

Strategies to Prevent Obesity and Other Chronic Diseases

The CDC Guide to Strategies to Increase the Consumption of Fruits and Vegetables



National Center for Chronic Disease Prevention and Health Promotion
Division of Nutrition, Physical Activity, and Obesity



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Strategies to Prevent Obesity and Other Chronic Diseases

The CDC Guide to Strategies to Increase the Consumption of Fruits and Vegetables

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL CENTER FOR CHRONIC DISEASE PREVENTION AND HEALTH PROMOTION
DIVISION OF NUTRITION, PHYSICAL ACTIVITY, AND OBESITY**



Contents

Using This Guide	1
Introduction to Fruits and Vegetables	3
Strategy 1. Promote food policy councils as a way to improve the food environment at state and local levels	5
Strategy 2. Improve access to retail stores that sell high-quality fruits and vegetables or increase the availability of high-quality fruits and vegetables at retail stores in underserved communities	9
Strategy 3. Start or expand farm-to-institution programs in schools, hospitals, workplaces, and other institutions.....	15
Strategy 4. Start or expand farmers' markets in all settings	21
Strategy 5. Start or expand community supported agriculture programs in all settings.....	27
Strategy 6. Ensure access to fruits and vegetables in workplace cafeterias and other food service venues	31
Strategy 7. Ensure access to fruits and vegetables at workplace meetings and events.....	35
Strategy 8. Support and promote community and home gardens.....	39
Strategy 9. Establish policies to incorporate fruit and vegetable activities into schools as a way to increase consumption.....	43
Strategy 10. Include fruits and vegetables in emergency food programs	49
References	53





Using This Guide

This document provides guidance for program managers, policy makers, and others on how to select strategies to increase the consumption of fruits and vegetables. It offers the most relevant information on each type of strategy. The discussion of each strategy follows the outline defined here.

Strategy

Describes an environmental change or policy-related activity intended to prevent disease or promote health in a group of people, also referred to in the literature as an *approach*. Criteria for inclusion of a strategy in this document are a rationale supporting the strategy and examples of implemented programs.

Definition

Briefly describes the strategy.

Rationale

Explains why the particular strategy is important to efforts to increase the consumption of fruits and vegetables.

Evidence of Effectiveness

Draws on peer-reviewed literature and current practice to summarize the evidence of the strategy's effectiveness.

Key Considerations

Includes information that may be important to keep in mind during the planning, implementation, or evaluation phases of a strategy.

Action Steps

Identifies specific activities for each strategy that public health professionals can take to implement strategies in specific settings, including communities, schools, child care facilities, work sites, and medical care facilities.

Program Examples

Includes examples of programs that use the strategy as a way to increase the consumption of fruits and vegetables. Program examples were selected from interventions described in other publications, such as peer-reviewed journals or program reports, or identified by key informants and through Internet searches.

Resources

Guides the reader to further materials and information that might be useful in planning, implementing, or evaluating the strategy.



Introduction to Fruits and Vegetables

Eating a diet high in fruits and vegetables is associated with a decreased risk of many chronic diseases, including heart disease,¹ stroke,² high blood pressure,³ diabetes,⁴ and some cancers.⁵ Research also has found that replacing foods of high energy density (high calories per weight of food) with foods of lower energy density, such as fruits and vegetables, can be an important part of a weight-management strategy.^{6,7}

In addition, fruits and vegetables are good sources of many important nutrients, including potassium, vitamin C, folate, fiber, and numerous phytochemicals. The importance of fruits and vegetables as part of healthy diets is illustrated by the *Dietary Guidelines for Americans 2010*, in which two of the four recommended food groups are fruits and vegetables.⁸

The U.S. Department of Agriculture's (USDA) new MyPlate food guidance system recommends that people fill half their plate with fruits and vegetables; specific serving recommendations vary by age, sex, and activity level. (See <http://www.choosemyplate.gov> for more information.)

