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## Process Evaluation of a Food Marketing and Environmental Change Intervention in tiendas That Serve Latino Immigrants in North Carolina

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### Abstract

This article describes a comprehensive process evaluation of an efficacious store-based intervention that increased store customers' fruit and vegetable consumption. The process evaluation plan was designed at study inception and implemented at baseline, during the intervention, and at immediate postintervention. Four Latino food stores were randomly assigned either to an intervention or to a control condition. Data were collected from store managers, employees, and 139 Latino customers. Researchers used manager, employee, and customer interviews; weekly observations of the store environment; and implementation logs to assess reach, dose delivered, dose received, and fidelity. Results indicated that it is possible to reach customers in a store-based intervention. Indicators of dose delivered demonstrated that the intervention was implemented as planned, and in the case of employee training, it exceeded the plan. Dose received data indicated that customers moderately engaged with the intervention activities. Together these suggest that the intervention was delivered with good fidelity. Comprehensive process evaluation efforts can facilitate the identification and elimination of barriers to implementation. This approach can serve as a model for future store-based interventions. The study demonstrated that it is feasible to implement Latino food store-based interventions to increase access to and consumption of fruits and vegetables.

### Keywords

behavior change; Latino health; process evaluation; store-based interventions

## INTRODUCTION

Increasing access to fresh fruits and vegetables (FVs) and other healthy foods is considered a viable and promising strategy to improve diet and prevent and control chronic diseases, and consuming more FVs plays an important role in the prevention and control of obesity (Foltz, Harris, & Blanck, 2012). These strategies are particularly important among racial/ethnic groups whose disparities in FV consumption compared to Whites are well documented

(Dubowitz et al., 2007; Dubowitz, Subramanian, Acevedo-Garcia, Osypuk, & Peterson, 2008; Glanz & Yaroch, 2004; Pomerleau, Lock, Knai, & McKee, 2005). Among Latino immigrants, these disparities are associated with cultural processes such as acculturation (Ayala, Baquero, & Klinger, 2008), as well as with social and physical factors in the communities in which they settle (Lara, Gamboa, Kahramanian, Morales, & Hayes Bautista, 2005). Available evidence suggests that poor and primarily minority communities where Latino immigrants settle in have fewer grocery stores and fewer produce markets with fresh FVs compared to high-income and White communities (Dubowitz, Heron, et al., 2008; Moore & Diez Roux, 2006). In addition, lack of access to healthy foods in these neighborhoods is associated with characteristics of the socioeconomic environment, such as wealth of the neighborhood (Reidpath, Burns, Garrard, Mahoney, & Townsend, 2002), ethnic composition (Moore & Diez Roux, 2006), and neighborhood deprivation (Cubbin, Hadden, & Winkleby, 2001).

Food store-based interventions (FSBIs) to promote consumption of FVs and other healthy foods have gained interest in the past decade (Cobb & Solera, 2003; Gittelsohn et al., 2006; Glanz & Yaroch, 2004; Steenhuis, van Assema, Reubsat, & Kok, 2004), though published research findings that describe their feasibility and efficacy are limited (Gittelsohn, Rowan, & Gadhoke, 2012). Even less is known about the feasibility and efficacy of FSBIs for Latinos (Gittelsohn et al., 2012). Because of the innovative nature of these types of interventions, process evaluation efforts can help us understand how to do this well (Steckler & Linnan, 2002). For example, systematically documenting the implementation of an intervention is necessary for identifying potential Type III errors (i.e., assuming intervention participants received 100% of the materials when they did not), improving intervention designs, and disseminating effective interventions (Steckler & Linnan, 2002; Story, Lytle, Birnbaum, & Perry, 2002). Process evaluation findings of previous FSBIs suggest that these interventions are feasible to implement, and customers receive a moderate to high intervention dose (Curran et al., 2005; Gittelsohn et al., 2006; Kristal, Goldenhar, Muldoon, & Morton, 1997; Rodgers et al., 1994); however, there is limited evidence of these types of interventions in small, culturally specific food stores (Gittelsohn et al., 2012; Laska, Borradaile, Tester, Foster, & Gittelsohn, 2010).

As Latinos represent the largest growing U.S. population and share a large disease burden, identifying effective strategies to reach them and promote health is critical. *Tiendas* are culturally specific stores that cater to a Latino population, are located in their neighborhoods, and have the potential to provide access to healthy food options. Documenting the process of successfully implementing these types of interventions can fill this knowledge gap and potentially speed up dissemination of evidence-based interventions.

