

Strategies for increasing fruit and vegetable intake in grocery stores and communities: policy, pricing, and environmental change

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Abstract

Background. Grocery stores and community settings are important and promising venues for environmental, policy, and pricing initiatives to increase fruit and vegetable intake. This article examines supermarket-based and community environmental, policy, and pricing strategies for increasing intake of fruits and vegetables and identifies promising strategies, research needs, and innovative opportunities for the future.

Methods. The strategies, examples, and research reported here were identified through an extensive search of published journal articles, reports, and inquiries to leaders in the field. Recommendations were expanded with input from participants in the CDC/ACS-sponsored Fruit and Vegetable, Environment Policy and Pricing Workshop held in September of 2002.

Results. Four key types of grocery-store-based interventions include point-of-purchase (POP) information; reduced prices and coupons; increased availability, variety, and convenience; and promotion and advertising. There is strong support for the feasibility of these approaches and modest evidence of their efficacy in influencing eating behavior. Church-based programs, child care center policies, and multisectoral community approaches show promise.

Conclusions. Both descriptive and intervention research are needed to develop and evaluate more effective environmental strategies to increase F&V intake in grocery stores and communities. Innovative strategies, partnerships, grass roots action involving economic development for low-income communities, and sustainability are important considerations.

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Introduction

Consumption of fruits and vegetables is essential to healthy nutrition, chronic disease prevention, and weight control [1]. Eating more fruits and vegetables can help control weight and may also lead to eating fewer high-fat foods [2], although most Americans are still not meeting the goal of consuming five or more servings per day [3].

Because of the importance of healthful nutrition to large populations, population-based interventions are necessary. Ecological approaches offer promising strategies for health behavior change. Ecological approaches to behavior change posit that personal, social, and environmental factors are all influential [4,5]. Therefore, grocery stores and community

settings where groups of people interact offer important potential for improving eating patterns.

The Centers for Disease Control and Prevention and the American Cancer Society sponsored the Fruit and Vegetable Environment, Policy, and Pricing Workshop, held in Atlanta on September 26–27, 2002. Workshop goals included identifying types of interventions, specific programs that may be ready for national dissemination, and research needs related to environmental, policy, and pricing strategies to promote greater consumption of fruits and vegetables. The approximately 50 participants at the Workshop included representatives of relevant federal and state agencies, national nongovernmental organizations, and the produce and food service industries; university-based researchers; and school- and community-based nutrition program managers.

This article, one in a series commissioned as part of the Workshop proceedings, is not intended as a formal review but rather provides an overview of environmental, policy, and pricing strategies for increasing consumption of fruits

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and vegetables that are based in grocery stores and other community locations such as neighborhoods, child care centers, and churches. Another article in this special issue contains a full review of nutrition environmental interventions in adult populations conducted in worksites, universities, grocery stores, and restaurants [6]. The first part of the current paper examines grocery store strategies, followed by interventions in other community settings. The strategies, examples, and research discussed here were identified through an extensive search of published journal articles, reports, and inquiries to leaders in the field. This overview provides summaries of research findings and literature reviews, illustrative examples, and bibliographic sources. The second part of this paper contains recommendations for action based on input from participants in the Fruit and Vegetable Environment, Policy, and Pricing Workshop.

Grocery stores as settings for interventions

New research is beginning to provide support for the role of grocery stores, or supermarkets, as important contributors to nutrition among residents of neighborhoods. A recent study found that adult individuals' fruit and vegetable intake increased with each additional supermarket in a census tract [7]. The availability of healthful products in stores has been found to be associated with reported healthfulness of the diets of residents in nearby neighborhoods [8]. In addition, supermarkets are less prevalent in minority communities [7], which may account for some nutrition-related health disparities among minorities.

Grocery stores play a major role in food purchasing, with average per-person weekly grocery expenses of \$38 [9]. Further, grocery stores are expanding their offerings in categories known as "meal solutions," which includes deli and prepared foods; ready-to-eat and -heat foods, and labor-saving and step-saving ingredients (such as precut and cleaned vegetables) [9]. Supermarkets now account for nearly one-fifth of all take-out foods [9]. Therefore, grocery stores are an important and promising venue for environmental, policy, and pricing initiatives to increase fruit and vegetable intake.

