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Research report

Overcoming challenges to effectiveness of mobile markets in US food deserts

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ARTICLE INFO

Article history:

Received 18 December 2013

Received in revised form 14 March 2014

Accepted 25 March 2014

Available online 13 April 2014

Keywords:

Food access

Fruits and vegetables

Low-income households

Public health

ABSTRACT

The purpose of this research is to investigate whether mobile food markets may be effective in facilitating healthy food choices in food deserts. We investigate who does and does not use mobile food markets and why, and whether mobile markets have the potential to alter attitudes and food choices, and if so, how? We use a focus group study at four sites in the US to ask groups of mobile market shoppers and non-shoppers about their shopping, cooking, and eating attitudes and behaviors. We find that mobile market shoppers eat significantly more servings of fruits and vegetables, however, both shoppers and non-shoppers perceive fruits and vegetables as luxury items, and both groups lack knowledge about what is a serving and what is the recommended number of servings per day. Both groups identified the following needs for mobile markets to be more successful: increased awareness and advertising; affordability; improved convenience by offering more stops and hours, as well as greater variety of items for one-stop shopping; emphasis on value and service; and building trust within communities.

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Introduction

We know more about nutrition than at any time in history (Tillotson, 2004), yet more than half of US adults are overweight (Flegal, Carroll, Ogden, & Curtin, 2010) and preventable nutrition-related diseases (heart disease, stroke, and type II diabetes) are implicated in over one-third of all deaths in the US (Xu, Kochanek, Murphy, & Tejada-Vera, 2010). As a result, the US medical costs for obesity alone in 2008 were US\$147 billion (Finkelstein, Trogon, Cohen, & Dietz, 2009).

Economic theory might point to low prices of unhealthy foods as an explanation of overeating. US consumers spend less than 8% of household expenditures on food at home (US Bureau of Labor Statistics, 2011), the lowest percentage of any country, at any time in history. However, a review of research on the influence of fiscal policies on eating behavior shows that the empirical evidence is weak and of low quality (Thow, Jan, Leeder, & Swinburn, 2010). Further, experimental data indicates “fat taxes” have little impact on eating behavior, while subsidies of healthy foods are costly; a 1% subsidy on fruits and vegetable would cost the US\$1.3 million per life saved (Cash & Lakanilao, 2007).

Who is most affected by nutrition-related illness in the US offers clues about their causes; in a study on low-income shoppers, obesity and chronic disease are associated with low fruit and vegetable consumption (Leone et al., 2012). Furthermore, in the US, African-Americans and Hispanics are more likely than Whites to be obese, and poverty significantly increases the likelihood of all racial and ethnic categories of women to be obese (Ogden, Lamb, Carroll, & Flegal, 2010). Poverty is concentrated in both urban and some (not all) rural areas of the US (US Census Bureau, 2013b). Story, Kaphingst, Robinson-O'Brien, and Glanz (2008) and Mead (2008) point to the urban built environment as affecting access to fresh foods, while Gantner, Olson, Frongillo, and Wells (2011) identify similar problems of access to healthy foods in rural areas of the US. Indeed, the US Department of Agriculture defines a “food desert” as communities where the poverty rate is greater than 20% and at least one-third of the inhabitants live at least one mile from a grocery store (10 miles in rural communities).

However, research on food deserts has yielded mixed results regarding the links between food access, or the built environment, and health outcomes (Caspi, Sorensen, Subramanian, & Kawachi, 2012; Feng, Glass, Curreiro, Stewart, & Schwartz, 2010; Walker, Keane, & Burke, 2010). In part, this may be due to the fact that different researchers define food desert differently, often focusing on distance to grocery stores unlike the US Department of Agriculture, which incorporates poverty as well. For example, An and Sturm (2012) did not find a strong correlation between children's food

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environment, defined as density of fast food and stores within 0.5 miles of their home or school, and diet of children in California. Caspi et al. (2012) reviewed 38 studies on food environment, concluding that store distance does not appear to be correlated with dietary choices. Feng et al. (2010) review 63 papers and conclude that there is not strong evidence that the built environment is linked to obesity in the US. In a review of 31 papers on food deserts in the US, Walker et al. (2010) find mixed results about the linkage between food access and food choices, concluding that income is often the limiting factor; this points to the importance of including poverty in the definition of a food desert. Caspi et al. (2012) and Feng et al. (2010) emphasize that the variety of methodologies and measurements are problematic in making comparisons between studies, while Cummins and Macintyre (2002) point to problems with the research design of many food desert studies, and in particular, the assumption of causality when variables are merely correlated.

Some researchers also contest the relationship between poverty and food. Looking at the UK, Wrigley (2002) found mixed results about food access in poor neighborhoods. In the US, Widener, Farber, Neutens, and Horner (2013) use commuting data in Cincinnati to show that there is greater food access if one takes into account commuting behavior rather than merely using the location of one's residence. Another US study found a link between race and food access; Powell, Slater, Mirtcheva, Bao, and Chaloupka (2007) found predominantly African-American and Hispanic neighborhoods had fewer chain supermarkets than White neighborhoods even when they controlled for income.