The present study describes the process evaluation of *Vida Sana Hoy y Mañana* (Healthy Life Today and Tomorrow), an FSBI that was effective at increasing FV intake among Latino immigrants in North Carolina (Ayala, Baquero, Laraia, Ji, & Linnan, 2013).

## METHOD

### Study Design

The present study used a comprehensive process evaluation framework to examine the implementation of an effective FSBI on consumption of FVs among Latino tienda customers in North Carolina. Process evaluation measures consisted of dose delivered, dose received, reach, and fidelity. Data were collected at baseline, during the intervention, and at immediate postintervention from a variety of sources. The principal investigator (PI) of the study is a professor at San Diego State University, thus her institutional review board approved all activities and procedures.

### Setting

Latinos in North Carolina are the second largest racial/ethnic group in the state; they are predominately Spanish speakers with a mean age of 23 years (U.S. Census Bureau, 2009). Within the counties in which this study was implemented, Latinos represent approximately 8% to 14% of the population. Latino county residents are on average 26 years old compared to an average age of 35 years in the general population in these counties, and a greater percentage are living below the poverty line (30%) compared to the general county population (19%). To address their needs, tiendas have opened in their neighborhoods. Tiendas are ethnic food stores that are culturally familiar, have Spanish-speaking employees, and provide foods and other services that may not be available in conventional supermarkets and supercenters (Food Marketing Institute, 2004). Four eligible tiendas were pair-matched based on their number of employees and types of products and services available (e.g., available FVs and butcher section) and then randomized either to an intervention or to a delayed treatment control condition. Tiendas did not significantly differ on any of the key inclusion criteria. We present data from the two tiendas assigned to the intervention, as control tiendas were not engaged in process evaluation measures. Tiendas assigned to the intervention condition had been in operation between 6 and 12 years and had a butcher, a produce section, and prepared foods.

### Vida Sana Hoy y Mañana Intervention

The 16-week intervention was designed to promote FV consumption among tienda customers using social and physical environmental change strategies: manager and employee trainings, in-store structural changes, and a fresh FV marketing campaign. The intervention was informed by two theoretical frameworks: socioecologic framework (McLeroy, Bibeau, Steckler, & Glanz, 1988) and social cognitive theory (McAlister, Perry, & Parcel, 2008). Table 1 describes in detail the content, implementation, and activities of each component. For more information on the main trial, see Ayala et al. (2013).

### Process Evaluation Measures and Instruments

Researchers used manager, employee, and customer interviews; weekly unobtrusive observations of the tienda environment; and implementation logs to assess reach, dose delivered, dose received, and fidelity. Customer measures included interviews with evaluation cohort customers (cohort customers), as well as customers recruited to complete a

onetime intercept interview at immediate postintervention (noncohort customers; Ayala et al., 2013). All interviews were conducted in Spanish. Research staff were trained on evaluation activities, not involved in the intervention, and supervised by the PI (GXA) and the project manager (PM; BB).

**Dose Delivered**—Dose delivered was the amount of each intervention activity implemented in relation to the plan and was measured at the tienda level. Intervention staff kept these records. Training sign-in sheets and intervention implementation logs were used to collect these data. *Training sign-in sheets* were used for each manager or employee training session, and *intervention logs* were used by intervention staff to document the use of the food marketing campaign materials in the tienda before and during the food demonstration, as well as after to determine what was left at the tienda to distribute to customers during the week.

**Dose Received**—Dose received was assessed at both the tienda and individual levels, and defined as the degree to which tienda employees and cohort customers were exposed to and interacted with the intervention. Managers and employees completed surveys at immediate postintervention. Survey questions assessed the impact, satisfaction with, and awareness of the intervention activities in the tienda. In addition, employees completed training evaluations after each session they attended and cohort customers completed an immediate postintervention interview, either face-to-face or by phone. Awareness of, recall of, and satisfaction with the messages and activities were assessed with a 21-item scale that used a range of response options to determine the extent to which the cohort customers received the intervention. To assess their opinion of the tienda, a tienda rating scale developed by the Policy Institute (2007) was used. The seven-item scale assessed the overall quality and freshness of products in the tienda, selection of FVs and meat, the price of food, the quality of customer service, and the overall cleanliness of the tienda. Scores ranged from 1 = *poor* to 3 = *very good*. A mean score was computed across all 7 items, with a higher mean score indicating a more highly rated tienda.

**Reach**—Reach was measured at the individual level. Reach was the level of awareness among noncohort customers at immediate postintervention; it measured the extent to which the intended audience received the intervention. Noncohort customers completed the onetime interview using the same questions asked of cohort customers.