The "grocery store" category, as referred to here, embraces both large and small locations where consumers can purchase food products in all forms—fresh, packaged, and prepared. Thus, the category includes supermarkets, convenience stores, farmer's markets, snack shops, and a recent "virtual grocery" innovation, Internet groceries.

Definitions and types of grocery store-based environmental, policy, and pricing interventions

Environmental, policy, and pricing interventions for fruits and vegetables (F&V) are those efforts that aim to improve the health of all people through better nutrition, not

just small groups of motivated or high-risk individuals [10,11]. They reach populations by influencing availability, access, pricing, promotion, and information about F&V. Policy and environmental approaches may have greater impact because they influence the overall environment, reach many people, and are less costly and more enduring than clinical, individually oriented, or small group educational interventions [10].

Four types of grocery store-based environmental, policy, and pricing interventions can be identified: (1) Point-of-Purchase (POP) information; (2) reduced prices and coupons; (3) increased availability, variety, and convenience; and (4) promotion and advertising. Here, each type of intervention is defined and examples of published and/or evaluated interventions are summarized for each type of intervention.

Point-of-purchase (POP) information

A general definition of POP information in grocery stores is the use of shelf labels and/or signage that specifies healthy food choices, based on established criteria. The information may or may not list specific nutritional values, and is sometimes brand-specific. It is often combined with posters, brochures, and/or fliers. A fruit and vegetable-specific definition involves menu and/or signage specifying that food items are good sources of F&V choices, often along with recipes and/or food demonstrations.

There have been numerous studies of POP information interventions in grocery stores from 1982 to the present [11–13]. These strategies have often used posters, brochures, and shelf labels, sometimes within multicomponent programs. Most have focused on decreasing high-fat food choices. POP information programs in grocery stores have been moderately well implemented, and found feasible in low-income communities [14–16]. They have also been found to enhance the image of participating stores [17]. An important aspect of widely implemented programs, such as the "Pick the Tick" food information program in New Zealand, is that they can influence formulation of processed foods in a more healthful direction [18].

Many of the evaluation studies did not include control stores, and the outcomes reported have mainly involved awareness and self-reported use of POP information [12–14]. Some favorable effects were found when brand-specific items were targeted for POP information [19]. In several of the most rigorously designed studies, however, there were effects on knowledge [20] but few or limited effects of the interventions on food purchasing behavior [20–24]. The limitations of using supermarket sales data have been noted in several reports [20,25]. A recent intervention study compared shelf labeling with education only, in a randomized pre–post test experiment in 13 Dutch supermarkets [26]. Although the results showed a trend toward healthier (lower fat) eating in the labeling stores, there was no overall significant impact of the labeling or in-store education [25].

Reduced prices and coupons

General nutrition promotion programs with pricing interventions offer reduced prices or provide discount coupons for healthy choices, and F&V-specific programs adapt these offers for fruits and vegetables, most often at grocery stores or farmers' markets. Two reports of programs in Farmers' Markets show both strong potential and the limitations of our knowledge about the effects of these types of interventions. Balsam and others implemented the Massachusetts Farmers Market Coupon Program for Low-Income Elders across 5 years [27]. The coupons achieved high levels of usage, and attracted new shoppers to the farmers' markets. Across 5 years, they reached more than 20,000 people per year. However, the evaluation involved only people who used the coupons so it cannot be determined if there were changes in consumers' fruit and vegetable purchase or consumption due to the program [27].

Another evaluation involved the Connecticut Farmers Market Coupon Program for WIC participants, which was evaluated in a treatment-control group design. Results showed that those who received coupons were more likely to use the farmers' markets, but that there was no overall impact on their fruit and vegetable consumption [28]. Taken together, these two evaluations suggest that reduced prices and coupons have good potential, but that these strategies may assist those who would have bought F&V even without the interventions.

Increased availability, variety, and convenience

General nutrition programs to increase availability, variety, and convenience are those that provide more healthy food choices, more or less of certain foods and nutrients in prepared foods, and more variety of healthful foods more often. When applied to fruits and vegetables (F&V), this might mean providing more easy-to-use or -eat F&Vs, and/or making F&V easier to locate in stores. Some intriguing experimental evidence suggests that increasing availability and convenience of food items may be effective strategies. Curhan's [29] study of providing "bonus space" for products in stores increased sales, and that improving the quality of the foods' locations, significantly increased sales of hard fruit and cooking vegetables. These marketing strategies are sometimes used to promote brands of nonfood items (such as tobacco). Although the study was conducted three decades ago, similar efforts might prove effective today.

