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Health & Place

journal homepage: www.elsevier.com/locate/healthplace

Short report

A farmers' market in a food desert: Evaluating impacts on the price and availability of healthy food

Kristian Larsen^{a,1}, Jason Gilliland^{b,*}^a University of Toronto, Department of Geography and Planning, St. George Campus, Sidney Smith Hall, 100 St. George Street, Toronto, Ontario, Canada M5S 3G3^b The University of Western Ontario, Department of Geography, Social Science Centre, Rm 1403, 1151 Richmond Street, London, Ontario, Canada N6A 5C2

ARTICLE INFO

Article history:

Received 3 February 2009

Received in revised form

16 June 2009

Accepted 22 June 2009

Keywords:

Food desert

Farmers' market

Neighbourhood health

Food access

ABSTRACT

Several studies have examined supermarket access for low-income residents, but few have explored how access to healthy food changes when a new food retailer such as a farmers' market opens in a place previously known as a 'food desert'. This paper uses a 'before and after' approach to examine the impact of the introduction of a farmers' market on the price and availability of healthy food in an underserved urban neighbourhood. The farmers' market had a major impact on grocery prices in the neighbourhood, which decreased by almost 12% in 3 years.

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1. Background

Recent studies have identified socially distressed neighbourhoods with poor access to healthy food as 'food deserts' (Weinberg, 2000; Larsen and Gilliland, 2008). When healthy foods like fruits and vegetables are not locally available, many people shop at 'convenience' stores where food is typically more expensive and less healthy (processed, higher in fats and sugars) (Latham and Moffat, 2007). Food deserts have emerged as a critical public health issue, as a healthy diet is linked to reduced risk of many chronic diseases, including heart disease, stroke, hypertension, type 2 diabetes, and certain cancers (Must et al., 1991; Segal et al., 1994; White, 2007; Health Canada, 2007). While several studies have examined supermarket access for low-income households, few have explored the impact of opening a new food retailer in an underserved area (Cummins et al., 2005a). The purpose of this paper is to examine the impact of a new farmers' market on the price and availability of healthy food in a food desert.

1.1. The existence of food deserts and costs to residents

The existence of food deserts in the US, UK, and Canada has been highly debated (Cummins and Macintyre, 2002a; Shaw,

2006; Apparicio et al., 2007). In the US, low-income, minority-dominated urban neighbourhoods are often considered as food deserts, as supermarkets have vacated these communities (Alwitt and Donley, 1997; Weinberg, 2000; Eisenhauer, 2002; Morland et al., 2002). Conversely, no clear relationship has been found between household income and food access within the UK (Cummins and Macintyre, 2002b; Cummins et al., 2005b).

Findings on food deserts in Canadian cities are mixed. Our previous work in London, Ontario discovered the presence of food deserts in low-income, inner-city neighbourhoods, namely Central London and 'Old East' (Larsen and Gilliland, 2008). A study examining access to fruits and vegetables in Montreal discovered 40% of residents without an automobile had poor access to fresh produce (Bertrand et al., 2008); however, Apparicio et al. (2007) claimed that food deserts were 'missing' from Montreal. Research on Edmonton, Alberta, found low-income urban neighbourhoods had the best access to supermarkets (Smoyer-Tomic et al., 2006).

It is widely agreed that residents pay more for groceries in areas with poor supermarket access; healthy foods like fruits and vegetables are scarcer and prices are higher at smaller retailers than at supermarkets (Sooman et al., 1993; Barratt, 1997; Kayani, 1998; Chung and Myers, 1999; Latham and Moffat, 2007). Consequently, recent studies have suggested that supermarket access translates into better diets and health, while greater exposure to fast food restaurants promotes unhealthy eating and obesity-related health problems (Reidpath et al., 2002; Morland et al., 2002; Zenk et al., 2005). While the majority of studies have been conducted in the US or UK, more research is needed to determine how food access impacts residents of Canadian cities.

* Corresponding author. Tel.: +1 519 661 2111x81239; fax: +1 519 661 3750.

E-mail addresses: kristian.larsen@utoronto.ca (K. Larsen), jgillila@uwo.ca (J. Gilliland).¹ Tel.: +1 519 788 3941; fax: +1 416 946 3886.