**Fidelity**—Fidelity was defined as the extent to which each of the intervention activities were delivered as intended, including the integrity and quality of the intervention implementation. Fidelity was measured by examining the levels of dose delivered compared to dose received.

### Data Analysis and Statistical Methods

SPSS (Version 18) was used to manage and analyze the quantitative data. Data were reviewed for completeness and normality, and descriptive statistics were conducted. Intervention logs, employee feedback and open-ended questions on customers' immediate

postintervention interviews were reviewed and synthesized to identify key themes to obtain a qualitative assessment of the intervention.

## RESULTS

### Dose Delivered

Table 2 presents the intended dose and dose delivered for each intervention component. Three of the manager trainings were delivered as intended. Training sessions at both tiendas exceeded the total 90 minutes of training time expected, with the Tienda A manager receiving a total of 340 minutes and the Tienda B manager receiving a total 395 minutes of training. However, the intervention staff implemented only two of the three intended employee trainings. The module on becoming an FV specialist was not delivered. Nevertheless, in Tienda A, 5 employees attended the trainings and each received a total of 136 minutes of training. In Tienda B, 12 employees attended the trainings and each received a total of 141 minutes of training.

Regarding dose delivered for structural changes, both tiendas selected buffet bars that met U.S. Food and Drug Administration requirements to display fresh-cut FVs and electric juicers to offer fresh FV juices in the prepared-food section. Tienda B selected a four-food buffet bar that was placed on top of the customer service counter, next to the only cash register in the tienda, and at eye level to an adult customer. In Tienda A, the manager selected a freestanding-display buffet bar and contributed \$500 toward its purchase. However, the buffet bar was not assembled and displayed until 8 weeks into the intervention, and only after the intervention staff helped the tienda staff assemble it. The manager and assistant manager reported not having time or space in the tienda to display the buffet. The buffet bar was eventually placed between the butcher and the main cash register. Once operational, all customers were able to see the new display and purchase ready-to-eat FV packets, prepared by the tienda staff with project staff assistance. In addition, differences in implementation were observed in the presence of pronto (fast) paks, ready-to-eat FV packets with labels containing the study's logo. Tienda A did not produce or sell pronto paks during the food marketing campaign, partially due to the delay in implementing their buffet bar, whereas Tienda B made strong efforts to sell the paks using their new equipment. On average, they prepared and sold 22 pronto paks per week.

Regarding the food marketing campaign, over 75% of the intended dose was delivered for large and small posters. Intervention staff delivered a median of 70 (50–85) promo recipe cards per week in Tienda A and 60 (45–110) in Tienda B. A median range of 60 to 70 promo cards (recipe cards) were delivered per week. One streamer was displayed per week at each intervention tienda as intended. On average, a median of 15 (range: 1–75) price signs were displayed next to FVs in the produce section. All eight demonstrations were implemented as planned. On average, each demonstration lasted 6 hours. For both tiendas, the intervention specialist prepared an average of 90 food samples. Of those, between 88 and 92 food samples were given to customers, indicating the high dose delivered for this component.

## Dose Received

From manager interviews, we learned that during implementation, they tried to provide better customer service and maintain the cleanliness of the tienda. Overall, tienda managers and employees considered the intervention feasible to implement and reported that print materials were easy to read and they trusted the information. Employees reported that learning about customer service helped them to promote the purchase of FVs. They liked the trainings, recipes, and food demonstrations the most.

Table 3 describes the dose received for cohort customers. Cohort customers reported that they observed a median of 16 (0–27) changes in the tienda. These changes included employees providing better and more customer services, the new marketing campaign, structural changes in the tienda, and observing food demonstrations. Customers reported high overall customer satisfaction and store cleanliness, and 47% reported very good-priced produce. This rating is important because price continues to be a barrier to FV purchases. Customers reported taking between one and four pieces of print material from intervention staff during the food demonstrations. However, they reported not receiving any print materials from tienda managers or employees during the weekdays, as was planned. Almost 60% of the customers observed intervention activities. They reported attending a median of two (0–6) food demonstrations, buying the ingredients for the recipes a median of one time (0–3), and considering the recipes somewhat easy to make. Generally, customers reported that the print materials were easy to read (65%), and 73% trusted the information. Almost 70% of customers mentioned that the changes in the tienda and food demonstrations motivated them to change what they purchased from the tienda.