Awareness of recommendations for fruit and vegetable consumption has increased substantially over the last 20 years. In 1991, about 8% of U.S. adults reported being aware that fruit and vegetable intake should be at least 5 servings a day.⁹ In 2004, that number had increased to 40%.¹⁰ Unfortunately, this heightened awareness has not translated into behavior change. Trends in consumption show that intake of fruit has not changed in the United States since 1988, and intake of vegetables has decreased slightly during this period.¹¹

In a recent analysis of fruit and vegetable intake data that used the MyPyramid recommendations for different groups according to age, sex, and activity level, fewer than 1 in 10 Americans ate enough fruits and vegetables. Among adults, the primary contributor to total fruit intake was whole fruits; among adolescents, it was fruit juices. The largest single contributor to overall fruit intake among adults and adolescents was orange juice.

Potatoes dominated vegetable consumption, particularly among adolescents, where fried potatoes increased the median intake from 0.72 cups to 1.21 cups per day. Dark green and orange vegetables and legumes accounted for a small portion of vegetable intake, and few people met specific recommendations for these vegetable subgroups.¹²

Strategies to increase access and availability of fruits and vegetables should focus on promoting products that maintain the healthy qualities of these foods. Fruits and vegetables can be fresh, frozen, canned, or dried as long as a certain level





of healthfulness is maintained. For example, these foods should be unsweetened, low in sodium, and packed in juice, and fruit juices should be 100% juice.

The 10 strategies described in this guide focus on policy and environmental changes that are designed to increase access to and improve

the availability of fruits and vegetables, with the expectation that these changes will lead to increased consumption. Strategies were selected on the best available evidence, as well as the knowledge and expertise of the authors and Centers for Disease Control and Prevention (CDC) partners.

Strategy 1. Promote food policy councils as a way to improve the food environment at state and local levels

Definition

Food policy councils and other types of food councils provide support and advise residents and governments on how to develop policies and programs to improve local food systems. The goal is to increase access to and the availability of affordable, healthy foods such as fruits and vegetables.

Food policy councils include stakeholders from public, private, and nonprofit sectors. Members represent a wide array of interests, including nutrition, health, agriculture, education, policy, community design, and commerce. They can be commissioned by state, tribal, or local governments; developed at the grassroots level; or created through some combination of the other two approaches.

Rationale

A food policy council is created in a community or state to develop policy related to healthy food access, including fruit and vegetable production, availability, and distribution. Food policy councils develop strategies to provide high-quality and affordable healthy food, including fruits and vegetables, to all members of a community.¹³ They achieve their goals through policy and environmental changes.

Food policy councils have supported policy and program initiatives related to healthy food retail, community and school gardens, food insecurity, farmers' markets and the Farmers' Market Nutrition Program, farm-to-institution and farm-to-school programs, promotion of locally grown foods, and nutrition education.^{14,15} These initiatives have the potential to contribute to changes in individual access to fruits and vegetables, which is a necessary step in influencing consumption.

Evidence of Effectiveness


Peer-reviewed research on the effects of food policy councils on increasing consumption of fruits and vegetables was not found. However, food policy councils have inspired food policy change in many areas, including purchase of local and fresh fruits and vegetables for school

lunches,¹⁵ promotion of sustainable agriculture, and improvements in access to food assistance programs and healthy foods for low-income populations.¹⁶ They also have increased outlets for locally produced farm products, created community and school gardens and farm-to-school education programs,^{14,15} and created new forms of insurance for small producers and farm-to-cafeteria and farm-to-school programs.

A case report from Australia described how the work of a steering committee that included multisector stakeholders (similar to a food policy council) led to significant progress in implementing food and nutrition interventions designed to improve fruit and vegetable consumption over a 1-year period.¹⁷

Key Considerations

- Food policy councils operate at state, regional, and local levels. Development of food policy councils should take into account the level of action needed to make food system changes. A state food policy council should be formed to review the state food system, whereas a city or local community food policy council is a better option to address specific food access issues in a specific city or community.

- 
- Food policy councils can be mandated by government or naturally assembled by interested stakeholders and food system experts. Mandated food policy councils often have a steady stream of funding and paid council members. However, the appointed membership may not fully represent the needs of the local food system. Naturally occurring food policy councils often have knowledgeable, invested members, but they may not have a sustainable source of funding.
 - Once a food policy council is formed, a community food assessment can help members understand what policy and environmental changes might be needed, as well as issues related to fruit and vegetable access among disparate populations (e.g., low-income or minority communities). In 2002, the Community Food Security Coalition published *What's Cooking in Your Food System? A Guide to Community Food Assessment* as a guide on how to conduct community food assessments.
 - Food policy councils provide a key forum for collaboration between public health, sustainability, and planning advocates. They also can broaden the discussion of food and agricultural issues to facilitate a more comprehensive examination of food systems. A food policy council can serve

as a networking and educational tool for individuals in different parts of the food system. As a result, stakeholders become more informed about how individual actions affect local and regional food systems.¹⁵

- Food policy councils help to ensure the sustainability of policy support and program development beyond an initial intervention. They are also a way to build capacity within the community.

