FOOD ENVIRONMENT: AVAILABILITY AND AFFORDABILITY OF FRUITS, VEGETABLES, AND OTHER HEALTHY FOODS IN GUILFORD COUNTY, NORTH CAROLINA

by

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DEDICATION

This thesis is dedicated to my grandmothers, the late Abena Nipaah Danquah and Akosua Asieduah Bronya. Thank you for all your hard work and scarifies for my father and myself! Grandma Nipaah Danquah, may you rest in peace and may God richly bless Grandma Bronya.

BIOGRAPHICAL SKETCH

Ismail Mintah was born September 21, 1979 in Cape Coast, Ghana. He received the Bachelor of Science Degree in Marketing from Creighton University in Omaha, Nebraska in 2001. He is a candidate for Master of Science degree in Agricultural Economics.

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ABSTRACT

Mintah, Ismail. FOOD ENVIRONMENT: AVAILABILITY AND AFFORDABILITY OF FRUITS, VEGETABLES, AND OTHER HEALTHY FOODS IN GUILFORD COUNTY, NORTH CAROLINA **(Major Advisor: Dr. Kofi Adu-Nyako)**, North Carolina Agricultural and Technical State University.

This study explores the built food environment in terms of food items availability and affordability in different types of stores and neighborhoods in Guilford County. A market basket list generated out of the USDA community food security toolkit was used to collect data on availability and prices of fruits and vegetables from three different stores types (Supermarkets, Grocery Stores, and Convenience Stores) in the county. Availability and affordability comparisons were undertaken by store type and income areas using (ANOVA) with a t-test. In general there were significant differences in availability and affordability of fruits and vegetables between supermarkets and grocery stores, supermarkets and convenience stores, and grocery stores and convenience stores.

Fruits and vegetables availability was higher in supermarkets and lowest in convenience stores. Fruit and vegetables prices tended to be similar and lower in supermarkets and grocery stores, but different and higher in convenience stores. Similar results were obtained for bread and other grain products by store types. Comparison by area income indicate that middle income neighborhoods tended to have the highest foods availability, followed by higher income areas, and then lower income neighborhoods. However, prices of fruits and vegetables and other healthy foods overall were similar between the different income areas in Guilford County. Policies directed at improving the

availability and affordability of fruits and vegetables in smaller type stores and in lower income areas would help increase access to healthy foods.

CHAPTER 1

INTRODUCTION

Overview of Food Environment

Obesity is on the rise in the United States. The National Health and Nutritional Survey in 2009 found that 72.9% of the population in the United States are overweight, obese or extremely obese (Center for Disease Control and Prevention, 2010). An individual is considered obese when their BMI is over 30. What is more alarming about the survey is that people that are over twenty years are now more obese than overweight according to the survey. The obesity epidemic is affecting all states including North Carolina. Trust for America's Health (2011) ranks North Carolina as the tenth most obese state in the nation. Obesity is associated with chronic diseases like high blood pressure, diabetes, stroke and cancer. The economic cost of obesity includes expenditures on healthcare and loss of days of work due to obesity related diseases (Colditz, 1999).

In response to the obesity epidemic, various strategies and interventions are being implemented at the national, state, and local levels to control the rising levels of obesity. Prevention of obesity is achieved from both the dietary and physical activity angles. From the dietary perspectives, for instance, the dietary guidelines from the United States Department of Agriculture (United States Department of Agriculture, 2005) encourages healthy eating by Americans and emphasizes food choices made by individuals. It is recommended that an individual consumes at least five cups of fruits and vegetables per day and also at least half of an individual's grain intake per day must come from whole grain foods.

Over the years, it has increasingly become apparent that the food intake of an individual plays a significant role in facilitating or presenting barriers in terms of health-promoting individual behavior. But consumption of healthy food is low in the United States adult, youth and children population. In 2009 the percentage of adult consuming fruits two or more times per day in the US was 32.5% and percentage of adults consuming vegetables three or more times a day was 26.3% (Center for Disease Control and Prevention, 2009). These consumption numbers were 25% and 27.5% respectively for the state of North Carolina. In addition, in North Carolina only 22% of adult and 15% of youth (9^{th} -12^{th} grade) claim eating fruits and vegetables at least five times per day (Center for Disease Control and Prevention, 2009).

There are a number of factors that may influence consumption of fruits and vegetables including individual preferences, socio demographics factors and the food environment. For example, the type of stores accessible in a community could influence availability and affordability of fruit and vegetables consumption. In addition, availability and affordability of fruits and vegetables may be influenced by income levels and neighborhoods. In the United States there exists a strong residential segregation by race and income. Low income neighborhoods tend to have higher minority population and vice versa for high income areas and food stores available for consumption may differ based on where an individual resides. This study concentrates on the availability and affordability of fruits and vegetables in Guilford County, North Carolina by store types, neighborhood, and income levels.

Problem Statement

Various health conditions are influenced by dietary intake including cancer, diabetes and obesity. The link between energy balance defined as the different caloric intake and energy expenditure is firmly established as the cause of the obesity epidemic that is sweeping the United States. Some individuals in the United States have a positive energy balance because they take in more calories than they expend in a day and that causes overweight and obesity. On the other hand, the beneficial effects of the consumption of less energy dense foods particularly fruits and vegetables is well established, but consumption of these healthful foods is low in the US adults, youth and children population. Why are fruits and vegetables consumption low? A number of factors may influence consumption including availability and affordability. The food environment characterized by food source and their prices may be different in communities and may have differential impact on food thus influencing behavior of consumers. Differences in number and types of retail stores available to consumers within the community, as well as the actual availability of healthful food within the different types of stores, will influence what foods are consumed. Are there differences in availability of healthful food by store types in the Guilford County community? Do prices of healthful food differ by store types? Does neighborhood in the community where one lives influenced by availability and affordability of healthful foods for consumption? These are the questions this study seeks to answer for Guilford County, North Carolina.

Objectives

The specific objectives for this study were:

1. To determine if there are differences in the availability of healthy foods by stores types in Guilford County, North Carolina.

   Hypothesis: Availability of healthy foods is similar for different store types in Guilford County, NC

2. To determine if there are differences in prices of healthy foods in different store types in Guilford County, North Carolina.

   Hypothesis: Prices of healthy foods are similar for different store types in Guilford County, NC

3. To determine if there are differences in availability of healthy foods in different neighborhoods in Guilford Count, NC

   Hypothesis: Availability of foods is similar in different income neighborhoods in Guilford County, NC.

4. To determine if the prices of healthy foods are similar in different income neighborhoods in Guilford County, NC

   Hypothesis: Prices of food items are similar in different income neighborhoods in Guilford County, NC

5. To make recommendations based on the result of this study for policy interventions to improve healthy food consumption.

CHAPTER 2

LITERATURE REVIEW

Conceptual Framework

Healthy food consumption, in particular fruits and vegetables consumption, is influenced by a number of factors including cultural, physical and social environment as well as personal factors (Rasmussen, Krolner, Klepp, Lytle, Brug, Bere, and Due 2006). The cultural environment is defined by the countries socio-economic status, and the income distribution in the country. The physical component addresses the policy implications on consumption of fruits and vegetables at the national level, community level, the school physical environment and perception of the physical environment. For instance, national dietary guidelines may impact school level food policies regarding school meals, prices, and availability. Interaction, between the cultural, physical, social and personal factors, influences individual's decision to consume fruits and vegetables. Recent ecological approaches to public health, has given a prominent role to the influence of the physical food environment in determining food consumption behavior in addition to social and personal factors. The social environment component of food consumption centers on factors that could influence one decision on the consumption of fruits and vegetables at the community level like mass media, schools environment, peer groups and family. The fourth factor, personal factors tackles areas such as individual's knowledge about the need to consume fruits and vegetables, individual attitudes, preferences and habits.