1.2. Study area: Old East and the London farmers' market

The research was performed in London, Ontario, Canada—population 350,000 (StatCan, 2006). Research in 2005 examined food access in London and identified Old East as a food desert (Fig. 1) (Larsen and Gilliland, 2008). Old East is an inner-city neighbourhood with 10,499 residents, with a low median household income (\$40,156) compared to the city average (\$62,143) (StatCan, 2006). The commercial spine of Old East, Dundas Street, contains a high density of social service agencies, 'creative' venues (artist studios, theatres, and a renowned performance hall), and an eclectic retail mix (pawn shops, used furniture shops, and alternative bookstores). Besides restaurants and cafes, food retailing is limited to a few small 'convenience' stores (none are 'chains'). Convenience stores also occupy several street corners within the residential areas of the neighbourhood.

In December 2006, the London Farmers' Market opened in Old East, filling the Confederation Building (56,000 ft²) of the Western Fair. Approximately 50 vendors sell items such as fresh fruits and vegetables, dairy products, meats, poultry, fish, dry goods, baked goods, eggs, herbs, coffee, and prepared meals; another 50–60 vendors sell non-food items such as flowers, natural cosmetics, and antiques (London Farmers' Market (LFM), 2009). According to farmers' market owner David Cook, about half of the food vendors can be considered 'producers' and half 'brokers' (personal communication, May 13, 2009). Given the short local growing season, brokers bring in non-local items from food terminals in order to provide a range of produce year round. The farmers' market is open every Saturday, 7 a.m.–3 p.m.; however, the owner intends to expand the hours and days of operation. This paper examines the impact of the farmers' market on the price and availability of healthy food in an underserved neighbourhood. Our hypothesis is that the introduction of a farmers' market will increase the availability of fresh produce and reduce the overall cost of filling an 'Ontario Nutritious Food Basket' (ONFB).

2. Methods

2.1. Database of food retailers

A spatially referenced London food retailer database was created for 2005 and 2008 from business directories (Vernon's City Directory, 2005; Vernon's City Directory, 2008) and verified against the food inspector's database, telephone directories, websites, and site visits. Data were geo-coded within ArcGIS 9.1 and locations were verified against aerial photography. Datasets were mapped to locate food retailers and assist with pricing of food.

2.2. Pricing of a healthy food basket

To assess temporal variations in the price of food throughout London, a two-stage field survey was completed for two different periods: 2005 and 2008. The first stage assessed the average cost of filling an ONFB—66 items from all four food groups—at supermarkets across the city. The ONFB is a tool that measures the price and availability of nutritious food (Health Canada, 1998; Nathoo and Shoveller, 2003; Latham and Moffat, 2007). The second stage assessed the cost of filling an ONFB in an area without a supermarket (Old East).

In October 2005, every item in the ONFB was priced at 11 of the 28 supermarkets throughout the city. Selected stores comprised relevant samples for both urban and suburban locations, and neighbourhoods of contrasting incomes. To consider price variations between supermarket chains, a combination of full-service (e.g., Loblaws, Metro) and self-service (e.g., No Frills, Price Chopper) stores was surveyed. A standard pricing protocol was followed; only lowest price items (including sale items) were used in the calculations. This process was replicated in 2008 to determine how the prices of groceries changed. Only 10 of the 11 supermarkets were priced in 2008, as one store had since closed.