Program Examples

Hartford Food System

The City of Hartford Advisory Commission on Food Policy evolved into a group with 15 volunteer members called the Hartford Food System. Ten members are professionals from antihunger organizations, and five members are from the general public. This organization is mandated by the City of Hartford. The commission operates on a \$25,000 budget, partially supported by the City of Hartford and private donations. The majority of this funding is allocated for staff support.

A primary accomplishment of the commission was helping to create the L-tower bus route, which connects communities of lower income

Action Steps

1. Sponsor a conference to provide information about the benefits of food policy councils and training to key players in your local food system.
2. Promote the benefits of food policy councils to state legislators, city and local government officials, or your governor's office and offer to help establish state and local food policy councils in your area.
3. Provide materials on policy and environmental interventions designed to increase access to fruits and vegetables to food policy councils in your area.



more directly to food stores, saving participants an average of 45 minutes of commute time.

Source: Hartford Food System.

Knoxville-Knox County Food Policy Council

Created in 1982, the Knoxville-Knox County Food Policy Council was the first food policy council in the United States. It was started by graduate students at the University of Tennessee and initially funded through a federal food and nutrition grant to develop community garden and food assistance programs. The council expanded to the county level in 2002, and members are now appointed by the mayor of Knoxville or the county executive of Knox County.

Accomplishments of the group include creating 27 community and school gardens and setting up a consulting partnership with the regional transportation authority to encourage officials to consider food access when determining bus routes.

Source: Knoxville-Knox County Food Policy Council.

Oklahoma Food Policy Council

This statewide collaborative entity of private- and public-sector partners is hosted by the Kerr Center for Sustainable Agriculture. Members represent a variety of interests, including farming and ranching, food processing, retail food, education, and the media, as well as tribal, conservation, religious, and antihunger organizations.

When the council was established in 2001, one of its initial projects was to promote foods grown in Oklahoma through farm-to-school programs. The Oklahoma Food Policy Council

was instrumental in helping to create and pass the Oklahoma Farm to School Program Act. The act formalized the successful pilot program, which highlighted seedless Oklahoma watermelons, and expanded the program to more than 400 schools.

The Oklahoma Department of Agriculture is the primary regulating agency. It designated a program administrator to provide leadership and program development, conduct workshops, and offer technical assistance to farmers, food service directors, food processors, and food distributors.

Source: Kerr Center for Sustainable Agriculture.

Resources

Hartford Food System

Learn more about how this coalition connects communities of lower income to food stores.
<http://www.hartfordfood.org>

Knoxville-Knox County Food Policy Council

Learn more about the first food policy council created in the United States.
<http://www.ci.knoxville.tn.us/boards/food.asp>





Oklahoma Food Policy Council

Learn more about this statewide collaborative that promotes farm-to-school programs.
<http://www.kerrcenter.com/ofpc/index.htm>

North American Food Policy Council

Community Food Security Coalition

How-to guides, a sample budget, and a list of current food policy councils that indicates which are mandated or managed by state or local governments.
<http://www.foodsecurity.org/FPC>

Portland Multnomah Food Policy Council

Examples of successful policies and programs.
<http://www.portlandonline.com/osd/index.cfm?c=42290&>

Washington Environmental Priorities Coalition

Learn about a broad-based environmental coalition that promotes local food systems, the use of electronic benefit transfer technology at farmers' markets, and the use of local food in emergency food programs.
<http://www.environmentalpriorities.org/local-farms>

State Indicator Report on Fruits and Vegetables, 2009

Centers for Disease Control and Prevention

Information about fruit and vegetable consumption and policy and environmental support within each state.
http://www.fruitsandveggiesmatter.gov/health_professionals/statereport.html

Counties and Local Food Systems: Ensuring Healthy Foods, Nurturing Healthy Children