This study focuses on the community level factor of the food environment. For example, the local food access to grocery stores, and in-store availability and prices of fruits and vegetables. In addition, the influence of availability and prices of fruits and vegetables on health behavior in terms of consumption of fruits and vegetables to determine food consumption behavior in addition to social and personal factors. Therefore, the literature review of this study is organized along the following themes: neighborhood food environment accessibility, availability, and affordability. Figure 2.1 below is the conceptual framework of fruits and vegetables consumption.

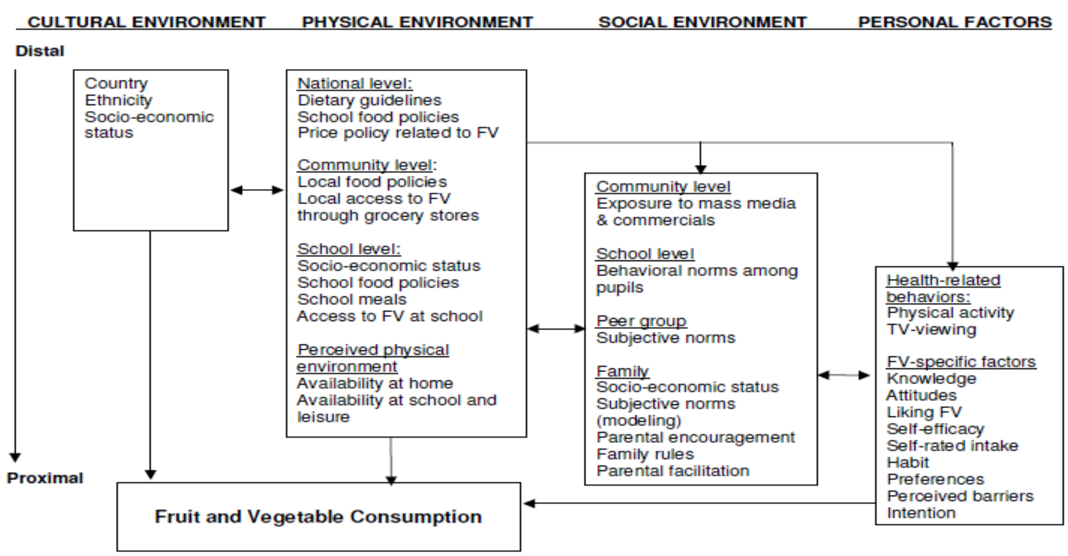

Figure 2.1. Conceptual Framework of Fruits and Vegetables Consumption (Rasmussen et al. 2006).

Food Accessibility

It is well noted from the 1990s that there is a problem of grocery store gap in America. Supermarkets and grocery stores that carry more fruits and vegetables are far less in poor neighborhoods than in more wealthy affluent neighborhoods, while small stores with less fruits and vegetables are increasingly apparent in poor neighborhoods. Morland, Wing, Diez Roux, and Poole, (2002) studied four areas, namely, Jackson City, MS (107 square miles), Washington County, MD (458 square miles), Minneapolis, MN (91 Square miles), and Forest County, NC (410 square miles) with a total study area of 1,066 square miles. They found that there were high concentration of supermarket stores in wealthier residential areas and also high concentration of convenient stores in medium wealthy residential areas. Other studies done in different parts of the country also found similar results in areas like (New York O'Connor and Abell, 1992; Oakland and Los Angeles, California Bell and Burlin, 1993; Shaffer, 2002; Hatfield and Gunnell, 2005; Chicago Alwitt and Donley, 1997; the Twin Cities of Minnesota Chung and Myers, 1999; Detroit Krupa, 2001). Another study designed to contrast two areas with high vs. low-percent African- American Residence within Los Angeles; CA. found that supermarkets were much less frequent in the high minority areas according to Sloane, Diamat, Lewis, Yancey, Flynn, Nascimento, Mc Carthy, Guinyard and Cousineau (2003).

Furthermore, Connell, Yadrick, Simpson, Gossett, McGee, and Bogle (2007) also conducted a study in the Lower Mississippi Delta (LMD) and found that access to supermarkets in the LMD was limited and noted there that were wide disparities in the level of physical access to supermarket in the region between all households and low-income households. In fact they found 70% of all low-income households were located more than 30 miles to a supermarket or large food retailer. It is also evident that in some part of the country there are neighborhoods without a single supermarket store.

According to Pike (2000) in Boston, MA, there is not a single chain supermarket in Boston's predominately African-American neighborhoods like Roxbury, Mattapan, or North Dorchester. This trend also continues nationally where only 52% of chain supermarkets are available in African American neighborhoods compare to White neighborhoods and 32% of chain supermarkets are available in Hispanic neighborhoods compared to White neighborhoods, Powell, Slater, Mirtcheva, Bao, and Chaloupka (2007). These studies above posit that poor neighborhoods are at risk of obesity and overweight due to the food environment accessibility in their neighborhoods.

Food Availability

Availability of fruits and vegetables in the neighborhood food stores is another major contributing factor in the battle of food security in all neighborhoods in America. The lack of competition among the fewer grocery stores that locate in low income neighborhoods usually only lead to higher price, low quality of fruits and vegetables , and fewer variety of food that are considered fresh and healthy choices for consumers. Studies have shown that African Americans living in an area with at least one supermarket are more likely to eat healthy and meet dietary guidelines for fruits and vegetables consumption and for fat intake than African Americans living in areas without a supermarket (Morland et al. 2002; Inagami et al. 2006). Jetter and Cassady (2006) concluded that neighborhoods with smaller, independent grocery stores have less access to whole grain products, low fat cheese, and less than ten percent fat ground meat.

Table 4.3

Availability of Diary Products, Bread and Other Grain Products by Store Type

Food Items	Supermarkets	Grocery Stores	Convenience Stores
	n=30	n=11	n=21
Dairy			
Milk, 1% low fat[a*b*]	100.0	53.9	47.8
Milk, Whole[a*]	100.0	76.9	87.0
Cheese, cheddar, any variety[a*b*]	100.0	23.1	8.7
Cheese cottage, any variety[a*b*c*]	100.0	15.4	0.0
Cheese, mozzarella, whole[a*b*]	100.0	7.7	8.7
Average	**100.0**	**35.4**	**30.4**
Dairy, Canned			
Evaporated milk, any variety[a*b*]	96.7	23.1	39.1
Breads and other Grains Products , Fresh			
Bread White, enriched	96.7	69.2	87.0
Bread, whole wheat[a*b*]	66.7	53.9	60.9
Hamburger Buns Enriched[a*b*]	96.7	38.5	47.8
Rolls, dinner, enriched[a*b*]	83.3	38.5	17.4
French and Italian Bread enriched[a*b*]	73.3	0.0	0.0
Bagels, plain, enriched[a*b*]	83.3	15.4	0.0
Bread crumbs, plain	83.3	0.0	0.0
Average	83.3	30.8	30.4
Breads and other Grains Products, Dry			
Ready to eat Cereal Cornflakes	96.7	61.5	82.6
Ready to eat Cereal Toasted Oats	96.7	38.5	60.9
Flour, White, All-purpose, enriched	96.7	61.5	65.2
Macaroni, elbow-style, enriched	96.7	53.9	43.5
Noodles, yolk-free, enriched	80.0	15.4	4.4
Popcorn, Microwave, any variety (Unpopped)	96.7	46.2	21.7
Rice, White, Long-grain, enriched[b*]	96.7	53.9	47.8
Spaghetti, any variety, enriched[a*b*]	96.7	53.9	52.2
Average	**94.6**	**48.1**	**47.3**