## Reach

A convenience sample of 50 noncohort customers was recruited at immediate postintervention. Fifty-two percent of these customers were female, and most (72%) came to the tienda with others. The majority of the customers were between 18 and 28 years of age (40%). Noncohort customers reported observing a median of 5 changes (0–24) in the tienda during the intervention period. They rated these changes positively ( $9.3 \pm 1.6$  of 10). Fifty-six percent of the customers reported visiting the tienda once a week or more, and 60% reported changing their eating habits in the past 2 months. When asked specifically if they noticed any activity to promote healthy eating, only 29% of customers reported that they did. Of those, the majority trusted the information and reported it was easy to understand.

## Fidelity

In this process evaluation approach, fidelity was assessed as the extent to which the intended intervention was delivered. Feedback from managers and employees indicated that the customer service training was the most helpful, followed by the nutrition information. The majority of employees considered the trainings “very relevant” for their work. Another measure of the fidelity of the trainings was the percentage of time that managers and employees spent in the trainings. Managers spent over 300 minutes and employees over 150 minutes in trainings with project staff. All of this time was paid work time, as approved by the manager. Structural changes were the most challenging part of intervention implementation; however, managers worked with project staff as planned to select the

equipment and implement the changes. All of the funding allocated for these changes was used as intended. The equipment selected was used to display and promote the sale of fresh FVs. In both tiendas, equipment selected was displayed prominently for all customers to see; many reported noticing the changes in the tiendas. The food marketing campaign was implemented as planned. All food demonstrations were implemented as planned and lasted the allotted time on average. Print materials and food samples were distributed during the food demonstrations as intended. Even though intervention staff implemented the food marketing campaigns as planned during the weekend days, employees did not distribute print materials during weekdays as intended.

## DISCUSSION

This article describes the results of a comprehensive process evaluation of an efficacious tienda-based intervention that increased FV intake among tienda customers. Findings from this study indicate that the intervention was implemented as planned and that it was feasible for tiendas, managers, employees, and customers to participate in a research study designed to improve access to and increase consumption of FVs.

We successfully delivered the planned intervention dose. Of the intervention strategies implemented, tienda manager and employee trainings had the highest dose received. Managers and employees actively engaged in the trainings, demonstrated by the number of employees who attended the trainings and the number of minutes spent in training. Employee trainings were one of the most innovative components of the intervention as few previous FBSIs included them as part of their efforts (Escaron, Meinen, Nitzke, & Martinez-Donate, 2013; Gittelsohn et al., 2012). Increasing the capacity of the tienda employees to provide better customer service, learn about nutrition, and promote fresh FVs was a benefit that managers reported from their involvement. Structural changes were more challenging to deliver in the intended time line. Allowing for more time and resources to implement structural changes in the tienda is critical for success. Although the managers saw the benefit of receiving free equipment, their readiness to use this equipment was contingent on the ease of installation and use, having someone to maintain it in the tienda, and the added value to their business. For example, one tienda manager already knew the kind of equipment needed and had a place in the store for it, making the selection and implementation feasible and efficient. However, in the other tienda, the manager was hesitant to make the changes and to invest the employees' time in it, despite the fact that this manager invested an additional \$500 to buy a larger piece of equipment. A longer time line to implement structural changes should be considered, where additional time could be spent identifying different strategies and ways to implement them to promote FVs that better "fit" in the tienda. For example, tienda managers need time to incorporate the preparation of pronto paks into their employees' daily routines, thereby enhancing the potential to adopt and sustain the structural changes. With few exceptions (Dannefer, Williams, Baronberg, & Silver, 2012), the types of structural changes implemented in this intervention have not been widely used in other FBSIs; of the available evidence, labeling and price changes were the most common strategies used in small stores (Escaron et al., 2013; Gittelsohn et al., 2012).



Measures of dose delivered also demonstrated that the intervention staff implemented the food marketing campaign as planned. Food demonstrations on the weekends and new campaign materials in the tienda were feasible. However, engaging tienda employees to deliver print materials to customers during the weekdays was challenging. Future interventions should consider allocating more time for project staff to model the FV promotion behaviors, rewarding employees with an incentive program for distributing the print materials, and/or identifying one or two employees to serve as store champions (Steckler & Linnan, 2002).

From measures of dose received, we learned that it was feasible to conduct a store-based intervention to engage individual customers in the intervention. Customers reported observing positive changes in the tienda and receiving print materials from intervention staff during the weekends, which confirms our dose delivered data. Importantly, customers reported that print materials were easy to read and that they trusted the information. This increases the likelihood that customers will use, reread, and share the materials they received. However, the average number of times that customers attended food demonstrations and bought ingredients of the recipes promoted was lower than expected. In future efforts, a longer period for food demonstrations and additional strategies to link the promoted recipes to their ingredients should be considered.

