

# Working with Restaurants: Tips, Examples, Resources & Research

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National Fruit and Vegetable Program Steering Committee  
State, Region and Community Committee  
SRC Restaurant Workgroup

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## Introduction

Over 60 million U.S. adults are classified as obese and approximately 15.3% of 6 to 11 year olds and 15.5% of 12 to 19 year olds are at or above the 95<sup>th</sup> percentile for Body Mass Index-for-Age, which indicates overweight. In the face of this epidemic, there is a pressing need for U.S. children, adolescents, and adults to establish healthy eating and physical activity patterns. Moreover, recent changes in the nutrition environment, including greater reliance on convenience foods and fast foods and a lack of access to fruits and vegetables, may be contributing factors to the overweight and obesity epidemic.

The State, Region and Community Committee (SRC) Restaurant Workgroup compiled these tips and resources to make it easier for public health professionals to work with restaurants and other dining out venues to create healthy food environments in their states and communities.

## ***General tips for working with restaurants***

### **View restaurants and restaurant associations as partners.**

- Discuss the internal processes of the restaurant industry and let them know your process. Industry partners need to be represented at the table from the start – they have the power to become part of the solution.
- State restaurant associations are involved in nutrition projects at varying degrees.
- If the restaurant association is not ready to make changes, individual restaurants may have more freedom in that area.
- Associations can advertise your project in a newsletter that goes out to all members.
- Restaurants or the state association can sit on a committee that is discussing nutrition initiatives in restaurants.
- State associations can be partners in planning state wide chronic disease prevention plans and programs.

### **Have a plan.**

- Set appointments--no more than 20-30 minutes. Managers have tight schedules.
- Be precise and get to the point. What, when, where, how and who? How much, if appropriate!
- Plan for long lead times, especially for large chains. Smaller, regional chains and independents can turn around more quickly.
- What resources can you bring to the partnership?
- What do you expect from the restaurant or restaurant association?
- Define next steps, such as expectations, responsibilities and deadlines.

### **Find the common denominators.**

Nutrition professionals and hospitality industry professionals have overlap in their interests

- Both want to make the customer happy
- Both enjoy people and food
- Both want what is good for the customer
- Both have a lifestyle of service
- Both agree taking part in community activities is important
- Both want to increase the amount of people eating healthy foods (increase customer base, change the norm in restaurants, increase overall health)
- Both feel public perception is important
- On an individual level, many managers and workers are interested in being healthy

### **Understand the differences.**

Both nutrition and industry professionals should make the effort to work collaboratively to understand barriers of each side

- Each has unique challenges
- The goals are different, but not as different as it seems—Public Health works to increase health of the public, hospitality industry works to make the customer happy
- Any intervention or change will be stronger if both parties work together

**Be flexible and persistent.**

- Offer different options for restaurants to participate
- Make a personal connection

**Offer a “hook”.**

- Show the restaurant manager a benefit, such as increased sales or customer traffic, press coverage of activities, or offer a free service
- Share ideas and tips to make healthy products more appealing to customers
- Share examples of successful salads and other produce sales in other restaurants
- Highlight examples of successful healthy options in other community restaurants
- Highlight the importance of offering nutritious foods to the community's well-being—the community connection
- Share results of a community survey indicating that the community is interested in healthier options or menu labeling at restaurants
- Hold a large community event highlighting participating restaurants

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*The restaurant industry divides restaurants into categories.*

**Commercial Restaurant Services**

This group consists of establishments that are open to the public, are operated for profit and may operate facilities and/or supply meal service regularly for others.

**Full service:** an establishment that provides waiter or waitress service where patrons generally pay after they eat; such as fine dining or family dining.

**Limited service:** an establishment that usually does not provide table service; patrons generally order at a cash register or drive-thru window, or select items from a food bar and pay before they eat; such as a quickservice (fast food) restaurant or cafeteria.

**Snack and nonalcoholic service bars:** an establishment that usually does not provide table service; patrons generally order at a cash register or drive-thru window with a very limited menu, such as ice-cream and frozen-custard and yogurt stands, donut shops, bagel shops, coffee shops, cookie shops.

**Noncommercial Restaurant Services**

This group comprises the business, educational, governmental and noncommercial organizations that operate their own restaurant services. Food is provided as an auxiliary service to complement their other activities. Though some establishments operate at a profit, this is not the aim of the restaurant-service activity. Rather, they serve food principally for their own employees, students, patients, etc.

**Military Restaurant Services**

This group comprises the sales of food and beverages at officers' and NCO clubs, military exchanges and defense restaurant service to the troops. This group has been shown separately because most suppliers treat it as a distinct entity for sales purposes.

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*Additionally, a restaurant can be either independent or franchise. Each presents opportunities unique to the type of restaurant. For a franchise restaurant, you may have to contact a manager at the regional level in order to make the right connection, where independent restaurant decisions can usually be made at a more local level.*

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## *Stories from the Field*

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Note: Expect some difficulty accessing the web links cited in the following section, as these links may be temporarily unavailable.

### STATE LEVEL

#### Labeling healthy foods

[www.healthydiningfinder.com](http://www.healthydiningfinder.com) is a national on-line database that lists up to eight healthy menu items in participating restaurants. The consumer searches on the database to find out which restaurants in their area offer healthy foods, and can obtain the nutritional information for the foods that have been identified as healthy. Restaurants pay Healthy Dining for this service and can also use the Healthy Dining logo to label their healthy items.