Promotion and advertising

The use of advertising, posters, games, and targeted or multimedia sources to announce and encourage purchases of F&Vs and F&V-rich items can be either a stand-alone strategy or an essential ingredient of other grocery store efforts [20,24,30,31]. Supermarket tours emphasizing healthy shopping involve promotion and can be widely

disseminated, as shown in a nationwide evaluation in the Netherlands [32]. Evaluation of stand-alone promotion and advertising efforts is not available.

Environmental, policy, and pricing interventions to promote fruits and vegetables in communities

Environmental, policy, and pricing interventions for F&V promotion have been implemented in community settings outside schools, worksites, and restaurants. Programs in churches, child care centers, neighborhoods, and multisectoral community programs are briefly summarized here to complement the review of grocery and other commonly used organizational food environments.

Multicomponent heart health programs

Several multisectoral community heart health programs in the 1980s pioneered environmental and policy interventions in supermarkets and other community settings [11,33–36]. These efforts were important because such short-term targeted interventions within the larger studies demonstrated feasibility and showed indications of effectiveness [37], although the improvements in population-wide risk factor reduction achieved by the community heart health programs were modest and/or inconsistent, due in part to strong positive secular trends.

Churches

Two large studies were conducted in Black churches, in North Carolina [38–40] and Georgia [41–43]. The Black Churches United for Better Health study in North Carolina was a multicomponent, multilevel culturally sensitive intervention lasting 20 months. It included both individually oriented and environmental strategies, with the latter including serving more F&V at church functions and partnerships with community grocers [38,39]. A group randomized trial revealed a significant increase of 0.85 servings F&V per day [38]; and interestingly, the program activity with the highest perceived impact was for serving more F&V at church functions [39]. The Eat for Life Trial was a three-arm trial among 14 churches in Georgia, with study conditions including a control condition; self-help education program with a cue phone call; and education plus the cue call and motivational interviewing [42]. Strategies used for the second and third arms that could be considered environmental included recipe books and taste testing. The results showed an increase of 1.3 servings of F&V in the motivational interviewing group over the control group [41]. However, the design made it difficult to discern the impact of environmental intervention components on the overall results. Nevertheless, taken together, the Black Churches United for Better Health and Eat for Life trials clearly illustrate the promise of church environments for promoting

fruit and vegetable consumption. Key elements of these interventions have been merged and packaged as Body and Soul, which is a diffusion program that is currently being evaluated and is a collaborative effort of Emory University, the University of North Carolina, the American Cancer Society, and the National Cancer Institute. Replication in other ethnic groups and religious denominations will be important to establishing the potential of faith-based nutrition improvement efforts that include environmental change strategies.

Child care centers

Programs to implement food and nutrition policies in child care centers in Australia are modeled after restaurant-based “award schemes” [44] that provide incentives for improving food service offerings to include more healthy choices. The “Start Right–Eat Right” Award Scheme includes audit systems to assess menu quality, and was evaluated by assessing the proportion of centers registered in the state of Western Australia. The evaluation showed that there were more healthy choices available in the “registered” centers [45]. However, no data on food intake or aggregate amount of fruit and vegetables served was available.

Research needs and promising strategies

There is a need for both basic “determinants” research—to increase our understanding of shopping behaviors and purchasing behaviors—and applied intervention research. There has been limited, although promising, research on the association between grocery store environments and individual dietary practices [8]. Information about the relationship between purchasing patterns and food intake is needed for both planning and interpreting the findings from evaluations of interventions; this could be done by obtaining data from “loyalty cards” and comparing them to dietary intake assessments. Additional important descriptive research should investigate the extent of specific influences on food purchasing, such as peer influence, word of mouth, coupons, and novelty of food items. There is a need to further develop valid and reliable measures of supermarket environments beyond the excellent but limited work of the early 1990s [46–48]. This work should address how best to assess the fruit/vegetable promotion environment (the earlier work focused on a few high/low fat foods), emphasize developing practical measurement protocols with high inter-rater reliability, and include measures that are adaptable to both large supermarkets and smaller stores such as ethnic food shops.