Note. [a]Statistically significant ($P<0.10$) differences between supermarkets and grocery stores.
[b]Statistically significant ($P<0.10$) differences between supermarkets and convenience stores
[c]Statistically significant ($P<0.10$) differences between grocery stores and convenience stores
[8]Statistically significant ($p<0.05$)

Table 4.4

Average Price per Ounce of Dairy Products, Bread and Other Grain Products by Store Type

Food Items	Supermarket		Grocery Stores		Convenience Stores	
	n=30		n=21		n=11	
Dairy	Mean	Std	Mean	Std	Mean	Std
Milk, 1% low fat	0.041	0.015	0.036	0.004		
Milk, Whole	0.041	0.015	0.039	0.010	0.036	0.003
Cheese, cheddar, any variety	0.300	0.068	0.280	0.186	0.393	0.062
Cheese cottage, any variety	0.152	0.038	0.380	0.097		
Cheese, mozzarella, whole	0.312	0.143	0.449		0.474	0.018
Average	**0.169**	**0.056**	**0.237**	**0.074**	**0.301**	**0.028**
Dairy, Canned						
Evaporated milk, any variety[a*b*]	0.084	0.017	0.119	0.013	0.133	0.019
Breads and other Grains Products, Fresh						
Bread White, enriched[b*]	0.077	0.031	0.095	0.030	0.105	0.014
Bread, whole wheat	0.103	0.032	0.098	0.035	0.116	0.018
Hamburger Buns Enriched	0.147	0.137	0.120		0.137	0.036
Rolls, dinner, enriched	0.219	0.012	0.087		0.083	
French and Italian Bread enriched						
Bagels ,plain, enriched						
Bread crumbs, plain	0.134	0.074	0.155			
Average	**0.136**	**0.057**	**0.111**	**0.033**	**0.110**	**0.023**
Breads and other Grains Products, Dry						
Ready to eat Cereal Cornflakes[b*]	0.143	0.053	0.212	0.115	0.323	0.181
Ready to eat Cereal Toasted Oats[b*]	0.168	0.050	0.215	0.112	0.299	0.103
Flour, White, All-purpose, enriched[b*]	0.028	0.010	0.038	0.017	0.053	0.016
Macaroni, elbow-style, enriched[b*c*]	0.069	0.028	0.092	0.039	0.149	0.070
Noodles, yolk-free, enriched	0.113	0.043	0.089	0.073	0.081	
Popcorn, Microwave, any variety (Unpopped)	0.198	0.083	0.241	0.122	0.218	0.137
Rice, White, Long-grain, enriched[b*]	0.054	0.017	0.051	0.016	0.088	0.069
Spaghetti, any variety, enriched[b*c*]	0.071	0.023	0.079	0.038	0.122	0.033
Average	**0.106**	**0.038**	**0.127**	**0.067**	**0.167**	**0.087**

Note. [a]Statistically significant ($P<0.10$) differences between supermarkets and grocery stores.
[b]Statistically significant ($P<0.10$) differences between supermarkets and convenience stores
[c]Statistically significant ($P<0.10$) differences between grocery stores and convenience stores
[8]Statistically significant ($p<0.05$)

Dairy products were more affordable in supermarkets, followed by grocery stores and convenience stores in that order. Dairy prices tended to be higher on average in the smaller type stores. However, these differences were due to the influences of high prices for cheese products, as the prices of milk products were similar among supermarkets and grocery stores which trended on the lower side in prices. Whole wheat bread prices tended to be higher in convenience stores, and similar and relatively lower in supermarkets and grocery stores. The prices differences though were not statistical different. White breads were found to be cheaper in supermarkets, and more expensive in the smaller type stores. Figure 4.1 and 4.2 are maps by store type in the county.

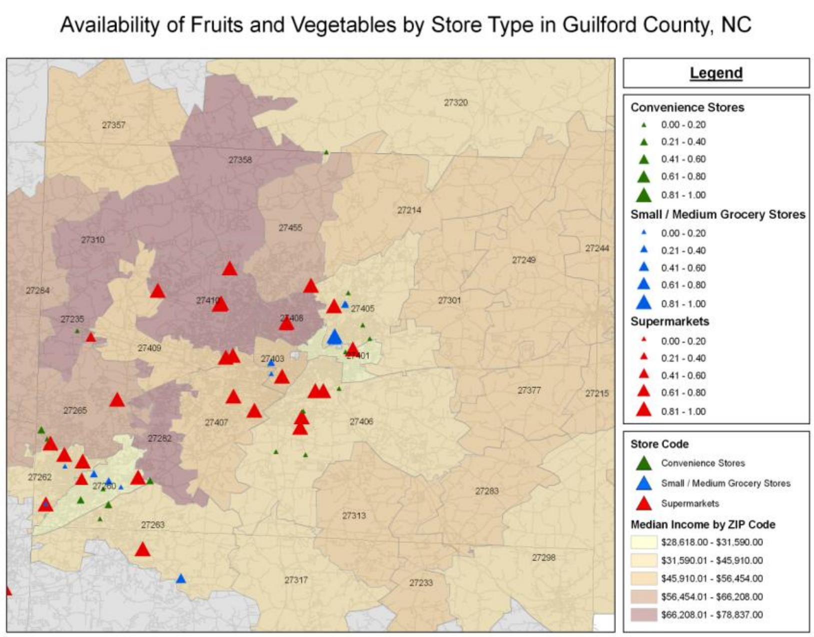

Figure 4.1. Availability of Fruits and Vegetables by Store Type in Guilford County, North Carolina

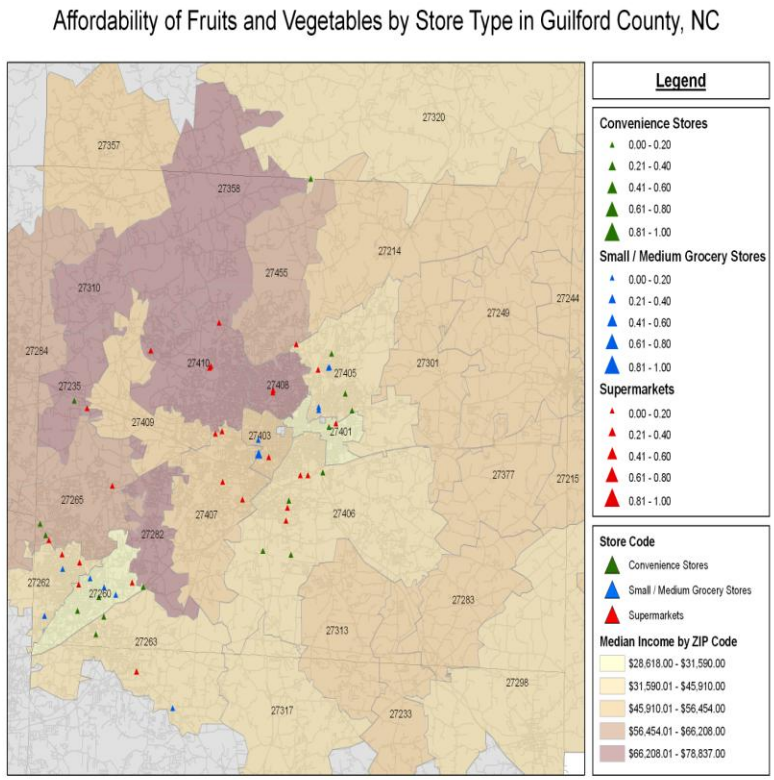

Figure 4.2. Affordability of Fruits and Vegetables by Store Type in Guilford County, North Carolina.