#### Labeling healthy foods- Winner's Circle

North Carolina's (NC) Winner's Circle is coordinated by NC Prevention Partners, a non-profit association. Their main role is to train and assist local communities, worksites and schools within North Carolina on using the Winner's Circle logo to identify healthy options in their establishments. They also monitor use of the logo, evaluate success stories, help publicize the program, and maintain a website at [www.winnerscirclehealthydining.com](http://www.winnerscirclehealthydining.com). The logo and guidelines are available for other states to use.

#### Partnering with the state restaurant association

The Wisconsin Restaurant Association (WRA), a member of the Wisconsin Partnership for Activity and Nutrition, implements a Healthy Lifestyles Initiative and Dining Guide. They developed icons relating to health, such as non-smoking, low-salt, vegetarian items available. Restaurants report to the WRA which icons to post next to their information on the website: [www.wirestaurant.org/news/obesity/index.cfm](http://www.wirestaurant.org/news/obesity/index.cfm).

#### Presenting at a regional restaurant show

Restaurant Supply Shows generally have some break-out sessions that can deliver information or skill-building around healthy foods. For example, at the 2007 Northwest Restaurant Show, local and national experts discussed how and why to transition from trans-fats to healthier options. Two breakout sessions showed new techniques for cooking and displaying vegetables.

#### Rewarding healthy restaurants

The Healthy Arkansas Healthy Restaurant Award recognizes restaurants that have gone the extra mile to assist Arkansans in living a healthy lifestyle even when they eat out. The award is given to restaurants that meet high standards in food safety, nutrition and smoke-free environment criteria. The criteria and awardees are listed on their website: [www.arkansas.gov/ha/healthy\\_restaurant.html](http://www.arkansas.gov/ha/healthy_restaurant.html).

### LOCAL LEVEL

#### "Healthy Taste of Town" event

A restaurant member of a local Supper Club in Wisconsin hosted a "Healthy Lifestyles Fair" at its restaurant/banquet hall. Local businesses displayed products or services related to healthy lifestyles and restaurants had samples of their healthy fare. Tickets were available to the general public for \$25. The town's hospital had a booth promoting their healthy lifestyles program. The Wisconsin Restaurant Association had a booth to publicize their Healthy Restaurant Initiative.

### **Implementing legislation**

After a year-long awareness campaign to help restaurants switch from cooking with trans fats to cooking trans fat free did not result in significant changes in the food supply, the New York City Board of Health banned trans fats from restaurants. The use of trans fats will be phased out over time. The effort includes a technical assistance website for restaurants that need to make the switch. *See Resources for more information.*

### **Labeling healthy foods**

Several local programs (in Massachusetts, Washington, and Maryland) partner with local dining out venues to label the healthy items and modify menu items to meet certain nutrition criteria. Here are some steps they have followed:

1. Establish criteria for healthy meals. *See web resources below for examples of healthy meal criteria.*
2. Contact restaurants in the area via mail and ads in a local industry magazine.
3. Visit the restaurants that volunteer, then work with staff to analyze items already on the menu and figure out which may be modified. Several local projects use either hospital dietitians or dietetic interns to assist in the analyses. Other projects contract with a local dietitian to do the analysis.
4. The facility gets a logo and the food item gets a special symbol that means "healthy."
5. The facility markets the program and the local health department manages the program.

### **Partnering with community**

For National Nutrition Month, Washington State, Tacoma-Pierce County Health Department, a local hospital, and local restaurants partner to highlight healthy options in local restaurants. Hospital dietitians and participating restaurant's chefs select an existing menu item and tailor it to make it more nutritious. When a guest orders the featured Get Fit entrée, he or she receives a free guest pass to workout at any Tacoma-Pierce County YMCA. If the guest is already a Y member, he or she receives 10% off the price of the featured menu item. Participating restaurants are advertised on a website. *See Resources for healthy meal criteria.*

### **Promoting fruits and vegetables**

California has partnered with restaurants through its Children's 5 a Day—Power Play! Campaign primarily at the local level, initiated and implemented by the 5 a Day Campaign's regional lead agencies and their restaurant partners. For example, in the Tri-county/Kern Region, six local restaurants participated in the Eat Out Smart Project. To participate in the project, each restaurant agreed to substitute, upon a customer's request, a fruit cup or a side of vegetables for a regular side dish. Restaurant managers also agreed to display colorful table tents and distribute a 5 A Day gift bag to families with children every weekend for one month.

### **Working with a franchise to label healthy menu options**

The Smart Meal program was developed by Colorado Physical Activity and Nutrition Program (COPAN) and the Colorado Department of Public Health and Environment. The purpose of the Smart Meal program is to 1) Provide wholesome menu options for customers, 2) Provide education and awareness of Smart Meal qualifications, 3) Encourage customers to make healthier choices, 4) Understand how to lead a more balanced, active lifestyle. Recently, COPAN partnered with McDonald's franchises in Denver on a Smart Meals pilot. They worked together to create meal combinations that meet the nutrition criteria. McDonald's designed and printed tray liners and signs to market the healthy meal combinations and trains line staff on inputting Smart Meals into their ordering system. *See Resources for Smart Meal Seal criteria.*

### **Working with the local chapter of the restaurant association**

In Los Angeles County, CA city and county officials reached an agreement with the local chapter of the California Restaurant Association to voluntarily phase out trans fats within 18 months.