Our reach data provided evidence that noncohort customers also participated in the intervention activities. This indicator was critical to determine if our tienda-based intervention reached all customers. Noncohort customers also considered the print materials easy to read and trustworthy. Fidelity data indicated that the intervention was implemented as planned. Levels of dose received could have been higher; however, this study was a pilot, and a larger evaluation of this intervention approach is currently being tested with funding from the National Institutes of Health. Longer and more intense interventions could increase the dose received and awareness of the activities occurring in the tiendas. Compared to other similar studies, ours provides supporting evidence that customer intervention effects on diet found in the main trial (Ayala et al., 2013) were due to the implementation, increasing the validity of the main trial results (Escaron et al., 2013; Gittelsohn et al., 2012).

Important lessons were learned from this study. Tiendas are for-profit businesses, and an intervention should consider their bottom line. One way we addressed this was by engaging the tienda managers in intervention implementation and explaining how the intervention would benefit his or her customer base and possibly increase the store's profitability; other studies have used similar strategies to increase the buy-in and participation of store owners (Gittelsohn et al., 2010). The PI and PM spent a considerable amount of time in the tiendas, developing a trusted and cordial relationship with the managers and employees. Employees were more likely to participate and provide feedback when they felt comfortable with project staff. As some employees had multiple roles in these tiendas, the PI and PM worked with the managers and employees to determine the extent to which they could participate in intervention implementation, based on their busy schedules (Israel, Schulz, Parker, & Becker, 1998). Thus, employees were asked to conduct activities that integrated with their daily tasks, such as handing out print materials; however, additional training may be warranted to ensure employees feel confident about carrying out these activities.

This study has several limitations. First, most results are based on self-report, potentially introducing recall or social desirability biases. In addition, some measures were collected in a small sample of individuals, limiting generalizability. These results may not be applicable to other types of food stores (e.g., corner stores) or to different racial/ethnic group (e.g., Asians). Despite these limitations, the data were collected from different sources (e.g., tienda employees, customers), using multiple methods (e.g., self-report, observation) and could be linked to all intervention components. In addition, Latino participants in the study were similar in demographics to the population of Latinos of the county, increasing the generalizability of the findings.

FSBI to increase access to fresh FVs have emerged in the past several years as a feasible and effective health promotion strategy. This study demonstrates the feasibility of working with tiendas, managers, employees, and customers, as well as the ability to implement a process evaluation plan. This approach should be considered in the context of other structural and system change interventions to reduce disparities in access to FVs. We believe that reporting key process evaluation results helps clarify which aspects of the intervention were delivered and received as intended, as well as explaining intervention challenges. We consider this information critical for two reasons: to propose a process evaluation model applicable to FSBI and to demonstrate the feasibility and fidelity of intervention implementation. Future FSBI can benefit from a more informed understanding of implementation strengths and challenges.

## References

- Ayala GX, Baquero B, Klinger S. A systematic review of the relationship between acculturation and diet among Latinos in the United States: implications for future research. *Journal of the American Dietetic Association*. 2008; 108:1330–1344. [PubMed: 18656573]
- Ayala GX, Baquero B, Laraia BA, Ji M, Linnan LA. Efficacy of a store-based environmental change intervention compared with a delayed treatment control condition on store customers' intake of fruits and vegetables. *Public Health Nutrition*. 2013; 16:1953–1960. [PubMed: 23561842]
- Cobb KF, Solera MK. 5-A-Day: A strategy for environmental change: Topics in clinical nutrition. *Topics in Clinical Nutrition*. 2003; 18:245–253.
- Cubbin C, Hadden WC, Winkleby MA. Neighborhood context and cardiovascular disease risk factors: The contribution of material deprivation. *Ethnicity & Disease*. 2001; 11:687–700. [PubMed: 11763293]
- Curran S, Gittelsohn J, Anliker J, Ethelbah B, Blake K, Sharma S, Caballero B. Process evaluation of a store-based environmental obesity intervention on two American Indian Reservations. *Health Education Research*. 2005; 20:719–729. DOI: 10.1093/her/cyh032 [PubMed: 15872001]
- Dannefer R, Williams DA, Baronberg S, Silver L. Healthy bodegas: Increasing and promoting healthy foods at corner stores in New York City. *American Journal of Public Health*. 2012; 102:e27–e31. DOI: 10.2105/AJPH.2011.300615
- Dubowitz T, Acevedo-Garcia D, Salkeld J, Lindsay AC, Subramanian SV, Peterson KE. Lifecourse, immigrant status and acculturation in food purchasing and preparation among low-income mothers. *Public Health Nutrition*. 2007; 10:396–404. DOI: 10.1017/S1368980007334058 [PubMed: 17362536]
- Dubowitz T, Heron M, Bird CE, Lurie N, Finch BK, Basurto-Davila R, ... Escarce JJ, ... Escarce JJ. Neighborhood socioeconomic status and fruit and vegetable intake among whites, blacks, and Mexican Americans in the United States. *American Journal of Clinical Nutrition*. 2008; 87:1883–1891.