National Association of Counties, Center for Sustainable Communities

Case study of a successful food policy council at the county level.
<http://www.foodsecurity.org/FPC/CountiesandLocalFoodSystems.pdf>

Food Policy—Discussion Paper Series

City of Toronto Food Policy Council

Information about a food systems approach to public health policy is found in papers published by the Toronto Food Policy Council, including “Reducing Urban Hunger and Changing Agricultural Policy.”
http://www.toronto.ca/health/tfpc_discussion_paper.htm

What's Cooking in Your Food System? A Guide to Community Food Assessment

Community Food Security Coalition

Report that highlights approaches to completing a community food assessment.
<http://www.foodsecurity.org/CFAguide-whatscookin.pdf>

Drake University Agricultural Law Center: Reports and Publications

Resources from the center's state and local food policy projects.
<http://www.statefoodpolicy.org/?pageID=publications>

Selling to Institutions: An Iowa Farmer's Guide

Drake University Agricultural Law Center

A guide to help farmers understand issues related to institutional purchasing.
<http://www.statefoodpolicy.org/docs/selling.pdf>

Fruits & Veggies—More Matters

Relevant promotional materials and information about licensing the Fruits & Veggies—More Matters brand.
<http://www.fruitsandveggiesmorematters.org>

ENACT

Strategic Alliance

ENACT is an online resource of local policies that provide strategies for healthy eating and active living in seven environments. It includes a hands-on assessment and planning tool.
<http://eatbettermovemore.org/sa/enact/members/index.php>

Strategy 2. Improve access to retail stores that sell high-quality fruits and vegetables or increase the availability of high-quality fruits and vegetables at retail stores in underserved communities

Definition

Food can be sold at a variety of retail stores in a community, including supermarkets, grocery stores, convenience stores, corner stores, and specialty food stores (e.g., fruit and vegetable markets). Improving access to these venues and increasing the availability of high-quality, affordable fruits and vegetables sold there will help increase fruit and vegetable consumption among community members.

These goals can be achieved in a variety of ways, including (1) attracting new food stores to underserved areas through financial incentives, (2) improving public transportation to these stores or influencing business owners to provide transportation for customers, (3) upgrading the facilities at existing stores to enable them to carry all forms of fruits and vegetables, and (4) increasing the supply of and shelf space dedicated to high-quality, affordable fruits and vegetables at existing stores.

Rationale


Neighborhood residents with better access to supermarkets and other retail stores that provide healthful foods tend to have healthier diets, including higher intakes of fruits and vegetables.¹⁸ The research further suggests that residents of rural, minority, and lower-income neighborhoods are more likely to have poor access to supermarkets.¹⁸ Although supermarkets generally offer a wider variety of foods at affordable prices, some have limited shelf space devoted to fresh fruits and vegetables, which limits the food choices of residents. Some neighborhoods do not have supermarkets or other retail stores that sell fruits and vegetables,¹⁹ and some people do not have reliable transportation to travel to areas with these types of stores.^{20,21}

In rural, minority, lower-income neighborhoods, convenience stores and other small grocery or corner stores may be more prevalent than supermarkets.^{22,23} Because these stores generally stock little or no produce because of limited space or equipment and may charge more for what is sold,²⁴ residents of these neighborhoods may have limited access to fruits and vegetables. Improvements in access and availability are necessary steps in creating an environment conducive to adequate fruit and vegetable

consumption. Policy and infrastructure supports that help stores sell more healthy foods provide an opportunity to increase access to and availability of fruits and vegetables. Access to fruits and vegetables at retail food stores can be improved by building and attracting new supermarkets or other retail outlets in underserved areas, improving transportation to stores that provide fruits and vegetables, and increasing the availability of affordable fruits and vegetables at existing stores by improving their supply and upgrading their facilities to offer more healthful foods.