## Resources

Note: Expect some difficulty accessing the web links cited in the following section, as these may be temporarily unavailable.

Topic	Resource
Assessment tools	<p>Connecticut Healthy Eating Active Living Toolkit (page 6, #11)  <a href="http://www.cthanded.org/HEALRT/HEAL_Tool_22April05.pdf">http://www.cthanded.org/HEALRT/HEAL_Tool_22April05.pdf</a></p> <p>Fast Food Restaurant Survey, Restaurant Menu Coding Survey, 5 A Day the California Way Restaurant Checklist  <a href="http://socialmarketing-nutrition.ucdavis.edu/Tools/SomarkToolsList.php?key_m=3">http://socialmarketing-nutrition.ucdavis.edu/Tools/SomarkToolsList.php?key_m=3</a></p> <p>Healthy Communities Toolkit: Appendix D: Eating Establishments  <a href="http://www.doh.wa.gov/cfh/NutritionPA/pdf_files/highrez/physical-enviro_highrez.pdf">http://www.doh.wa.gov/cfh/NutritionPA/pdf_files/highrez/physical-enviro_highrez.pdf</a></p> <p>Michigan Nutrition Environment Assessment Tool <a href="http://www.mihealthtools.org/neat/NEAT_Print_Version.pdf">http://www.mihealthtools.org/neat/NEAT_Print_Version.pdf</a></p> <p>Nutrition Environment Measures Survey <a href="http://www.sph.emory.edu/NEMS/in2.htm">http://www.sph.emory.edu/NEMS/in2.htm</a></p>
Fruit and vegetable marketing	<p>Fruit and vegetable health claim <a href="http://www.pbhfoundation.org/retail/nutritionmktg/dietary_guide_statement.php">http://www.pbhfoundation.org/retail/nutritionmktg/dietary_guide_statement.php</a></p> <p>Fruit and Veggie Tips for Commercial Foodservice <a href="http://www.pbhfoundation.org/foodservice/commercial/marketpromo/index.php">http://www.pbhfoundation.org/foodservice/commercial/marketpromo/index.php</a></p> <p>Produce First <a href="http://www.pbhfoundation.org/foodservice/commercial/events/">http://www.pbhfoundation.org/foodservice/commercial/events/</a></p>
Healthy meal criteria	<p>Colorado Smart Meal Seal <a href="http://www.livewellcolorado.com/assets/SmartMealOne_Page.doc">http://www.livewellcolorado.com/assets/SmartMealOne_Page.doc</a></p> <p>Fruits &amp; Veggies—More Matters™ Products Promotable Criteria  <a href="http://www.fruitsandveggiesmatter.gov/health_professionals/program_guidelines.html">http://www.fruitsandveggiesmatter.gov/health_professionals/program_guidelines.html</a></p> <p>National Healthy Dining Finder <a href="http://www.healthydiningfinder.com">www.healthydiningfinder.com</a></p> <p>North Carolina Winners Circle Healthy Dining Program <a href="http://www.winnerscirclehealthydining.com/">http://www.winnerscirclehealthydining.com/</a></p> <p>Pierce County (Washington) Get Fit Dining Out <a href="http://www.multicare.org/cgi-bin/multicare.dll/multicare/sub2.do?channelName=Pierce%20County%20Gets%20Fit/Get%20Fit%20Dining%20Out&amp;theme=1">http://www.multicare.org/cgi-bin/multicare.dll/multicare/sub2.do?channelName=Pierce%20County%20Gets%20Fit/Get%20Fit%20Dining%20Out&amp;theme=1</a></p>
Menu labeling	<p>Centers for Disease Control Nutrition and Physical Activity Database  <a href="http://apps.nccd.cdc.gov/DNPALeg/">http://apps.nccd.cdc.gov/DNPALeg/</a> (enter search term "menu")</p> <p>Center for Science in the Public Interest- Health advocacy perspective on menu labeling  <a href="http://cspinet.org/nutritionpolicy/index.html">http://cspinet.org/nutritionpolicy/index.html</a></p> <p>FDA Food Labeling Questions &amp; Answers: <i>Volume 2, A Guide for Restaurants and Other Retail Establishments</i>  <a href="http://www.cfsan.fda.gov/~frf/gainro.html">http://www.cfsan.fda.gov/~frf/gainro.html</a></p>