- Dubowitz T, Subramanian S, Acevedo-Garcia D, Osypuk TL, Peterson KE. Individual and neighborhood differences in diet among low-income foreign and U.S.-born women. *Women's Health Issues*. 2008; 18:181–190. DOI: 10.1016/j.whi.2007.11.001 [PubMed: 18222706]
- Escaron AL, Meinen AM, Nitzke SA, Martinez-Donate AP. Supermarket and grocery store-based interventions to promote healthful food choices and eating practices: A systematic review. *Preventing Chronic Disease*. 2013; 10:E50.doi: 10.5888/pcd10.120156 [PubMed: 23578398]
- Foltz JL, Harris DM, Blanck HM. Support among U.S. adults for local and state policies to increase fruit and vegetable access. *American Journal of Preventive Medicine*. 2012; 43(3 Suppl 2):S102–S108. DOI: 10.1016/j.amepre.2012.05.017 [PubMed: 22898158]
- Food Marketing Institute. *El Mercado 2004: A perspective on US Hispanic shopping behavior*. Arlington, VA: Author; 2004.
- Gittelsohn J, Dyckman W, Tan ML, Boggs MK, Frick KD, Alfred J, ... Palafox NA. Development and implementation of a food store-based intervention to improve diet in the Republic of the Marshall Islands. *Health Promotion Practice*. 2006; 7:396–405. DOI: 10.1177/1524839905278620 [PubMed: 16885512]
- Gittelsohn J, Rowan M, Gadhoke P. Interventions in small food stores to change the food environment, improve diet, and reduce risk of chronic disease. *Preventing Chronic Disease*. 2012; 9doi: 10.5888/pcd9.110015
- Gittelsohn J, Suratkar S, Song HJ, Sacher S, Rajan R, Rasooly IR, ... Anliker JA. Process evaluation of Baltimore healthy stores: A pilot health intervention program with supermarkets and corner stores in Baltimore City. *Health Promotion Practice*. 2010; 11:723–732. DOI: 10.1177/1524839908329118 [PubMed: 19144859]
- Glanz K, Yaroch AL. Strategies for increasing fruit and vegetable intake in grocery stores and communities: Policy, pricing, and environmental change. *Preventive Medicine*. 2004; 39(Suppl 2): 75–80. DOI: 10.1016/j.ypmed.2004.01.004
- Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: Assessing partnership approaches to improve public health. *Annual Review of Public Health*. 1998; 19:173–202. DOI: 10.1146/annurev.publhealth.19.1.173
- Kristal AR, Goldenhar L, Muldoon J, Morton RF. Evaluation of a supermarket intervention to increase consumption of fruits and vegetables. *American Journal of Health Promotion*. 1997; 11:422–425. [PubMed: 10168262]
- Lara M, Gamboa C, Kahramanian MI, Morales LS, Hayes Bautista DE. Acculturation and Latino health in the United States: A review of the literature and its sociopolitical context. *Annual Review of Public Health*. 2005; 26:367–397.
- Laska MN, Borradaile KE, Tester J, Foster GD, Gittelsohn J. Healthy food availability in small urban food stores: A comparison of four US cities. *Public Health Nutrition*. 2010; 13:1031–1035. DOI: 10.1017/S1368980009992771 [PubMed: 19968901]
- McAlister, AL., Perry, CL., Parcel, GS. How individuals, environments, and health behaviors interact: Social cognitive theory. In: Glanz, K.Rimer, BK., Viswanath, K., editors. *Health behavior and health education: Theory, research and practice*. San Francisco, CA: Jossey-Bass; 2008. p. 169-188.
- McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Education Quarterly*. 1988; 15:351–377. [PubMed: 3068205]
- Moore LV, Diez Roux AV. Associations of neighborhood characteristics with the location and type of food stores. *American Journal Public Health*. 2006; 96:325–331.
- Policy Link. Healthy food, healthy communities. n.d. Retrieved from <http://www.policylink.org/Research/HealthyFood/CFA.html>
- Pomerleau J, Lock K, Knai C, McKee M. Interventions designed to increase adult fruit and vegetable intake can be effective: A systematic review of the literature. *Journal of Nutrition*. 2005; 135:2486–2495. [PubMed: 16177217]
- Reidpath DD, Burns C, Garrard J, Mahoney M, Townsend M. An ecological study of the relationship between social and environmental determinants of obesity. *Health Place*. 2002; 8:141–145. [PubMed: 11943585]

