census Block Groups (N)	16
Residents (N)	30,820
Age (M)	33.61
Household Size (M)	2.83
Household Income (M)	\$45,334
Living Below Mecklenburg County Median Income (%)	64.28
Race of Household: Caucasian (%)	36.76
Race of Household: African American (%)	37.76
Race of Household: Hispanic (%)	13.08
Race of Household: Asian (%)	4.46
Race of Household: American Indian (%)	0.54
Race of Household: Hawaiian/Pacific Islander (%)	0.21
Race of Household: 2 or More Races (%)	2.14
Race of Household: Other Race (%)	6.12

DISCUSSION

Given the soaring rates of obesity and heart disease in the United States this evaluation of neighborhood food access is critical in addressing how to give those in low-income and minority communities' access to healthy foods. Previous studies show that because of the massive supermarket migration from the cities to the suburbs low-income neighborhoods have become less likely to have access to healthier food that is also affordable (Song, et al., 2009).

The 2015 Charlotte-Mecklenburg County State of the Plate report highlights the food insecurity issue within Mecklenburg County. 35% of households with children in Mecklenburg County are considered food insecure (limited access to food based on lack of money and other resources) compared to 19% nationally (Charlotte-Mecklenburg Food Policy Council [CMFPC], 2016). Those 35% of families may have access to fast food or processed foods from businesses, but healthy food options are limited or non-existent making it almost impossible for families to make good choices for themselves.

In neighborhoods that lack access to full service grocery stores, many residents rely on their local corner stores for most of their food purchases. Unfortunately, as our research shows these corner stores sell predominantly processed, unhealthy foods, and carry little or no fresh produce. Corner stores should shift to focusing on addressing the needs of their communities.

In Mecklenburg County, there are 434,721 people who are left without a full service grocery store that is available or easily accessible to them, but out of those 129,727 people (47.55% African American) could be served in a full service capacity if the corner stores in their areas increased their offerings of fresh produce, dairy, and meat (CMFPC, 2016).

Currently only 56.76% of corner stores located in census tracts without a full service store are a WIC approved provider. Increasing food options within corner stores would enable them to move towards becoming a full service grocer. However, if those stores are not an approved WIC provider it would still limit access to the residents that would utilize it. As such, corner stores that move to becoming a full service grocer should also be given the opportunity to apply as a WIC provider. Access without availability to a larger service population must be addressed, not only to increase access for those on WIC but also to increase the market size for each corner store. Another benefit from increased access shows that the availability of healthful food also increases significantly when stores become a WIC-authorized (Hillier, et al, 2012).

For corner stores to be able to better serve their communities they need to be given the tools and resources to do so. Investing in expanding community corner store capacity, to include the sales of healthy food options is promising for filling the void left by the lack of full service grocery stores. This can be done in many of ways, but may include: 1) building edible gardens in the vicinity or on the property of corner stores, 2) host a farmer's market outside their stores during the summer months, 3) act as a Community Supported Agriculture (CSA) pick-up location, and 4) county/city provided assistance to stores for infrastructure improvements to be able to sell fresh food options.

CONCLUSION

Consumer choices about food spending and diet are likely to be influenced by the accessibility and affordability of food retailers, i.e. travel time to shopping, availability of healthy foods, and food prices. Those with low income may face greater barriers in accessing healthy and affordable food retailers, which may negatively affect diet and food security. For these communities, corner stores are often the most convenient places to purchase food.

Given that communities where corner stores are predominant are minority-based, lower income communities, providing these communities with fresh food at an affordable price may be difficult. Many corner store owners are not familiar with selling fresh produce or other perishable items, and lack the skills and knowledge to do this well. They may not know how to buy, price, handle, or market these items, and may not be aware of all the distribution options available to them.

For corner store owners that are, it still may be difficult as some neighborhoods might be willing to purchase fresh, whole fruits and vegetables. Other neighborhoods may lack food preparation knowledge with working with healthy foods, which may lead individuals to purchase more take & eat options such as sliced fruit, pre-made salads, or yogurt. Without the proper insight from the communities, it may not be as easy as the saying goes “if you built it, the will come.” However, corner stores can be successful in selling healthy foods when they have a good relationship with their service community.

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