	<p><b>NRA Ask Us!</b> This program was developed by the National Restaurant Association to assist restaurant operators in their efforts to provide nutrition information.  <a href="http://www.restaurant.org/nutrition/askus/index.cfm">http://www.restaurant.org/nutrition/askus/index.cfm</a></p> <p><b>Nutrient Data Information: USDA Nutrient Databank</b> <a href="http://www.ars.usda.gov/main/site_main.htm?modecode=12354500">http://www.ars.usda.gov/main/site_main.htm?modecode=12354500</a></p> <p><b>National Restaurant Association Legislative Page-</b> Restaurant industry perspective on menu labeling  <a href="http://www.restaurant.org/government/state/nutrition/index.cfm">http://www.restaurant.org/government/state/nutrition/index.cfm</a></p>
Nutrition education resources	<p><b>American Diabetes Association: Your Guide to Eating Out</b> <a href="http://www.diabetes.org/nutrition-and-recipes/nutrition/eatingoutguide.jsp">http://www.diabetes.org/nutrition-and-recipes/nutrition/eatingoutguide.jsp</a></p> <p><b>American Dietetic Association</b> <a href="http://www.eatright.org">www.eatright.org</a></p> <p><b>Fruits &amp; Veggies—More Matters!</b> <a href="http://www.fruitsandveggiesmorematters.org">http://www.fruitsandveggiesmorematters.org</a> ; <a href="http://www.fruitsandveggiesmatter.gov">http://www.fruitsandveggiesmatter.gov</a></p> <p><b>Healthier US</b> <a href="http://www.healthierus.gov/nutrition.html">http://www.healthierus.gov/nutrition.html</a></p> <p><b>Healthy Eating Out Guide – American Heart Association</b> <a href="http://www.americanheart.org/presenter.jhtml?identifier=531">http://www.americanheart.org/presenter.jhtml?identifier=531</a></p> <p><b>My Pyramid</b> <a href="http://mypyramid.gov">http://mypyramid.gov</a></p> <p><b>Nutrition.gov</b> <a href="http://nutrition.gov/">http://nutrition.gov/</a></p>
Nutrition promotion programs other than menu labeling	<p><b>Healthy Arkansas</b> <a href="http://www.arkansas.gov/ha/healthy_restaurant.html">http://www.arkansas.gov/ha/healthy_restaurant.html</a></p> <p><b>Whole Grains Restaurant Challenge</b> <a href="http://www.wholegrainscouncil.org/RestaurantChallenge.html">http://www.wholegrainscouncil.org/RestaurantChallenge.html</a></p> <p><b>Wisconsin Restaurant Association Dining Guide</b> <a href="http://www.wirestaurant.org/search/dining/index.cfm">http://www.wirestaurant.org/search/dining/index.cfm</a></p>
Partnering with local government	<p><b>Government Planners</b> <a href="http://www.planning.org/policyguides/food.htm">www.planning.org/policyguides/food.htm</a>,</p> <p><b>Local Government</b> <a href="http://www.icma.org/upload/library/2006-09/%7b5CD4101C-2803-4655-9A51-465461B3C897%7d.pdf">http://www.icma.org/upload/library/2006-09/%7b5CD4101C-2803-4655-9A51-465461B3C897%7d.pdf</a></p>
Trans fat	<p><b>Centers for Disease Control Nutrition and Physical Activity Database</b>  <a href="http://apps.nccd.cdc.gov/DNPALeg/">http://apps.nccd.cdc.gov/DNPALeg/</a> (enter search term “trans fat”)</p> <p><b>No Trans Fat Help Center</b> <a href="http://www.citytech.cuny.edu/notransfatnyc/">http://www.citytech.cuny.edu/notransfatnyc/</a></p> <p><b>New York City Trans Fat Ban</b> <a href="http://www.nyc.gov/html/doh/html/cardio/cardio-transfat.shtml">http://www.nyc.gov/html/doh/html/cardio/cardio-transfat.shtml</a></p>

## Introduction to the Literature Review

Rates of consuming foods away from home have continued to increase over the last decade and are associated with a higher caloric content and lower nutrient density. Thus, the SRC Restaurant Work Group sought to learn more about the impact of away from home foods on overweight and obesity prevention.

Included is a review of strategies that can be used to increase access to healthy foods, including fruit and vegetables, when dining out. The SRC Restaurant Workgroup reviewed the existing literature as it relates to the questions below.

[In light of the obesity epidemic, is there merit in working with restaurants?](#)

[Do changes in the restaurant environment \(such as point of decision prompts, pricing, or menu labeling\) influence consumer behavior?](#)

[Is there consumer support for nutrition labeling in restaurants?](#)

[How does serving preparation and presentation in restaurants \(including portion sizes, variety and course offerings\) influence the intake of consumers?](#)

[How can we feasibly assess the restaurant environment and measure the changes that are made in restaurants?](#)

### SRC RESTAURANT WORKGROUP RESTAURANT-BASED LITERATURE REVIEW

**General Restaurant Research:** The following research highlights the relationship between dietary intake, obesity, and eating away from home foods. This section also explores the frequency of dining out, patterns of eating and dietary quality of away from home foods, general marketing practices in restaurants, and location/access to away from home foods.