- Rodgers AB, Kessler LG, Portnoy B, Potosky AL, Patterson B, Tenney J, ... Mathews O. "Eat for Health": A supermarket intervention for nutrition and cancer risk reduction. *American Journal of Public Health*. 1994; 84:72–76. [PubMed: 8279615]
- Steckler, A., Linnan, L. *Process evaluation for public health interventions and research*. San Francisco, CA: Jossey-Bass; 2002.
- Steenhuis I, van Assema P, Reubsæet A, Kok G. Process evaluation of two environmental nutrition programmes and an educational nutrition programme conducted at supermarkets and worksite cafeterias in the Netherlands. *Journal of Human Nutrition and Dietetics*. 2004; 17:107–115. DOI: 10.1111/j.1365-277X.2004.00507.x [PubMed: 15023190]
- Story M, Lytle LA, Birnbaum AS, Perry CL. Peer-led, school-based nutrition education for young adolescents: Feasibility and process evaluation of the TEENS study. *Journal of School Health*. 2002; 72:121–127. DOI: 10.1111/j.1746-1561.2002.tb06529.x [PubMed: 11962228]
- U.S. Census Bureau. American community survey. 2009. Retrieved from <http://www.census.gov/acs/www/>

TABLE 1

## Intervention overview and Implementation

<i>Intervention Component</i>	<i>Overview</i>	<i>Implementation/Activity</i>
Tienda manager and employee trainings	<ul style="list-style-type: none"> <li>The objective was to sharpen managers' and employees' business skills to promote the sale of fruits and vegetables (FVs).</li> <li>Three separate 30-minute group training sessions were designed for managers and employees.</li> <li>Total planned training time was 90 minutes per group session.</li> <li>All managers and at least two employees identified by the managers were invited to attend the trainings.</li> </ul>	<ul style="list-style-type: none"> <li>Manager trainings consisted of three modules:           <ul style="list-style-type: none"> <li>Introduction to the program</li> <li>Marketing strategies for FVs</li> <li>Becoming an FV specialist</li> </ul> </li> <li>Managers were trained individually.</li> <li>Employees' trainings consisted of three modules: Introduction to the program, Customer service and suggestive selling, Becoming an FV specialist</li> <li>All employees were invited to attend the trainings.</li> <li>Employee trainings were conducted in groups.</li> <li>The principal investigator and project manager conducted the trainings.</li> <li>All trainings were conducted in Spanish.</li> </ul>
Structural changes	<ul style="list-style-type: none"> <li>One thousand dollars was allocated to each intervention tienda to implement structural changes to promote the sale of fresh produce.</li> </ul>	<ul style="list-style-type: none"> <li>Project staff worked with managers to identify and install equipment and/or use other materials.</li> <li>Project staff encouraged tienda employees to prepare and sell pronto (fast) paks, ready-to-eat fresh FVs packaged in clam shells or baggies, both approved by the U.S. Food and Drug Administration.</li> </ul>
Food marketing campaign	<ul style="list-style-type: none"> <li>Food marketing campaign was designed for 8 weeks of implementation.</li> <li>The food marketing campaign consisted of           <ul style="list-style-type: none"> <li>POP materials:</li> <li>Posters were used to prompt purchasing of FVs.</li> <li>Recipe cards were used to promote a healthy Latino dish.</li> <li>Promotional business cards provided simple tips for healthy eating intended for male customers.</li> <li>Price signs were used for writing in the price of the product.</li> <li>Streamers were used to promote the produce of the week.</li> <li>FDs were conducted weekly during the busiest weekend day.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Each week a new series of point-of-purchase (POP) materials were unveiled and distributed to tienda staff and customers.</li> <li>POP materials were centered on a recipe that highlighted a traditional Latino dish.           <ul style="list-style-type: none"> <li>Recipes and promotional business cards were handed out during the weekend food demonstration (FD) days by project staff and by tienda staff during the weekdays</li> <li>Shelf tags were affixed to the shelves where canned and frozen FVs were placed.</li> <li>Suggestive selling tips were given to the butcher, prepared-food staff, and cashier to reinforce the messages on the print materials as they interacted with customers.</li> </ul> </li> <li>FDs showed customers how to make the recipe of the week.</li> <li>Samples of the recipe were distributed. Shelf tags were used to promote the purchase of other FVs.</li> </ul>