Results by Area Income

Results of this study from Table 4.5 show that overall in Guilford County, middle income neighborhoods tended to have the highest foods availability, followed by higher income areas, and then lower income neighborhoods. Even though differences existed between the various incomes areas, these differences in availabilities were not statistically significant. Only banana, among fresh fruits items recorded a higher availability at low income neighborhood food stores compared to high income area food stores, and peach syrup exhibited the same trend between low are income and medium area income food stores in the county. There existed significant difference between low income area and medium income area neighborhoods on food items such as carrots, green peppers, onions, potatoes, green peas, and canned peas among vegetables. In addition, canned peas availability differed significantly between medium and high income area food stores when comparing the two income areas.

Prices of fruits and vegetables overall from Table 4.6 were similar between the different area income. But regarding individual food items, prices differ between area incomes. For instance, apple, banana, and oranges were higher priced at low income areas stores compared to medium and high income areas food stores. The opposite was the case when comparing between medium income areas and low income areas for the same food items except for orange juice. Carrots and French fries were the only fruits or vegetables that were statistically significant by area income and they are significantly different between medium and high income area food stores. Vegetable prices were similar overall. There were no statistically significant differences between low, medium and high income area neighborhoods in the county. However, the average of all the vegetable prices indicates higher prices at high income areas and lower prices at medium income area food stores. On an individual food item basis there were mixed direction when comparing vegetables prices between the area incomes. For instance, apple was least expensive at high income area compared to low income area food stores. On the contrary, grapes were lower priced at low income area food stores compared to high income area food stores on average.

Table 4.5

Availability of Fruits and Vegetables by Area Income

Food Items	High Income Area n= 18	Medium Income Area n= 7	Low Income Area n= 37
Fruits			
Apple	72.2	71.4	70.3
Banana	72.2	85.7	73
Grape	61.1	71.4	32.4
Melon	55.6	71.4	35.1
Oranges	61.1	85.7	45.9
Carrots[c]	61.1	85.7	40.5
OrangeJuice Concentrate	50	71.4	37.8
Orange Mandarin	72.2	71.4	56.8
Peaches Light Syrup	83.3	71.4	78.4
Average	**65.42**	**76.17**	**52.24**
Vegetables			
Celery	50	71.4	40.5
Green Pepper[c]	55.6	85.7	40.5
Lettuce, Leaf	50	71.4	37.8
Onions[c]	55.6	100	48.6
Tomatoes	61.1	85.7	45.9
Spaghetti Sauce	72.2	71.4	62.2
Tomato Sauce	83.3	71.4	67.6
Broccoli Chopped	55.6	71.4	32.4
Mushrooms	55.6	71.4	40.5
Green Beans	55.6	71.4	35.1
Green Peas[c*]	55.6	85.7	35.1
Peas canned[b*c*]	0	14.3	0
Potatoes[c]	50	85.7	40.5
French Fries	50	71.4	32.4
Apple Juice	100	100	100
Average	**56.68**	**75.22**	**43.94**

Note. [a]Statistically significant (P<0.10) differences between high income and medium income stores.
[b]Statistically significant (P<0.10) differences between high income and low income stores
[c]Statistically significant (P<0.10) differences between medium income and low income stores
*Statistically significant (P<0.05)

Table 4.6

Average Price per Ounce of Fruits and Vegetables by Area Income

Food Items	High Income Area n=18		Medium Income Area n=7		Low Income Area n=37	
Fruits	Mean	Std	Mean	Std	Mean	Std
Apple	0.102	0.020	0.094	0.029	0.109	0.024
Bananas	0.066	0.050	0.039	0.007	0.092	0.072
Grapes	0.155	0.048	0.128	0.035	0.133	0.029
Melon	0.122	0.080	0.061	0.071	0.118	0.093
Oranges	0.085	0.047	0.067	0.015	0.095	0.046
Carrots	0.081	0.050	0.049	0.011	0.066	0.026
Orange Juice	0.186	0.063	0.167	0.050	0.143	0.060
Oranges. Mandarin	0.096	0.031	0.090	0.030	0.096	0.029
Peaches Light Syrup	0.096	0.036	0.080	0.025	0.099	0.035
Average	**0.110**	**0.047**	**0.086**	**0.030**	**0.106**	**0.046**
Vegetables						
Celery	0.128	0.039	0.104	0.033	0.111	0.026
Green Pepper	0.237	0.093	0.163	0.065	0.202	0.058
Lettuce, Leaf	0.149	0.026	0.126	0.025	0.127	0.028
Onion	0.066	0.015	0.099	0.076	0.076	0.053
Tomatoes	0.014	0.058	0.088	0.035	0.101	0.049
Spaghetti Sauce	0.098	0.040	0.073	0.021	0.095	0.054
Tomato Sauce[a]	0.091	0.057	0.047	0.015	0.065	0.031
Broccoli Chopped	0.102	0.030	0.092	0.022	0.096	0.035
Mushroom	0.304	0.065	0.348	0.141	0.287	0.125
Green Beans	0.121	0.024	0.106	0.015	0.097	0.034
Green Peas	0.106	0.020	0.080	0.030	0.079	0.040
Peas Canned	-	-	0.064	-	0.087	-
Potatoes	0.088	0.118	0.042	0.012	0.069	0.092
French Fries[a]	0.077	0.019	0.055	0.008	0.063	0.017
Apple Juice						
Average	**0.122**	**0.046**	**0.106**	**0.038**	**0.111**	**0.049**

Note. [a]Statistically significant ($P<0.10$) differences between high income and medium income stores.
[b]Statistically significant ($P<0.10$) differences between high income and low income stores.
[c]Statistically significant ($P<0.10$) differences between medium income and low income stores.
*Statistically significant ($P<0.05$)

Tables 4.7 and 4.8 depict availability and affordability of dairy products, breads and other grain products (fresh and dry) by area income. In general high and medium income areas were more likely to stock dairy products than low income area food stores. Healthy foods like milk 1% low fat and all cheeses were more available at high and medium income areas food stores compared to low income areas food stores.

Bread and other grain products (fresh), availability differed between area income food stores on an individual food item basis. Whereas, whole wheat bread, and white enriched exhibit highest availability at low income area food stores, hamburger burns enriched were more likely to be stocked at high income area food stores. On the contrary, rolls dinner enriched, and bagel plain enriched were more available at medium income area food stores. Bagels (plain) and bread crumbs (plain) were the only two food items that differed markedly when comparing between area income stores. The statistical difference occurred between low and medium income area food stores respectively.