CITATION	DESCRIPTION
Austin SB, Melly SJ, Sanchez BN, Patel A, Buka S, Gortmaker SL. Clustering of fast-food restaurants around schools: a novel application of spatial statistics to the study of food environments. Am J Public Health 2005; 95:1575-81.	<ul style="list-style-type: none"> <li>• Sample: N=1292 schools and N=613 fast food restaurants within Chicago, IL</li> <li>• Design: Cross-sectional analysis</li> <li>• Measures: Mean and median distance from schools to the nearest fast-food restaurant, number of fast-food restaurants located within 400 and 800 m radius buffers, degree of clustering of fast-food restaurants around school locations from 0-1.5 km from schools</li> <li>• <b>Conclusion:</b> 80% of schools had at least 1 fast-food restaurant within 800 m. Statistically significant clustering of fast-food restaurants was found within 1.5 km of schools outside of the downtown area and around schools in the high- and moderate-commercialization regions of the city. Fast-food restaurants are concentrated within a short walking distance from schools exposing children to poor-quality food environments in their school neighborhoods.</li> </ul>

<p>Block JP, Scribner RA, DeSalvo KB. Fast food, race/ethnicity, and income: a geographic analysis. <i>Am J Prev Med</i> 2004; 27:211-17.</p>	<ul style="list-style-type: none"> <li>• Sample: There were 156 fast food restaurants within the city limits of New Orleans, LA that were examined to determine predominance in black and white neighborhoods.</li> <li>• Design: Cross-sectional analysis</li> <li>• Measures: Using multiple regression analyses, this study analyzes the geographic association between fast food restaurant density and black and low-income neighborhoods while controlling for environmental confounders that may influence the placement of restaurants.</li> <li>• <b>Conclusion:</b> Predominantly black neighborhoods have 2.4 fast-food restaurants per square mile compared to 1.5 restaurants in predominantly white neighborhoods. Therefore, the link between fast food restaurants and black and low-income neighborhoods may contribute to the understanding of environmental causes of the obesity epidemic in these populations.</li> </ul>
<p>Bowman SA, Vinyard BT. Fast food consumption of US adults: impact on energy and nutrient intakes and overweight status. <i>J Am Coll Nutr</i> 2004;23:163-68.</p>	<ul style="list-style-type: none"> <li>• Sample: The sample included 9,872 adults, ages 20 and over</li> <li>• Design: Three separate food surveys were collected on various days between 1994-1996. Those who filled out at least two of the three were included in the study. The study was used to compare the diet quality and overweight status of free-living adults, aged 20 years and older, based on their fast food consumption.</li> <li>• Measures: Fast food consumption and what nutrients are associated with it.</li> <li>• <b>Conclusion:</b> Fast food consumption was associated with a diet high in energy and energy density and low in essential micronutrient density. Frequent fast food consumption may contribute to weight gain.</li> </ul>
<p>Clemens LH, Slawson DL, Klesges RC. The effect of eating out on quality of diet in premenopausal women. <i>J Am Diet Assoc</i> 1999;99:422-44.</p>	<ul style="list-style-type: none"> <li>• Sample: N=129 pre-menopausal women recruited from a mid-southern US city.</li> <li>• Design: One-week descriptive study of dietary intake in women, in which subjects completed daily diet records that included the source of food eaten and where it was consumed.</li> <li>• Measures: The total energy, fat, protein, carbohydrate, sodium, fiber, and calcium intake for all foods consumed and how nutrient intake varies depending on where food is consumed and the number of times a person eats away from home.</li> <li>• <b>Conclusion:</b> Women who report eating out a greater number of times per week report more total energy intake as well as higher fat and sodium intakes. However, this group did not consume significantly more fiber or calcium in the extra energy consumed.</li> </ul>
<p>Gillis L, Or-Bar O. Food Away from Home, Sugar-Sweetened Drink Consumption and Juvenile Obesity. <i>Journal of the American College of Nutrition</i>. 2003;22:539-545.</p>	<ul style="list-style-type: none"> <li>• Sample: N = 91 obese children/adolescents and N =90 non-obese children/adolescents (control)</li> <li>• Study Design: Cross-sectional analysis</li> <li>• Measures: Food intake (via dietary history by RD), body fat (by bioelectrical impedance analysis)</li> <li>• <b>Conclusions:</b> Obese children and adolescents consumed more meat, grain products, food away from home, sugar-sweetened beverages, and potato chips than non-obese children and adolescents. Consumption of meat, sugar-sweetened beverages, and food away from home is positively correlated with percent body fat.</li> </ul>
<p>Guthrie JF, Lin BH, Frazao E. Role of food prepared away from home in the American diet, 1977-78 versus 1994-1996: changes and consequences. <i>J Nutr Ed Behav</i> 2002;34:140-50.</p>	<ul style="list-style-type: none"> <li>• Sample: Individuals 2 years of age and over N=43,988</li> <li>• Design: In this retrospective analysis, data were obtained from nationwide surveys of food consumption by the US Department of Agriculture (USDA) in 1977-78 and 1994-95, using "day 1" dietary data, which both surveys collected via 24-hour recall.</li> <li>• Measures: Foods categorized by preparation at home or at restaurants, fast-food establishments, schools/day care, and other non-home locations. Next, determines percent calories from total and saturated fat, cholesterol, sodium, fiber, calcium, and iron densities of food were compared between those prepared at home versus those prepared away from home.</li> <li>• <b>Conclusion:</b> Between 1977-78 and 1994-96, consumption of food prepared away from home increased from 18% to 32% of total calories. Meals and snacks prepared away from home contained more calories per eating occasion and "away" food was higher in total fat and saturated fat on a per-calorie basis than "at-home" food. "Away" food also contained less dietary fiber, calcium, and iron, and more sodium cholesterol than "at-home" foods.</li> </ul>