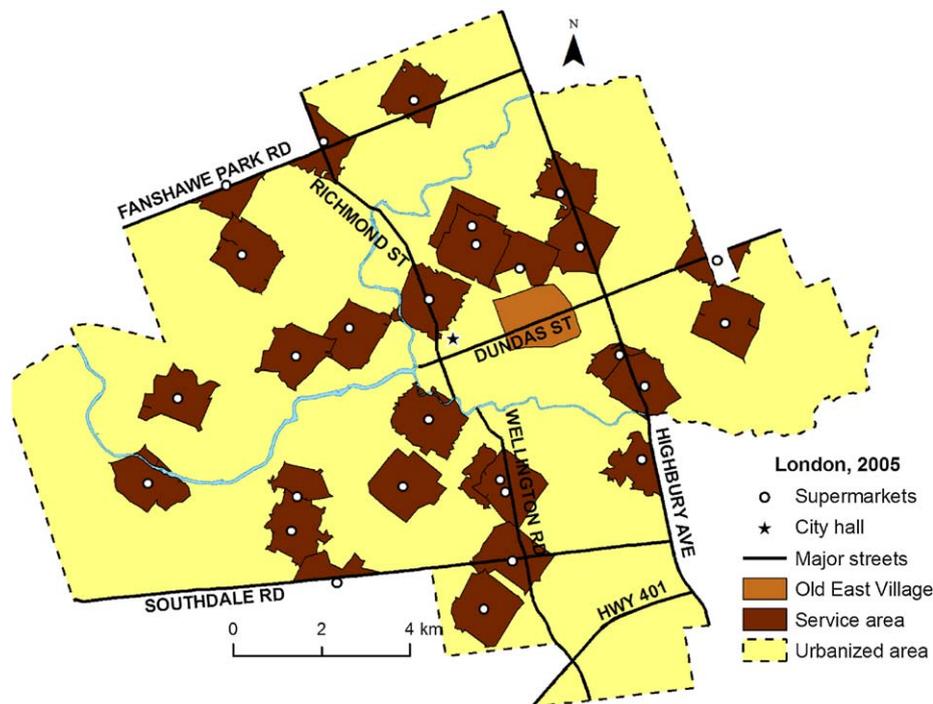


Fig. 1. London supermarket accessibility within 1000 metres and location of Old East Village 'food desert', 2005.

ONFB pricing was also completed in a food desert by visiting every retailer in Old East. Only the lowest price of each item was retained for analysis. In 2008, the process was repeated in Old East, starting at the farmers' market (where the majority of items were found), and then surveying every other retailer until every ONFB item was found. Convenience stores were the other food retailer predominantly available in Old East.

2.3. Data entry

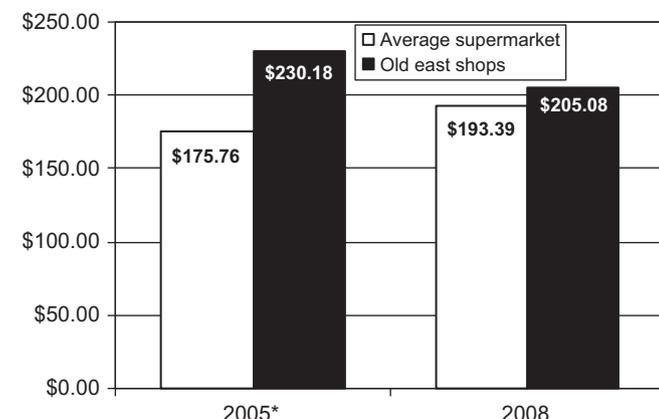
Price data were entered into a spreadsheet for analysis and, if necessary, adjusted by quantity. For example, if carrots were only found in 1 kg bags, the price was multiplied by 1.36 to equal the desired quantity (1.36 kg). The average (mean) price was then taken from the 11 supermarkets in 2005 and 10 in 2008 for comparison with prices in the food desert. To control for changes in the value of a dollar, 2005 figures were raised by 6.12% to the 2008 value (Bank of Canada, 2008).

3. Results

3.1. Influence of a farmers' market on price and variety of food

The average price of a healthy food basket (ONFB) at supermarkets within London has increased by 9.12% (\$17.63) over 3 years (after controlling for inflation) (Fig. 2), mostly due to increased prices of rice, certain produce, canned fish, and wheat products (Table 1). While supermarket food prices have gone up, grocery shopping in the Old East food desert is now less expensive (Fig. 2). In 2005, an ONFB in Old East cost \$230.18, while in 2008 the price dropped by 12.2% to \$205.08 (Fig. 2). As highlighted in Table 1, the farmers' market offered reductions in the price of certain meats, cheeses, and produce. In 2005, shoppers in the food desert paid an average of \$54.42 more than residents who bought food at a supermarket. By 2008, it only cost an extra \$11.69 to fill the ONFB in Old East compared to the average London supermarket prices.

While in 2005, green grapes, celery, and broccoli were not available at any of the retailers in Old East, every food on the ONFB list was found in 2008. This is particularly important as fresh produce is often unavailable in a food desert. Since fruits and vegetables are an essential part of a healthy diet, access to fresh produce is necessary for good health.



* 2005 prices adjusted by 6.12 percent to account for inflation

Fig. 2. Change in price of a healthy food basket from 2005 to 2008.

4. Discussion

The introduction of the farmers' market has had a major impact on the overall price of groceries in Old East. In 2005, residents who purchased groceries locally in Old East typically would have paid 23.6% more than Londoners who shopped at a supermarket. Other Canadian studies have shown that foods are more expensive at small food retailers (Latham and Moffat, 2007). Added expenses for food can create financial constraints for low-income populations. A recent study indicated that only 54% of households in the most socially distressed neighbourhoods in London had access to a private automobile (Luciani, 2005). Since many residents of Old East neither has an automobile nor has easy access to a supermarket by public transit (Larsen and Gilliland, 2008), improved access to healthy food via the farmers' market has likely improved some household diets. ONFB prices have dropped by \$25.10 or \$652.60 per year—supposing residents fill the ONFB bi-weekly. Considering that the average monthly rent in East London is \$650 (Canada Mortgage and Housing Corporation (CMHC), 2008), this savings represents a major impact on the household budget.