Food items in general were similarly priced. But bread and other grain product pricing differ between medium and low income areas stores on an individual food item basis. Regarding the price of bread (white enriched), and hamburger burns (enriched), medium income area food stores are the lowest priced compared to high and low income areas food stores. Noodles (yolk free enriched), and rice (white long grain enriched) were the only food items statistically significant, and the differences are between low and high income areas food stores.

Table 4.7

Availability of Dairy Products, Bread and Other Grain Products by Area Income

	High Income Area	Medium Income Area	Low Income Area
Food Items	n=18	n=7	n=37
Dairy			
Milk, 1% low fat	72.20	71.40	67.60
Milk, Whole[b]	100.00	85.70	86.70
Cheese, cheddar, any variety	61.10	71.40	43.20
Cheese cottage, any variety	55.60	71.40	35.10
Cheese, mozzarella, whole	50.00	71.40	40.50
Average	**67.78**	**74.26**	**54.62**
Dairy, Canned			
Evaporated milk, any variety	50.00	71.40	59.50
Breads and other Grains Products , Fresh			
Bread White, enriched	83.40	71.40	89.20
Bread, whole wheat	50.00	42.90	64.90
Hamburger Buns Enriched	77.80	71.40	62.20
Rolls, dinner, enriched	50.00	57.10	45.90
French and Italian Bread enriched	38.90	57.10	24.30
Bagels ,plain, enriched[c]	44.40	71.40	29.70
Bread crumbs, plain[c]	44.40	71.40	24.30
Average	**55.56**	**63.24**	**48.64**
Breads and other Grains Products, Dry			
Ready to eat Cereal Cornflakes	83.30	85.70	81.10
Ready to eat Cereal Toasted Oats	83.30	71.40	62.20
Flour, White, All purpose, enriched	83.30	85.70	73.00
Macaroni, elbow-style, enriched	61.10	85.70	64.90
Noodles, yolk-free, enriched	50.00	57.10	27.00
Popcorn, Microwave, any variety (Unpopped)	61.10	85.70	48.60
Rice, White, Long-grain, enriched	66.70	100.00	62.20
Spaghetti, any variety, enriched	61.10	85.70	70.30
Average	**68.74**	**82.13**	**61.16**

Note. [a]Statistically significant (P<0.10) differences between high income and medium income stores.
[b]Statistically significant (P<0.10) differences between high income and low income stores
[c]Statistically significant (P<0.10) differences between medium income and low income store
*Statistically significant (P<0.05).

Table 4.8

Average Price per Ounce of Diary Products, Bread and Other Grain Products by Area Income

Food Items	High Income Area n=18		Medium Income Area n=7		Low Income Area n=37	
Dairy	Mean	Std	Mean	Std	Mean	Std
Milk, 1% low fat	0.041	0.012	0.053	0.015	0.037	0.011
Milk, Whole	0.040	0.011	0.049	0.016	0.038	0.011
Cheese, cheddar, any variety	0.309	0.107	0.296	0.063	0.280	0.093
Cheese cottage, any variety	0.207	0.123	0.159	0.041	0.151	0.037
Cheese, mozzarella, whole	0.355	0.221	0.251	0.022	0.327	0.117
Average	**0.190**	**0.095**	**0.162**	**0.031**	**0.167**	**0.054**
Dairy, Canned						
Evaporated milk, any variety	0.099	0.016	0.075	0.016	0.103	0.031
Breads and other Grains Products , Fresh						
Bread White, enriched	0.090	0.030	0.074	0.022	0.095	0.028
Bread, whole wheat	0.109	0.035	0.108	0.023	0.106	0.028
Hamburger Buns Enriched	0.186	0.174	0.102	0.024	0.119	0.039
Rolls, dinner, enriched	0.193	0.045	0.230	0.015	0.187	0.070
French and Italian Bread enriched	0.158	0.027	0.137	0.043	0.167	0.049
Bagels, plain, enriched	0.178	0.018	0.171	0.074	0.185	0.079
Bread crumbs, plain	0.131	0.029	0.114	0.037	0.120	0.034
Average	**0.143**	**0.047**	**0.126**	**0.032**	**0.135**	**0.045**
Breads and other Grains Products, Dry						
Ready to eat Cereal Cornflakes	0.206	0.105	0.190	0.099	0.237	0.169
Ready to eat Cereal Toasted Oats	0.199	0.084	0.180	0.063	0.239	0.114
Flour, White, All-purpose, enriched	0.041	0.019	0.028	0.008	0.040	0.018
Macaroni ,elbow-style, enriched	0.089	0.039	0.066	0.011	0.095	0.064
Noodles, yolk-free, enriched[b]	0.130	0.028	0.111	0.036	0.082	0.044
Popcorn, Microwave, any variety (Unpopped)	0.195	0.081	0.154	0.070	0.218	0.103
Rice, White, Long-grain, enriched[b]	0.084	0.066	0.050	0.012	0.053	0.021
Spaghetti, any variety, enriched	0.093	0.024	0.066	0.018	0.086	0.042
Average	**0.130**	**0.056**	**0.106**	**0.040**	**0.131**	**0.072**

Note. [a]Statistically significant (P<0.10) differences between high income and medium income stores.
[b]Statistically significant (P<0.10) differences between high income and low income stores.
[c]Statistically significant (P<0.10) differences between medium income and low income store.
*Statistically significant (P<0.05).

CHAPTER 5

CONCLUSION

Discussion

The results of this study suggested that overall fruits and vegetables and other food items surveyed were significantly available at supermarkets and grocery stores than at convenience stores in Guilford County, North Carolina. In addition, food items on the survey were higher priced when available at convenience stores than at supermarkets and grocery stores on average. Our study also demonstrated that low income area neighborhoods in the county are at the most risk of consuming a healthy diet, due to the lack of availability of fruits and vegetables in stores accessible to them. However, prices of fruits and vegetables and other healthy foods by area income were similar. This finding is consistent with studies from Better Business Bureau of Greater St. Louis Inc., 1968; Chung and Myers, 1999; Morland et al., 2002; Nayga and Weinburg (1999). The lack of fresh fruits and vegetables in low area income in Guilford County, NC appears to be mostly due to lack of availability in food stores in low income area neighborhoods. Majority of the stores that were classified low income area stores through the grouping of the stores based on defined area income were convenience and small grocery stores.

Conclusion

It is well established from previous studies on neighborhood food environment and the findings of this study confirm that healthy foods are available and more affordable in supermarkets than at convenience stores. This study adds to the growing body of evidence demonstrating that low income area residents face a marked disadvantage in terms of consuming fruits and vegetables and other healthful foods. The United Stated Department of Agricultural dietary recommendations are design for every American resident, but our study suggests low income area residents may be at a greater disadvantage in consuming a healthy diet as recommended due to the already built food environment in the county.

Policy Recommendation

Public policies on food environment in Guilford County, NC should examine ways to make fruits and vegetables and other healthy food more available in low income area neighborhoods in the county. Below are a few policies that the researcher recommends to help increase fruits and vegetable consumption in all areas in Guilford County, NC to help intervene on the obesity epidemic sweeping through the county and the state.