<p>Jeffery RW, French SA. Epidemic obesity in the United States: are fast foods and television contributing? Am J Public Health 1998;88:277-80.</p>	<ul style="list-style-type: none"> <li>• Sample: 198 men, 529 high-income women, and 332 low-income women. All were 20-45 years of age, in good health, not pregnant in the year prior to or following study enrollment, and attended both the baseline and follow-up examinations.</li> <li>• Design: This was a prospective analysis designed to explore the relationship between fast food consumption, TV viewing, and body weight in adults.</li> <li>• Measures: Data from three demographic groups were obtained (1) age in years, (2) education, (3) current marital status, (4) ethnicity, (5) smoking status, (6) total energy intake per day, and (7) percentage of energy from fat.</li> <li>• <b>Conclusion:</b> High-income women and men; average age 35 years, were primarily White, highly educated, with low smoking rates, and BMIs slightly higher than population average. Low-income women were younger, less likely to be married, less educated, heavier, and more likely to smoke. TV viewing was not related to energy or fat intake for men. Viewing was, however, positively related to energy intake in both high- and low-income women and to percentage of energy from fat in low-income women. Number of fast food meals eaten per week was positively associated with total energy intake and percentage of energy from fat in all three groups. Number of fast food meals eaten per week was negatively associated with exercise in low-income women. The association between fast food eating, TV viewing, and BMI showed no significant association in men. The relationship between fast food eating and TV viewing was positively associated with BMI for all women. It was strongest among low-income women.</li> </ul>
<p>Forum Review. The Keystone Center. The Keystone Forum on Away-From-Home Foods: Opportunities for Preventing Weight Gain and Obesity. Washington, DC; 2006.</p>	<ul style="list-style-type: none"> <li>• Sample: Requested and funded by the U.S. Food and Drug Administration, the forum brought together a diversity of participants including industry, government agencies, civic-sector organizations, and academia.</li> <li>• Design: Review and Synthesis of Literature; Debate of Perspectives</li> <li>• Measures: N/A</li> <li>• <b>Conclusion:</b> Selected recommendations made by the forum include: <ul style="list-style-type: none"> <li>• Promote low-calorie-dense dietary patterns.</li> <li>• Strengthen and/or create education and promotion programs regarding away-from-home foods that promote the consumption of fruits, vegetables, nonfat and low-fat milk and milk products, whole grains, and foods low in saturated fats and trans-fatty acids.</li> <li>• Foodservice providers should develop and promote portion-size, plate composition, and menu-pairing options that help consumers in their efforts to manage their energy intake.</li> <li>• Provide more options and promote meal bundles with fruits and vegetables (including salads), while maintaining traditional side options as well.</li> <li>• Foodservice providers should develop, make available, and promote beverage options that help consumers to reduce caloric intake. Increase the selection of low-fat or nonfat milk beverages, especially with children's meals.</li> <li>• Industry and academia should conduct research collaboratively.</li> <li>• A specific survey should be conducted about the experiences of operators and restaurateurs in developing menu items that could aid in weight management.</li> <li>• A recent report produced by the FDA entitled, "Calories Count: Report of the Working Group on Obesity," highlighted the importance of considering away-from-home foods in efforts to control obesity.</li> </ul> </li> </ul>
<p>Glanz K, Resnicow K, Seymour J, et al. How major restaurant chains plan their menus: the role of profit, demand and health. American</p>	<ul style="list-style-type: none"> <li>• Sample: 41 senior menu development and marketing executives at leading casual dining and fast-food restaurant chains</li> <li>• Design: Cross-sectional analysis</li> <li>• Measures: in-depth structured telephone interviews (including menu trends, influences on introduction and continuation of new menu items, and barriers to adding healthy food)</li> <li>• <b>Conclusion:</b> Profit margins are the primary determinants of why restaurants either do add; do not add and/or continue to</li> </ul>