In addition to offering lower prices, the farmers' market improved access to healthy food items, for example, broccoli, green grapes, and celery are now available in Old East. The market provides residents with a significantly better variety of food items, which is arguably an important aspect of a healthy diet. Given the striking improvements in the price and availability of healthy foods in the neighbourhood, we argue that Old East is no longer a food desert.

One drawback of the farmers' market is that it is only open on Saturdays from 7 a.m.–3 p.m., meaning residents are limited as to when they may shop; however, plans are under way to expand hours/days of operation. Nevertheless, farmers' markets are not meant to replace supermarkets; they do, however, provide a healthy and sustainable alternative to the standard supermarket by reducing food miles and allowing residents to 'eat fresh' and support local farmers. Research by Feagan et al. (2004) found residents were committed to supporting local farmers' markets as a means to obtain local produce and support the nearby agricultural community.

5. Conclusion

This study demonstrated that the introduction of a farmers' market in a food desert increased the availability of healthy food and lowered the overall food costs for households in the neighbourhood. Since the introduction of the farmers' market, residents living in Old East can save over 12% and are now only paying 5.7% more than average supermarket prices. The farmers' market also gives residents a better variety of fresh fruits and vegetables. Food access among residents is significantly better now than 3 years ago. We argue that Old East is no longer a food desert.

This study does not suggest everyone in the neighbourhood shops at the farmers' market; rather, that a cost-saving opportunity is now available. The fact that this research examined food access at a scale smaller than supermarkets is a significant academic contribution. While most food desert studies have examined access to supermarkets, few have identified how other food retailers can influence life in a food desert. This study has additionally included an innovative 'before and after' approach to assessing food price and availability. The findings indicate that the introduction of a farmers' market can significantly decrease the economic costs of living in a neighbourhood without a supermarket. These findings have policy implications for planners and

Table 1
Price of a healthy food basket: average supermarket price vs price in food desert.