Based on the results of this study, there is a need to increase the number of supermarkets in low income area neighborhoods in Guilford County, NC. Increasing supermarkets which carry fruits and vegetables and other healthy foods in low areas income will increase the availability of healthy food for consumption and also decrease prices due to competition among stores in those neighborhoods. One way to encourage supermarkets to operate in low income area neighborhoods in the county is for federal government, state, and local legislative bodies to give tax break to supermarkets and large grocery stores that locate in low income area neighborhoods in the county. A tax policy targeting supermarkets in low income area in the county will make all areas in the county and the state attractive for supermarkets operation, because it will help make up for the difference in profits generated by supermarkets and large grocery stores in high areas income neighborhoods.

A policy that encourages small medium stores and convenience stores to carry more fruits and vegetables is also another way to increase availability of fruits and vegetables in low income area neighborhoods in the county. Based on the results there are a lot more convenience and small medium grocery stores in low areas income in the county. Therefore, it is recommended that law-makers enact a tax policy law that reward small mom and pop and convenience stores that carry fresh fruits and vegetables in their stores all year long.

Another way to increase availability and affordability of fruits and vegetables in the county is by enacting laws that encourage farmer’s market locations in low income area neighborhoods. This could be done by making land space available for farmer’s market operation in all low area income neighborhoods in the county. Farmer’s markets carry fresh fruits and vegetables and other healthy foods. Therefore, by having such markets in low income area in the county, availability of fruits and vegetables will increase in low income area neighborhoods, thus increasing consumption of healthy foods in low income area neighborhoods in the county holding all other factors constant.

Education is a key component to change of behavior by an individual. Regarding healthy food consumption individuals need to be educated about the benefits of consuming fruits and vegetables and other healthy foods. Low income area residents need to be educated on the benefits of fruits and vegetable consumption and on the food stores that carry healthy foods and where those stores are located in the county. There should be public policies in the county aimed at increasing awareness of food and vegetables consumption through advertising and promotional programs in low income area neighborhoods in the county. Such policy will help educate the general public and increase demand for the consumption of healthy food by all residents in Guilford County, NC.

Limitations

This study had some limitations. The researcher used convenience sampling rather than random probability sampling for stores selected to be surveyed. Therefore, the subject of the study may not necessary reflect all the characteristics of the study populations. In addition, this study by design did not assess the availability of non- retail fruits and vegetables such as fruits and vegetables grown in private and community gardens across the county. Furthermore, this study did not take into account the seasonality of fruits and vegetables; therefore, fruits and vegetables that were not in season may be less available and higher priced than during in season.

REFERENCES

Alcaly, R.E., & A.K. Klevorick. (1971). Food prices in relation to income levels in New York City. *The Journal of Business, 44*: 380-97.

Alexis, M., & L.S. Simon.(1967). The food marketing commission and food prices by income groups. *Journal of Farm Economics*, *49*: 436-46.

Algert, S.J., A. Agrawal., & Lewis, D.S. (2006). Disparities in access to fresh produce in low-income neighborhoods in Los Angeles. *American Journal of Preventive Medicine, 30*: 365-70.

Alwitt, L.F., & Donley, T.D. (1997) Retail stores in poor urban neighborhoods. *Journal of Consumer Affairs, 31*: 139–164.

Ambrose, D.M. (1979). Retail grocery pricing: Inner city, suburban, and rural comparisons. *The Journal of Business, 52:* 95-102.

Andrews, M., Kantor, L.S., Lino, M. & Ripplinger, D. (n.d) Using USDA's Thrifty Food Plan to assess food availability and affordability. *Food Review*, *24*: 45–53.

Bell, J. & Burlin, B.M. (1993). In urban areas: Many of the poor still pay more for food. *Journal of Public Policy & Marketing, 12*: 260–270.

Better Business Bureau of Greater St Louis, Inc. (1968). *Comparative study: Food prices and quality practices of major chains in the St. Louis, Missouri metropolitan area.* St. Louis: Better Business Bureau of Greater St Louis.

Center for Disease Control and Prevention. (2009). Defining overweight and obesity. . Retrieved from http://www.cdc.gov/obesity/defining.html

Chung, C. & Myers, S.L. (1999a). Do the poor pay more for food? An analysis of grocery store availability and food price disparities. *Journal of Consumer Affairs, 33*: 276-96.

Colditz, G. A. (1999). Economic costs of obesity and inactivity. *Med. Sci. Sports Exercise, (31)*11 S663-S667.

Connell L. C. Yadrick, M. K., Simpson P., Gossett J., McGee B. B., & Bogle, M. L. (2007). Food supply adequacy in the lower Mississippi delta. *Journal of Nutritional Behavior, 39*: 77-83.

Cotterill, R. & Franklin, A. (1995). The urban grocery store gap. *Food Marketing Policy Center*. University of Connecticut.

Cotterill, R., Rabinowitz, A., & Tian, L. (2002). Milk prices in New England and neighboring areas of New York. Paper presented at the Crisis in Dairy Farming Forum, University of Connecticut, Storrs, CT.

Dixon, D. & McLaughlin, D. (1971). Shopping behavior, expenditure patterns, and inner-city food prices. *Journal of Marketing Research, 8*: 96-9.

Donohue, R. M. (1997). *Abandonment and revitalization of central city retailing: The case of grocery stores*. The University of Michigan DAI-A 58/10 (Abstract).

Ellaway, A & Macintyre, S. (1996). Does where you live predict health related behaviors? A case study in Glasgow. *Health Bulletin, 54*(1), 443-446.

Franco, m., Diez Roux A. V., Glass, T. A., Caballero, B., & Brancati, F. L. (2008). Neighborhood characteristics and availability of healthy foods in Baltimore. *American Journal of Preventive Medicine 6*(53), 561-567.

Goodman, C.S. (1968). Do the poor pay more? *Journal of Marketing, 32*: 18-24.

Haines, G.H., Simon, L.S., & Alexis, M. (1971). The dynamics of commercial structure in central city areas. *The Journal of Marketing*, *35*: 10-8.

Hall, B.F. (1983). Neighborhood differences in retail food stores: Income versus race and age of population. *Economic Geography, 59*: 282-95.

Hatfield, D. & Gunnell, A. (2005). *Food access in California today*. A Vivid Picture Project.

Hayes, R. (2000). *Do the poor pay more? An empirical investigation of price dispersion in food retailing*. Industrial Relations Working Paper No. 446, Princeton Dept. of Econ.

Heany, J. & Hayes, T. (2006). Redlining food: How to ensure community food security. Retrieved from www.foodfirst.org/progs/humanrts/redlining.html.

Helling, A. & David, S. (2003). Race and residential accessibility to shopping and services. *Housing Policy Debate*, *14*: 69-101.

Inagami, S., Cohen, D.A., Finch, B.K., & Asch, S.M. (2006). You are where you shop grocery store locations, weight, and neighborhoods. *American Journal of Preventive Medicine*, *31*: 10-7.

Jetter, K.M. & Cassady, D.L. (2006). The availability and cost of healthier food alternatives. *American Journal of Preventive Medicine, 30*(1), 38-44.

Kasarda, J.D. (1990). Inner-city concentrated poverty and neighborhood distress: 1970 to 1990. *Housing Policy Debate, 4*: 253–302.

Kaufman, P.R., MacDonald, J.M., Lutz, S.M., & Smallwood, D.M. (1997). Do the poor pay more for food? Item Selection and Price Differences Affect Low-Income Household Food Costs. USDA Economic Research Service, ERS No. 759.

King, R.P., Leibtag, E., & Behl, A.S. (2004). *Supermarket characteristics and operating costs in low income areas.* USDA Economic Research Service.