Journal of Preventive Medicine, 2007 (32):383-388.	serve healthier food options. Without an increase in consumer demand, it is unlikely the restaurant industry will increase their offering of healthy food choices.
Kipke MD, Iverson E, Moore D. Food and Park Environments: Neighborhood-level Risks for Childhood Obesity in East Los Angeles. Journal of Adolescent Health, 2007 (40):325-333.	<ul style="list-style-type: none"> <li>• Sample: An East LA neighborhood (one zip code) with one of highest obesity rates in LA, 4.4 square miles, 68,688 people, 95% Hispanic, 41% less than 9<sup>th</sup> grade education, 19% with high school diploma, median annual income \$27,471</li> <li>• Design: Spatial analysis, ethnographic observations</li> <li>• Measures: density and proximity of food establishments to schools, ethnographic observations of availability and quality of f&amp;v, meat, and dairy in grocery stores, availability and quality of local parks</li> <li>• <b>Conclusion:</b> 190 food establishments: 49% fast food, 64% within walking distance of school. 62 grocery stores, 18% sold fresh f and/or v of good quality: 4 within walking distance of a school.</li> </ul>
Lewis LB, Sloan DC, Nascimento LM, et al. African Americans' access to healthy food options in south Los Angeles restaurants. Am J Public Health 2005;95:668-73.	<ul style="list-style-type: none"> <li>• Sample: 659 restaurants in LA county, N=348 restaurants in target area (less affluent) and N=311 restaurants in the comparison area (more affluent)</li> <li>• Design: Cross-sectional analysis</li> <li>• Measures: Assessed availability, quality and preparation of food in restaurants based on the menu; assessed advertisements, promotions, cleanliness and quality of service</li> <li>• <b>Conclusion:</b> Poorer neighborhoods with a higher proportion of African Americans have fewer healthy options available in food selection and preparation; the restaurants in this area heavily promote unhealthy food options to residents.</li> </ul>
Lin BH, Guthrie JF, Blaylock JR. Diets of America's Children: Influence of Dining Out, Household Characteristics, and Nutrition Knowledge, Agricultural Economic Report #746. Washington, DC: USDA; 1996. <a href="http://www.ers.usda.gov/Publications/AER746/">http://www.ers.usda.gov/Publications/AER746/</a>	<ul style="list-style-type: none"> <li>• Sample: N=48 contiguous states, private households, 3,010 children aged 2-17</li> <li>• Study Design: Review of Continuing Survey of Food Intakes by Individuals (CSFII) 1989-91 and Diets and Health Knowledge Survey 1989-91</li> <li>• Measures: Participants provided dietary data for 3 consecutive days of Social, economic, and demographic characteristics of survey participants are also included in the CSFII</li> <li>• <b>Conclusion:</b> Children's diets were high in total fat, saturated fat, and sodium while low in food energy and fiber. Of the children surveyed, their diets contained 34% of their total calories came from total fat, 13% from saturated fat and 2,948 mg of sodium. Most female adolescents surveyed consumed diets high in total fat, saturated fat and sodium and this population also had the highest tendency to skip morning meals, ate fewer snacks and had the largest portion of meals and snacks away from home. In total, away-from-home foods (food prepared away from home) had higher levels of total fat, saturated fat and lower levels of cholesterol, dietary fiber, calcium, iron and fiber compared to at home foods (food prepared at home).</li> </ul>
Maddock J. The relationship between obesity and the prevalence of fast food restaurants: state-level analysis. American Journal of Health Promotion 2004; 19:137-43.	<ul style="list-style-type: none"> <li>• Sample: N = 50 states</li> <li>• Study Design: Cross-sectional analysis</li> <li>• Measures: Square miles per fast food restaurant, population per fast food restaurant, demographics: ethnicity, age, gender, physical inactivity, F&amp;V intake, obesity rate (obtained from 2002 BRFSS and 2000 U.S. Census), assessment method: one-time analysis of secondary data</li> <li>• <b>Conclusions:</b> Multiple hierarchical regressions revealed that square miles per fast food restaurants and residents per restaurant accounted for 6% of the variance in state obesity rates after controlling for population density, ethnicity, age, gender, physical inactivity, and fruit and vegetable intake.</li> </ul>
McCrorry MA, Fuss PJ, Hays NP, Vinken AG, Greenberg AS, Roberts SB. Overeating in America: association between restaurant food	<ul style="list-style-type: none"> <li>• Sample: 73 men and women, ages 19 to 80, body mass index 18 to 33.</li> <li>• Design: Typical free-living dietary intake and frequency of seven different restaurant types, including fried chicken, burger, pizza, Chinese, Mexican, fried fish, and "other."</li> <li>• Measures: Food frequency questionnaire and hydrostatic weighing. Also physical activity and other lifestyle parameters were assessed by questionnaire.</li> </ul>