TABLE 2

*Tienda* dose Intended and dose delivered by Intervention

<i>Intervention Components</i>	<i>Total Dose Intended</i>	<i>Dose Delivered</i>	
		<i>Tienda A</i>	<i>Tienda B</i>
Trainings			
Employee			
Number of employee trainings	3	2	2
Total minutes of employee trainings <sup>a</sup>	90	136	141
Number of employees trained in group	3	5	12
Manager			
Number of manager trainings	3	3	4
Total minutes of manager trainings <sup>a</sup>	90	340	395
Number of managers trained	1–2	1	2
Structural changes			
Equipment	\$1,000	6-Food buffet bar (+\$500)	4-Food buffet bar
Electric juicer		Yes	Yes
<i>Median (Range)</i>			
Food marketing			
Weekly display			
Posters			
Large posters	1 (1–16)	6 (2–16)	11 (2–14)
Small posters	4 (1–32)	19 (4–32)	22 (4–28)
Streamers	1 (1–8)	1(1–3)	1(1–3)
Weekly materials given			
Price signs	Variable	15 (12–46)	17 (1–75)
Suggestive selling prompts	4	6 (1–23)	6 (1–6)
Promo recipe cards given <sup>b</sup>	200	70 (50–85)	60 (45–110)
Business cards <sup>b</sup>	50	69 (1–88)	68 (1–110)
Total pronto (fast) paks made/sold <sup>c</sup>	—	0	22 (15–28)
Times restaurant prepared recipes	—	0	0
Food demonstrations			
Number of food demonstrations held	8	8	8
Hours of each food demonstration	6	6 (5.5–6.5)	6.26 (6–8)
Servings prepared at each demonstration	100	92 (50–160)	88 (35–120)
Food samples given at each demonstration	100	92 (1–160)	88 (15–119)

<sup>a</sup>Total training sessions time exceed the intended 90 minutes of total time.

<sup>b</sup>Given during food demonstrations.

<sup>c</sup>Ready-to-eat fresh fruits and vegetables packaged in clam shells or baggies.

TABLE 3

cohort customers'<sup>a</sup> *Tienda* rating and dose received at Immediate Postintervention

	% (n)	
	Baseline	Immediate Postintervention
Ratings of very good on key dimensions of the tienda		
Customer service	84.5 (71)	89.5 (51)
Overall cleanliness	73.8 (62)	86.0 (49)
Selection of meats	79.0 (64)	83.9 (47)
Selection of fruits and vegetables	41.7 (84)	75.4 (43)
Quality and freshness of food products	39.8 (83)	71.9 (41)
Price of food products	19.0 (16)	28.1 (16)
Overall tienda quality <sup>b</sup> , <i>M</i> ( <i>SD</i> )	2.5 (.28)	2.7 (0.24)
<i>Mdn</i> ( <i>Range</i> ) or <i>M</i> ( <i>SD</i> ) or % ( <i>n</i> )		
Dose received		
Number of changes observed in the tienda <sup>c</sup>		16 (0–27)
How much did you like the changes made in the tienda? <sup>d</sup>		9 (5–11)
Times received healthy eating information while shopping at the tienda <sup>e</sup>		
From print materials		44.4% (12)
From tiendas/program staff		0% (0)
Noticed any activity in the tienda that promoted health?		57.4% (31)
Attended a food demonstration at the tienda		27.8% (15)
If yes, how many did you try?		2 (0–6)
If yes, how frequently you bought the ingredients of the recipes?		1 (0–3)
Impression of the print materials		
Materials were easy to read		65.4% (17)
Motivated customers to change what they bought in the tienda		61.5% (26)
Trusted the information in the materials		73.1% (26)
At home, which recipes demonstrated at the tienda did you try?		
Fajita		27.8% (5)
Fruit platter		38.9% (7)
Very easy to prepare the recipe		53.8% (7)
Motivated a lot to change what you buy in the tienda after food demonstration		38.5% (5)

<sup>a</sup>Customers who participated in the cohort evaluation.<sup>b</sup>Tienda rating range: 1 = *low* to 3 = *high*; sum score of 7 items.<sup>c</sup>Sum score of 32 items.<sup>d</sup>Rating scale 1 to 10, where 1 = *did not like at all the change* to 10 = *liked the change a lot*.<sup>e</sup>Period of time: in the past 2 months.