Kolodinsky, J. & Cranwell, M. (2000). The poor pay more? Now they don't even have a store to choose from: Bringing a supermarket back to the city. *Consumer Interests Annual, 46*: 24–9.

Krupa, G. (2001). *Groceries cost more for poor: Dearth of inner-city supermarkets limits choices.* The Detroit News.

Kunreuther, H. (1973). Why the poor may pay more for food: Theoretical and empirical evidence. *The Journal of Business, 46*: 368-833.

Larson, T. (2003). Why there will be no chain supermarkets in poor inner-city neighborhoods. *California Politics and Policy, 7*: 22-45.

MacDonald, J.M. & Nelson, P.E. (1991). Do the poor still pay more? Food price variations in large metropolitan areas. *Journal of Urban Economics, 30*: 344-9.

Marcus, B.H. (1969). Similarity of ghetto and nonghetto food costs. *Journal of Marketing Research, 6*: 365-8.

Moore, L.V. & Diez Roux, A.V. (2006). Associations of neighborhood characteristics with the location and type of food stores. *American Journal of Public Health,* 96: 325-331.

Morland, K., Wing, S., Diez Roux, A., & Poole, C. (2002). Neighborhood characteristics associated with the location of food stores and food service places. *American Journal of Preventive Medicine, 22*: 23-29.

Morland, K., Wing, S., & Roux, A.D. (2002). The contextual effect of the local food environment on residents' diets: The atherosclerosis risk in communities study. *American Journal of Public Health, 92*: 1761-1768.

Nayga, R. & Weinberg, Z. (1999). Supermarket access in the inner cities. *Journal of Retailing and Consumer Service, 6*: 141-145.

NC A&T SU Applied Survey Research Laboratory. (2010). Overall affordability of surveyed items by store type in Guilford County, NC [map]. 1:302,937. ESRI Data [Computer Files]. Greensboro, NC: Using: ArcGIS [GIS software]. Version 9.3. Redlands, CA: Environmental Systems Research Institute, Inc., 1992-1999.

NC A&T SU Applied Survey Research Laboratory. (2010). Overall availability of fruits and vegetables by store type in Guilford County, NC [map]. 1:302,937. ESRI Data [Computer Files]. Greensboro, NC: Using: ArcGIS [GIS software]. Version 9.3. Redlands, CA: Environmental Systems Research Institute, Inc., 1992-1999,

North Carolina Department of Health and Human Services. (2009*). North Carolina has 5th fattest adolescents*. Retrieved from http://www.dhhs.state.nc.us/pressrel/8-27-07.html.

O'Connor, J. & Abell, B. *Successful supermarkets in low income inner cities*. Retrieved from http://www.nal.usda.gov/foodstamp/FOODSTAMPREPORTS/FSP-341.PDF.

Pike, J. (2000). Boston's poor pay more for food, theft and other problems increase business costs, prices." *Massachusetts News,* August 2nd.

Pongracz, P. (2004). *Attracting supermarkets to underserved, urban markets–A case study in a low-income neighborhood of Durham, North Carolina*. Retrieved from http://econpapers.repec.org/paper/wiwwiwneu/neurusp47.htm.

Pothukuchi, K. (2005). Attracting supermarkets to inner-city neighborhoods: Economic development outside the box." *Economic Development Quarterly* 19: 232-44.

Powell, L.M., Slater, S. Mirtcheva, D. Bao, Y. and F.J. ChaloupkaF. J.(2007). Food store availability and neighborhood characteristics in the United States." *Preventive medicine 44*:189-95.

Rasmussen, M., Krolner, R., Klepp, K., Lytle, L., Brug, J., Bere, E. & Due, P. (2006). Determinants of fruits and vegetables consumption among children and adolescents: A review of the literature part 1 quantitative studies. *Journal of Behavioral Nutrition and Physical Activity 3*(22): 14791.

Sexton Jr, D.E. (1971). Do blacks pay more?" *Journal of Marketing Research 8* (1), 420-426.

Shaffer, A. (2010). The persistence of LA's grocery gap." *Center for Food and Justice.*

Sheldon, M., Gans, K. M., Tai, R., George, T., Lawson, E. & Peatlman D. N. (2010). Availability, affordability, and accessibility of a healthful diet in a low- income community, Central Falls, Rhode Island. *Public Health Research, Practice and Policy 7*(2) A43.

Sloane, D. C., Diamat, A. L., Lewis, L. V. B., Yancey, A. K., Flynn, G., Nascimento, L.

M., Mc Carthy, W. J., Guinyard, J. J. & Cousineau, M.R.(2003). Improving the nutritional resources environment for healthy living through community-based participatory research. *J, Gen Intern Med 10*(1046), 568-575.

The Food Trust. (2006). Various reports, 2003-2006. Retrieved from http://www.thefoodtrust.org/.

US Census Bureau. (2009). American fact finder. Retrieved from http://factfinder.census.gov.

U.S. Department of Agriculture (1969). *Comparison of prices paid for selected foods in Chainstores in high and low income areas of six cities* Washington, D.C.: Gov. Printing Office.

U. S. Department of Agriculture (1999). The thrifty food plan. *Washington DC: Center for Nutrition Policy and Promotion.*

U.D Department of Health and Human Services, Department of Agriculture. Dietary Guidelines for America(2005). *Washington DC: U.S. Government Printing Office*

Weinberg, Z. "No Place to Shop (2000). Food access lacking in the inner city." *Race, Poverty, and the Environment.* 22-24.

Wendt, M., Kinsey, J. & Kaufman, P. (2008). Food accessibility in the inner city: What have we learned? A literature review 1963-2007. The food industry center: University of Minnesota.

World Health Organization. (2009). The world health organization's ranking of the world's health systems. Retrieved from http://www.photius.com/rankings/healthranks.html

APPENDIX A

USDA Community Food Security Assessment Toolkit

USDA Community Food Security Assessment Toolkit Food Store Survey Instrument June 2002

Store Name: ,………………………………………………………………

Store Address: ……………………………………………………………….

(Street)

………………………………………………………………………………………………

(City/Neighborhood)	(Zip Code)	
Store ID#: …………	Store Phone#: ………………………	
Store Type: - Supermarket	-Convenience	
-Large grocery	-Gas/grocery	-Other
-Small grocery	-Ethnic/Specialty	

READ THE FOLLOWING TO THE STORE MANAGER BEFORE CONDUCTING THE STORE SURVEY:

Thank you for allowing me to spend some time in your store collecting information on the availability of selected food items and their prices. The information that we are collecting from a wide variety of store in the area will help create a profile of food availability and costs in the community. The information will be only used for this purpose and data collected from all stores will be combined. No data will be liked to any specific store.

TO THE DATA COLLECTOR: Please complete the following table by walking through the store and recording the price and weight of the least expensive item for each food listed. The table includes the unit of measure that should be selected for each food. For example, potatoes are measured in pounds; eggs are measured by the dozen. It is important that the prices recorded are for the specific food item in the table with no substitutions. If a food item is unavailable on the day that you visit the store but is usually in stock, check with the manager for the normal price. If a food is in stock, mark the pricing box with an NA (for Not Available). If a food is on sale, place an “S” next to the price.