Also, in view of the economic data suggesting that reduced prices may not increase F&V consumption (see Ballenger, McLaughlin papers), it is important to study price elasticity in different socioeconomic subgroups. Finally, it is

essential to study each step in the hypothesized causal chain, in which environmental changes lead to aggregate changes in food sales, and in turn to individual change in fruit and vegetable intake. Research synthesis should identify the most promising findings and those that advance the state-of-the-science, to help advocate for additional research funding.

Further evaluation of grocery promotions of fruits and vegetables are needed to supplement the research reports on low-fat promotions. Different psychological and social processes may be involved in reducing fat consumption, which involves “less of” or “taking something away”, compared to increasing fruit and vegetable intake, which represents adding more healthy choices. Another consideration is that there is a strong component of increasing awareness and providing information about the fat in foods, while it is considered relatively easy for people to recognize fruits and vegetables without additional nutrient information.

Some potential avenues for research on grocery promotions of fruits and vegetables might include assessment of “cross-promotion,” for example, cereal sold with bananas; use of prepackaged foods with high F&V content; and point-of-purchase information. Nutrition labels that list the proportion of F&V in a food by weight, or number of servings of fruits and vegetables among their ingredients—not just the nutrient content—are worth implementing and evaluating. Grocery stores are also a good venue for evaluating targeted promotion of frozen and canned fruits and vegetables, which have received little attention in past public health initiatives. Other promising ideas worth testing include establishing farm stands at large sports events, increasing the F&V in convenience foods sold as ready-to-eat or ready-to-heat, home delivery of F&V, and using online grocers to increase access to fresh produce.

Additional activities in faith-based organizations might include produce cooperatives at churches, and including healthier foods in church fundraisers. For other community settings, farmers’ markets could be near day care centers and in parking lots to be convenient for people heading home from their workplaces.

There are numerous federally sponsored programs under way that include fruit and vegetable environment, policy, and pricing-related activities that may yield important data in grocery and community environments [49]. They include farmer’s market programs for seniors and in Women, Infants and Children’s (WIC) programs; food stamp nutrition education; and food programs in child and adult day care settings [49]. Future innovations could include incentives for purchasing F&V using food stamps and updating the WIC package to add F&V.

Partnerships and grass roots action

The most important partnerships for advancing grocery store initiatives are likely to be those between supermar-

kets and public health professionals. Retailers, grocery store chains, and professional collaborators such as the Produce for Better Health (PBH) organization can be important partners in health promotion endeavors. They can support innovative programs, make existing data available, and facilitate evaluations of new strategies. Wholesale produce markets, such as “terminal markets” and farm cooperatives, can also play important roles in bringing fruits and vegetables to areas that are currently underserved by supermarkets.

In 1991, as part of the 5 A Day partnership, the PBH Foundation started creating signs, point of sale cards, and brochures for retailers to provide 5 A Day point of purchase information to consumers via grocery store retailers. One effort, in particular, included an evaluation. In the 5 A Day Destination Stop, 24 stores used 5 a day materials and activities and eight stores served as controls. Produce sales during a 12-week test period were compared with sales from 8 weeks of baseline, and then compared with control stores. The 5 A Day Destination Stop stores had an 8.8% increase in sales over the control stores produce departments for the entire period [50].

Community partnerships beyond grocery stores include the agricultural sector and a variety of grass roots efforts [43,51]. These should include working with church groups to bring produce to inner cities and rural areas; incentives for grocery retailers to locate in underserved areas; work with empowerment zones and community economic developers; and linking community health centers to innovative cross-promotions (such as selling fresh fruit with newspapers). In addition, community supported agriculture (CSA), which originated in the United States approximately 20 years ago, connects local farmers and consumers where consumers purchase shares of a season’s harvest to cover operating costs of the farm and the farm in return provides fresh produce to the consumer [52]. Overall, issues to consider when implementing these grass roots efforts include geographic variation and opportunities; seasonality of fresh fruits and vegetables; outreach to lower income and minority audiences; and using appropriate community participation strategies.

Sustainability

In grocery stores and other community settings, sustainability should be considered when planning intervention strategies, research projects, and special community activities [26]. It is important to recognize that large multicomponent interventions within research programs cannot be easily sustained, so advance planning to maintain a contribution to participating communities is essential. Likewise, dissemination of well-researched strategies requires continuing evaluation and surveillance to assure that health and health behavior goals can be achieved outside a controlled research context.

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