Despite the contested research findings, there is often an assumption, particularly among policy makers, that improving food access in food deserts will yield better health outcomes (Cummins & Macintyre, 2002; Wrigley, 2002). As a result, several nonprofit organizations in the US are trying to mitigate the issue of food access by creating mobile food markets in low income, low food access communities (Sifferlin, 2012). Mobile markets in the form of buses, trucks, or semi-trailers outfitted with refrigeration, cash registers, credit and electronic transfers retailing equipment are a lower cost alternative to establishing brick-and-mortar stores in these communities. In fact, one of the earliest mobile markets, People's Grocery's mobile market in Oakland, California, was founded due to lack of funding for a brick-and-mortar store in 2003. Later a brick-and-mortar store opened in the area originally served by a mobile market (Community Commons, 2012). However, since mobile markets are a recent phenomenon, studies about them are scarce. We do not know whether mobile markets are effective in delivering fresh produce to food deserts. Furthermore, while mobile markets appear to be a stopgap measure to improve access to healthy foods, the nonprofits operating mobile markets have a variety of missions. Some explicitly have long-term goals, such as: creating demand for local agricultural products, providing nutrition education programs, or promoting food justice (e.g. Arcadia Center for Sustainable Food and Agriculture, 2014; Gorge Grown Food Network, 2014), implying that for them mobile markets are part of a long-term strategy.

Studies of mobile markets are not only limited, they also have mixed results. Widener, Metcalf, and Bar-Yam (2012, 2013) show that while both brick-and-mortar stores and mobile markets lead to increases in fruit and vegetable consumption, mobile markets have the advantage of covering a larger area. While this addresses accessibility, affordability still remains a problem. This might explain the contradictory findings about mobile markets and fruit and vegetable consumption. Tester, Yen, and Laraia (2012) find that the presence of a mobile fruit vendor increased children's consumption of produce and reduced their consumption of unhealthy snacks over a 14-day study. However, Philadelphia Greensgrow Project (2012) finds only modest increases in farms sales and use of mobile markets by targeted communities. Obstacles in reaching their intended customers are related to timing, lack of variety, and lack of advertis-

ing. Abusabha, Namjoshi, and Klen (2011) show a modest increase in vegetable consumption by seniors (from 2.0 to 2.6 servings per day, mostly in terms of potatoes); however, consumption of fruit was unaffected. Measuring the effect of mobile markets on personal health, Lewis and Zollinger (2012) show that despite the reported modest increase in fruit and vegetable consumption among regular mobile markets shoppers, personal health (defined in terms of obesity, blood pressure, and blood sugar) remained unaffected over the six-month study period. However, participants perceived their health to have improved. In addition, the authors discuss other benefits of mobile markets, specifically, that they facilitate community gathering and provide information and tools to improve eating habits.

Despite a lack of information and supportive research findings, mobile markets continue to spring up around the US as a strategy to provide healthy food choices in food deserts (The National Mobile Market, 2013) with some of them receiving funds from federal agencies. The US Department of Agriculture (USDA) Agricultural Marketing Service (AMS) funded two mobile markets through cooperative agreements in 2011 to provide urban and rural food deserts with access to fresh, healthy food (US Department of Agriculture, 2012). Through the Farmers' Market Promotion Program, USDA AMS also funded competitive grants to 14 mobile market projects in 2012, 13 in 2011, and 4 others since 2008 (Agricultural Marketing Service, 2013).

Therefore, the goal of this study is to investigate whether mobile food markets are effective in facilitating healthy food choices in their communities. The objectives of the research are to: (1) understand who does and who does not use mobile markets and why, and (2) investigate whether mobile produce markets have the potential to alter attitudes and food choices, and if so, how.

We build on research that examines access to food as one of the key contextual factors impeding healthy food choices. Mead (2008) and Block, Chavez, Allen, and Ramirez (2012) found that low food access or "food deserts" have made access to healthy foods difficult and costly. Since poverty is part of the USDS definition of food desert (US Department of Agriculture, 2014) increasing access implies increasing affordability as well. Several theories (Guagnano, Stern, & Dietz, 1995; Kirscht, 1974; Zepeda & Deal, 2009) can explain why mobile markets may be effective in facilitating fresh fruit and vegetable consumption. They stress the importance of context, or one's environment, including price, in facilitating behaviors. Kirscht's (1974) Health Belief Model suggests that perceived barriers, linked to sociocultural factors, such as convenience, cost, or lack of knowledge, are powerful constraints that prevent one from adopting a behavior. Lack of access in food deserts presents a constraint to eating healthy foods; mobile markets make healthy foods accessible and therefore should facilitate healthy food choices. Similarly, the Attitude-Behavior-Context (ABC) model (Guagnano et al., 1995) states that one's attitude corresponds to one's behavior when one's environment is supportive of a behavior. ABC theory would predict that food deserts are not supportive to healthy eating behaviors because they make access to healthy foods difficult and that mobile markets can support healthy eating behaviors by improving healthy food access. Zepeda and Deal's (2009) Alphabet Theory is built on the two previous models. They postulate that knowledge, information seeking, and habits also influence attitudes and context, which in turn determine behavior.

We address our research questions using a focus group study. Questions for this study were formulated from the Health Belief Model, ABC theory and Alphabet Theory. The focus group questions elicit knowledge about recommended fresh produce consumption, perceptions of the mobile market, affordability, behavior with respect to purchase of fresh produce at the market or elsewhere, reasons for using or not using the mobile market, and barriers to purchase, storage, and preparation of fresh produce.

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