Item and quantity	Average supermarket		Old East shops	
	2005	2008	2005	2008
2% milk (2l)	\$3.72	\$3.80	\$4.13	\$3.99
Yoghurt (12 × 125 ml)	\$4.80	\$5.03	\$6.36	\$5.15
Medium cheddar (600 g)	\$6.52	\$6.76	\$12.14	\$7.92
Processed cheddar cheese slices (500 g)	\$3.67	\$3.98	\$4.76	\$4.99
Partly skimmed mozzarella (600 g)	\$7.59	\$7.29	\$12.14	\$7.80
Vanilla ice cream (2l)	\$2.92	\$3.05	\$6.36	\$4.79
Round steak (kg)	\$12.63	\$12.79	\$9.33	\$14.31
Stewing beef (kg)	\$11.47	\$11.11	\$7.69	\$8.79
Regular ground beef (kg)	\$6.45	\$7.20	\$7.42	\$5.48
Pork loin chops (kg)	\$11.34	\$12.39	\$7.69	\$7.15
Chicken legs (no back) (kg)	\$5.13	\$6.70	\$3.01	\$3.28
Sliced cooked ham (100 g)	\$1.10	\$1.32	\$2.11	\$1.00
Frozen fish fillets (cod/haddock) (400 g)	\$3.17	\$3.21	\$6.25	\$4.41
Canned pink salmon (each)	\$1.50	\$2.07	\$2.11	\$2.39
Canned flaked light water packed tuna (each)	\$1.08	\$1.50	\$1.48	\$1.79
Large eggs (carton)	\$2.31	\$2.26	\$2.96	\$2.50
Canned baked beans in tomato sauce	\$0.73	\$0.85	\$1.26	\$1.59
Dried navy beans (450 g)	\$0.99	\$1.13	\$1.48	\$1.33
White pea beans (907 g)	\$2.39	\$2.59	\$1.48	\$1.33
Peanut butter (1 kg)	\$3.48	\$4.01	\$4.76	\$1.99
White bread (loaf)	\$1.59	\$1.81	\$1.69	\$1.79
Whole wheat bread (loaf)	\$1.70	\$1.99	\$2.11	\$2.25
Hot dog/hamburger buns (8 buns)	\$1.75	\$2.15	\$2.46	\$1.67
All purpose flour (2.5 kg)	\$2.88	\$3.75	\$5.30	\$5.99
Whole wheat flour (2.5 kg)	\$3.30	\$3.94	\$6.35	\$5.99
Dry macaroni or spaghetti (900 g)	\$1.19	\$1.62	\$1.69	\$2.39
Long grain white rice (2 kg)	\$2.95	\$3.93	\$6.20	\$5.39
Macaroni and cheese dinner	\$0.63	\$0.85	\$1.05	\$0.79
Regular cooking oatmeal (1 kg)	\$2.24	\$2.17	\$3.17	\$3.99
Salted soda crackers (450 g)	\$1.48	\$1.67	\$3.17	\$1.99
Social tea cookies (350 g)	\$2.05	\$2.67	\$5.50	\$3.69
Corn flakes cereal (750 g)	\$3.28	\$2.87	\$2.11	\$4.99
Shreddies cereal (620 g)	\$3.75	\$3.70	\$4.55	\$4.99
Oranges (454 g)	\$1.11	\$1.00	\$1.05	\$0.99
Canned apple juice (1.36l)	\$1.08	\$1.06	\$1.79	\$1.69
Frozen orange juice concentrate (each)	\$1.02	\$1.33	\$1.26	\$1.69
Tomatoes (454 g)	\$1.26	\$1.67	\$1.48	\$1.00
Canned whole tomatoes (each)	\$1.00	\$1.06	\$1.37	\$1.59
Canned tomato juice (1.36l)	\$1.20	\$1.18	\$2.85	\$1.99
Potatoes (2.268 kg)	\$2.57	\$2.84	\$3.17	\$1.00
Frozen French fried potatoes (1 kg)	\$1.54	\$1.57	\$2.11	\$2.79
Pears (454 g)	\$1.30	\$1.18	\$1.05	\$0.99
Green grapes (454 g)	\$2.12	\$2.54	\$2.12 ^a	\$1.99
Canned fruit cocktail (398 ml)	\$1.53	\$1.34	\$1.69	\$2.29
Bananas (454 g)	\$0.60	\$0.71	\$1.05	\$0.69
Macintosh apples (454 g)	\$1.05	\$0.91	\$2.11	\$0.60
Sultana raisins (375 g)	\$2.02	\$2.49	\$3.17	\$2.49
Iceberg lettuce (each)	\$1.18	\$1.73	\$1.37	\$1.50
Romaine lettuce (each)	\$1.33	\$2.00	\$1.58	\$1.50
Frozen mixed vegetables (1 kg)	\$2.39	\$2.48	\$3.07	\$2.99
Canned corn (341 ml)	\$0.81	\$0.96	\$1.16	\$1.49
Canned peas (398 ml)	\$0.85	\$0.98	\$1.37	\$1.69
Broccoli (bunch)	\$1.40	\$1.92	\$1.40 ^a	\$1.50
Cabbage (each)	\$1.09	\$1.13	\$1.79	\$1.50
Carrots (1.36 kg)	\$1.52	\$1.53	\$5.74	\$1.50
Celery (each)	\$1.33	\$1.69	\$1.33 ^a	\$1.25
Field cucumber (each)	\$0.86	\$1.19	\$1.05	\$0.75
Onions (1.36k g)	\$1.77	\$2.18	\$2.11	\$1.50
Green pepper (454 g)	\$1.37	\$1.77	\$1.48	\$0.99
Rutabagas (each)	\$1.01	\$1.06	\$3.70	\$1.50
Margarine (454 g)	\$1.12	\$1.37	\$2.11	\$2.59
Butter (454 g)	\$3.65	\$3.67	\$4.76	\$4.49
Canola oil (3l)	\$6.12	\$7.38	\$7.57	\$7.99
Mayonnaise-type salad dressing (950 ml)	\$2.57	\$2.60	\$3.81	\$3.99
White sugar (2 kg)	\$2.12	\$1.97	\$3.17	\$2.99
Strawberry jam (500 ml)	\$2.12	\$2.75	\$5.07	\$3.69
Total cost	\$175.76	\$193.39	\$230.18	\$205.08

Bold italics are used to denote items that were found at the farmers market and the lowest price available.

Source: Ontario Nutritious Food Basket (Health Canada, 1998). Price data from author field surveys 2005; 2008.

^a Denotes item not available in 2005, therefore average supermarket price used for comparison.

public health managers concerned with improving the health of urban populations.

Acknowledgements

This research was supported by the Academic Development Fund of The University of Western Ontario (PI: Jason Gilliland). Certain GIS data were provided by the City of London Planning Department. The authors would like to thank Darlene Balandin, Sekoia Johnson and Eric Simard for assistance with the pricing of the ONFB, and Richard Sadler for comments on the draft. We also thank David Cook for providing details on the London Farmers' Market.

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