Evidence of Effectiveness

Policy initiatives designed to bring supermarkets to underserved areas have been shown to improve food access and availability in communities. For example, the Pennsylvania Fresh Food Financing Initiative (FFFI), a public-private partnership created in 2004 by the state, helps create new supermarkets and refurbish or replace equipment at existing stores.²⁵ Eligible stores must be located in low- to moderate-income areas that are currently underserved, and they must provide a full selection of fresh foods. In 4 years, the Pennsylvania FFFI funded more than 83 projects across the state involving major national chains and smaller, independently



operated stores. The projects have resulted in the creation or retention of about 5,000 jobs and 1.4 million square feet of retail space. A case study by The Reinvestment Fund, one of the partners in the Pennsylvania FFFI, found that adding a supermarket to an underserved area resulted in improved availability of a variety of healthy foods in the community.²⁶

As part of a retail store intervention in the city of Leeds, England, a major supermarket was built in an area considered to be a “food desert” because access to healthy, affordable food was limited. Evaluation of the Leeds intervention showed no overall effect on fruit and vegetable consumption among community members.²⁷ However, when use of the new store was considered, survey respondents who reported switching to the new store were found to have increased their consumption of fruits and vegetables, while those who did not switch to the new store showed no change in consumption. No similar published evaluations were found on these types of interventions in the United States to assess what effect they might have on people’s fruit and vegetable consumption.

Unpublished evaluations of interventions to improve food retail have shown promising results. For example, evaluation of an intervention to improve fruit and vegetable offerings and promote healthy foods at small ethnic stores (*tiendas* and *bodegas*) found that customers shopping at intervention stores increased their consumption of fruits and vegetables compared with those shopping at nonintervention stores.²⁸ A New York City initiative to address issues of quantity, quality, display, and distribution at *bodegas* showed improvements in quality, quantity, and sales of fresh fruits and vegetables.²⁹

In addition, an evaluation of the Apache Healthy Stores Program, a multicomponent intervention that included stocking healthier food items, found an increase in the purchase of healthy food, including fruits and vegetables, by households located near stores participating in the program.³⁰

No research was found that evaluated the effect of improvements in transportation to retail food outlets on fruit and vegetable consumption. However, studies have shown an association between access and proximity to food outlets and diet. One study found that participants in the federal Food Stamp Program who lived closer or had better access to supermarkets ate more fruits.³¹ A separate study found that greater availability of fresh vegetables within 100 meters of residence was associated with higher vegetable intake,³² and a third study found that proximity to food outlets influenced the diet quality of pregnant women.³³

Key Considerations

- After conducting a community food assessment to determine the accessibility, availability, and affordability of healthy food in specific food environments, different solutions can be considered.





For example,

- ✧ If the assessment shows that food stores lack fruits and vegetables, consider policies, programs, and initiatives that work with retailers and local farmers to increase the availability of affordable produce in the community.
- ✧ If the assessment reveals a lack of food stores, consider community, state, and federal efforts to encourage investment in food stores that provide affordable healthy foods.
- ✧ In addition to permanent retail food stores, venues such as produce vans, mobile carts, and farmers' markets also should be considered for neighborhoods with limited resources.
- Communities can work to recruit more retail food stores to locations that are centrally located or easily accessible by public transportation.²⁷ Other options include working with transportation officials to plan public transit routes to retail food stores and working with

Action Steps

1. Assess the food environments within a community to determine the accessibility, availability, and affordability of healthy food. Start by looking at the USDA's Food Environment Atlas. The USDA's *Community Food Security Assessment Toolkit* and the Michigan Department of Community Health's Nutrition Environment Assessment Tool (NEAT) also include assessment instruments.
2. Provide training to small store owners in your area on how to select, store, and maintain fruits and vegetables. This training also can include information about what equipment is needed to stock perishable items.
3. Sponsor a conference with urban and transportation planners and local officials to discuss and plan for transportation routes that provide better access to healthier food.
4. Help small store owners equip their stores to accept coupons from the federal Supplemental Nutrition Assistance Program (SNAP; formerly known as the Food Stamp Program) and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).
5. Work with a local or regional food policy council on a fresh food financing initiative for your area. These initiatives can provide grants, low-interest loans, and training and technical assistance to improve or establish stores in underserved areas. The federal Healthy Food Financing Initiative brings together many of the resources needed for this effort.
6. Support efforts to inform decision makers about the health benefits of increasing fruit and vegetable accessibility and affordability and about how this goal can be achieved through legislation and state policies that offer retailers incentives to locate in underserved areas. Incentives can include a streamlined development process, tax exemptions and credits, and help with land acquisition. These incentives can be balanced by requirements to devote a certain amount of shelf space to healthy foods.
7. Help existing retail food stores provide transportation options to their customers.
8. Consider healthy food retail when making general community plans and land-use decisions.

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