Food Item	Brand/ Variety	Item Weight/ Unit(Desired)	Item Weight/ Unit(Actual)	Price (Lowest Cost)
Fruit-Fresh		Per 1b		
Apples, any variety(bagged or loose)		Per 1b		
Bananas		Per 1b		
Grapes (green or red)		Per 1b		
Melon (cantaloupe,honeydew,watermelon)		Per 1b		
Oranges, any variety(bagged or loose)		Per 1b		
Vegetables - fresh				
carrots, unpeeled(bagged or loose)		1-1b bag		
Celery, bunch		Per 1b		
Green pepper		Per 1b		
Lettuce, Leaf(green or red)		Per 1b		
Onions, Yellow(bagged or loose)		Per 1b		
Tomatoes (any variety)		Per 1b		
Potatoes, any variety		5-1b bag		
Fruit, Canned				
Oranges, mandarin(Juice or light syrup)		15-oz can		
Peaches, any variety(light syrup)		29-oz can		
Vegetables - Canned				
Mushrooms, pieces		4-oz can		
Spaghetti sauce, any variety		26-oz jar		
Tomatoes Sauce,(any variety)		8-oz can		

Food Item	Brand/ Variety	Item Weight/ Unit(Desired)	Item Weight/ Unit(Actual)	Price (Lowest Cost)
Fruits and Vegetables, frozen				
Orange Juice, concentrate		12-oz can		
Broccoli, chopped		16-oz bag		
Green beans - any variety		16-oz bag		
Green peas - any variety		16-oz bag		
French fries - any variety		32-oz bag		
Breads, Cereals, and other Grain Products, Fresh				
Bread, white enriched		1-1b loaf		
Bread, all whole wheat		24-oz loaf		
Hamburger bun, enriched		Package of 8		
Rolls, dinner, enriched		package of 12		
French or Italian Bread		Per 1-1b loaf		
Bagels, plain, enriched		Package of 6		
Bread crumbs, plain		10-oz can		
Breads, Cereals, and other Grain Products, Dry				
Ready -to-eat cereal-corn flakes		18-oz box		
Ready -to-eat cereal-toasted oats		20-oz box		
Flour, white, all purpose, enriched		5-1b bag		
Macaroni, elbow-style, enriched		1-1b box		
Noodles, yolk-free, enriched		1-1b bag		
Popcorn, microwave, any variety(unpopped)		9oz package		
Rice, White, Long-grain enriched		5-1b bag		
Spaghetti, any variety enriched		1-1b box		
Dairy Products, Fresh				
Milk, 1% low fat		1 gal		
Milk, Whole		1 gal		
Cheese, Cheddar, any variety		Per 1b		
Cheese, Cottage, any variety		16-oz carton		
Cheese, Mozzarella, whole		16-oz package		
Dairy Products, Canned				
Evaporated milk, any variety		12-oz can		

APPENDIX B

List of Surveyed Stores

Store Name		Address	City	State	Zip Code
Harris Teeter	1589	Skett Club Rd	High Point	NC	27265
Harris Teeter	265	E. Chester Dr	High Point	NC	27262
Compare Foods	800	South Main Street	Lexington	NC	27292
Food Lion	902	West Cooksey Drive	Thomasville	NC	27360
Food Lion	2705	North Main Street	High Point	NC	27265
Food Lion	22	West Chester Drive	High Point	NC	27260
Food Lion	10106	South Main Street	Archdale	NC	27263
Food Lion	1107	East Lexington Ave	High Point	NC	27262
Food Lion	13	Claoniger Suite 1	Thomasville	NC	27360
Super Mart Int. Food	4927	West Market Street	Greensboro	NC	27407
Lowes Food	10106 A	South Main Street	Archdale	NC	27263
Bottom Dollar Food	3136	East Kivette Drive	High Point	NC	27260
Superior Food Supermarket	220	Centennial Street	High Point	NC	27260
Save A Lot	429	Meadowview	Greensboro	NC	27406
Save A Lot	3111	Yanceyville Street	Greensboro	NC	27405
Aldi	2920	Randleman Road	Greensboro	NC	27406
Aldi	4222	High Point Road	Greensboro	NC	27407
Earth Fare	2065	Battleground Ave	Greensboro	NC	27408
Harris Teeter	2369	Lawndale drive	Greensboro	NC	27408
Harris Teeter	4640	West Market Street	Greensboro	NC	27407
Harris Teeter	401	Pisgah Church Road	Greensboro	NC	27455
Harris Teeter	4010	Battleground Ave	Greensboro	NC	27410
Harris Teeter	1605	New Garden Road	Greensboro	NC	27408
Food Lion	120	West Meadowview	Greensboro	NC	27406
Food Lion	2316	East Market Street	Greensboro	NC	27401
Food Lion	3219	South Holden Rd.	Greensboro	NC	27407
Food Lion	3228	Randleman Road	Greensboro	NC	27406
Food Lion	1911	Coliseum Blvd	Greensboro	NC	27403
Lowes Food	1581	New Garden Road	Greensboro	NC	27410
Lowes Foods	6310	Old Oak Ridge Road	Greensboro	NC	27410
Triangle Grocery	1001	Hickory Chapel Road	High Point	NC	27260
Better Deal	8843	USA HWY 311	Archdale	NC	27263
Daniel Brooks Grocery	401	Henley Street	High Point	NC	27260

Big Lots	22	West Chester Drive	High Point	NC	27260
Conrad	6	North Main Street	Lexington	NC	27292
Brentwood Grocery	1804	Wade Place	High Point	NC	27263
Saus Meat Market	1511	Twain Road	Greensboro	NC	27405
Compare Foods (Galaxy)	1040	Summit Ave	Greensboro	NC	27408
VN Montagnard Disc.	3105	Summit Ave	Greensboro	NC	27405
Bessemer Curb Market	932	East Bessemer Road	Greensboro	NC	27405
Alounemay Oriental Market	2601	High Point Road	High Point	NC	27403
Carniceria El Mercedito	2408	Spring Garden Street	Greensboro	NC	27403
Raceway	2907	North Main Street	High Point	NC	27265
Ward Street Grocery	216	West Ward Ave	High Point	NC	27260
Quick Mart	1040	Lexington Ave	High Point	NC	27265
Camp Mart Citgo	3421	North Main Street	High Point	NC	27265
The Popp Shoppe	3512	Kivette Street	High Point	NC	27260
Express Mart	1901	Brentwood Street	High Point	NC	27263
Stop Food Mart	801	Salem Street	Thomasville	NC	27360
Snack Corner	1909	East Green Street	High Point	NC	27260
The Pantry	2608	South Main Street	High Point	NC	27263
Sumner Food Market	4917	Old Randleman Road	Greensboro	NC	27406
4 Brothers Food Stores	1485	HWY 66 South	Greensboro	NC	27284
Kim's Food Mart	2200	Phillip Ave	Greensboro	NC	27405
Higgins Curb Market	3201	East Bessemer Road	Greensboro	NC	27405
John's Curb and Food Market	2000	East Market Street	Greensboro	NC	27401
Citgo Food Mart	8400	Norcross Street	Colfax	NC	27235
Exxon Food Mart	101	Main Street	Kernersville	NC	27235
Jays Grocery	3500	Summit Ave	Greensboro	NC	27405
T&S Asian & American Food	2806-A	Randleman Road	Greensboro	NC	27406
Kim's Grocery	4051	Randleman Road	Greensboro	NC	27406
The Pit Stop(Alamance Food Market)	1061	Alamance Church Rd.	Greensboro	NC	27406
Reds Curb Market	3601	N. Church Road	Greensboro	NC	27455