<p>consumption and body fatness in healthy adult men and women ages 19 to 80. <i>Obes Res</i> 1999;7:564-71.</p>	<ul style="list-style-type: none"> <li>• <b>Conclusion:</b> Restaurant food consumption averaged 7.5+/-8.5 times/month. After controlling for age and sex, the frequency of consuming restaurant food was positively associated with body fatness (partial <math>r=0.36</math>, <math>p=0.003</math>). The strength of this association did not change after controlling for education level, smoking status, and alcohol intake, but after controlling for physical activity, the partial <math>r</math> increased to 0.42 (<math>p=0.004</math>). Total daily intakes of energy, fat, and fiber were significantly associated with restaurant food consumption frequency (<math>r=0.59, 0.28</math>, and <math>-0.45</math>, respectively, <math>p=0.02</math> to <math>0.0001</math>).</li> </ul>
<p>Pereira MA, Kartashov A, Ebbeling C, et al. Fast-food habits, weight gain, and insulin resistance (the CARDIA study): 15-year prospective analysis. <i>Lancet</i> 2005;365:36-42.</p>	<ul style="list-style-type: none"> <li>• Sample: 3031 young (age 18-30 years in 1985-86) black and white adults</li> <li>• Design: In this prospective analysis, participants were followed over a 15-year period with repeated dietary assessments to investigate the association of fast-food consumption and changing body weights and insulin resistance.</li> <li>• Measures: This study compares the black and white populations and genders, to determine which group is eating the most fast-food at baseline and how it affects changing body weight and insulin resistance over the next 15 years.</li> <li>• <b>Conclusion:</b> Fast food frequency is lowest for white women (1.3 times/wk) compared with other ethnic-sex groups (2 times/wk). Change in fast-food frequency over 15 years was directly associated with changes in body weight in white individuals, with a weaker association recorded in black people. Change in fast-food frequency over 15 years was directly associated with insulin resistance in both ethnic groups. Those who consumed fast-food more than twice per week at baseline and follow up gained an extra 4.5 kg of body weight and had a two-fold greater increase in insulin resistance.</li> </ul>
<p>Sneed J, Burkhalter JP. Marketing nutrition in restaurants: a survey of current practices and attitudes. <i>JADA</i> 1991;459:62.</p>	<ul style="list-style-type: none"> <li>• Sample: N=70 Research and Development Directors of restaurant companies in the Restaurants and Institutions' listing of the top 400 foodservice organizations from 1987 sales figures (200 were mailed the questionnaire)</li> <li>• Design: Cross-sectional survey</li> <li>• Measures: A written questionnaire addressing current nutrition marketing practices, sources of nutrition information, how sales of special nutritious items were promoted, and type of training given to staff.</li> <li>• <b>Conclusion:</b> Most of the Research and Development Directors did not feel it was their responsibility to improve the health of their customers. There was a positive relationship between nutrition attitudes and marketing practices. This is an area where RD's skills are useful. 12 reported employing a RD and 14 reported consulting a RD.</li> </ul>
<p>Thompson OM, Ballew C, Resnicow K, et al. Food purchased away from home as a predictor of change in BMI Z-score among girls. <i>Int J Obes</i> 2004;28:282-89.</p>	<ul style="list-style-type: none"> <li>• Sample: Healthy girls (n=101) between the ages of 8 and 12 years at baseline and 11 and 19 years of age at follow-up</li> <li>• Design: Participants kept 7-day dietary records at two points in time, which included the place and time for all foods consumed. Researchers recorded how often participants ate food purchased away from home (FAH), calculated the percent of total energy derived from FAH, and classified foods as quick-service food, coffee-shop food, or restaurant food.</li> <li>• Measures: This prospective analysis of variance was used to assess the relationship between change in BMI z-score and both the frequency of eating FAH and the energy derived from eating FAH. Participants' baseline BMI z-score was controlled in both models and the kappa coefficient was used to assess FAH tracking.</li> <li>• <b>Conclusion:</b> The frequency of eating quick-service food at baseline was positively associated with change in BMI z-score. Participants who ate quick-service food at least twice a week had the greatest mean increase in BMI z-score.</li> </ul>
<p>Zoumas-Morse C, Rock CL, Sobo EJ, Neuhauser ML. Children's patterns of macronutrient intake and associations with restaurant and home eating. <i>J Am Diet Assoc</i> 2001;101:923-925.</p>	<ul style="list-style-type: none"> <li>• Sample: A sample of 367 children (aged 7 to 11 years) and 435 adolescents (aged 12 to 17 years) were recruited as part of a larger project, the Olestra Post-Marketing Surveillance Study.</li> <li>• Design: This cross-sectional study monitored adoption and patterns of use of olestra-containing foods in representative samples of the US population in Baltimore, MD; Indianapolis, IN; Minneapolis, MN; and San Diego, CA. Participants must be English-speaking and were recruited through random-digit dialing; up to two minors per household could participate.</li> <li>• Measures: Analyzed energy and macronutrient intake between gender or age sub-groups to determine how the dietary habits of various children and adolescents compare.</li> <li>• <b>Conclusion:</b> Mean estimates for percent energy from fat (31%) and saturated fat (11%) across age and gender were slightly</li> </ul>

	<p>higher than current dietary recommendations. Restaurant meals accounted for only 6% of all reported eating; however, energy content of restaurant meals was 55% higher than the average energy intake of home-based eating occasions (P&lt;.05). Children and adolescents consumed significantly more energy from fat and saturated fat when eating at a restaurant compared to any other location (P&lt;.05). Findings indicated that children and adolescents consume more fat and saturated fat when eating at restaurants compared to home or school.</p>
<p><b>Restaurant-Based Intervention Strategies (including point of decision prompts, nutrition labeling and pricing):</b> The following research highlights various interventions conducted in restaurant and cafeteria settings. This section reviews the evidence base for key intervention strategies and explores successes and lessons learned related to each.</p>	
CITATION	DESCRIPTION
<p>Almanza BA, Nelson D, Chai S. Obstacles to nutrition labeling in restaurants. J Am Diet Assoc 1997;97:157-61.</p>	<ul style="list-style-type: none"> <li>• Sample: 68 Research and Development Directors of the 400 largest foodservice corporations</li> <li>• Design: Cross-sectional survey</li> <li>• Measures: Survey questions asked directors/representatives to rate, on a scale of 1-7, obstacles to nutrition labeling in their restaurant (categories: personnel, recipe, government, purveyors, menu, and cost). Also, responders were asked to rate willingness to do nutrition labeling on a 1-10 scale. Those surveyed were also asked if they felt it was their responsibility to provide nutrition facts for customers.</li> <li>• <b>Conclusion:</b> Food service companies are, overall, neutral about willingness to incorporate nutrition labeling. About 33% thought it was their responsibility to provide nutrition labeling. The major obstacles respondents faced were menu related (lack of physical menu space, decrease in menu flexibility, too many menu variations), personnel (lack of time to train, expense), and cost overall.</li> </ul>
<p>Birnbaum AS, Lytle LA, Story M, Perry CL, Murray DM. Are differences in exposure to a multicomponent school-based intervention associated with varying dietary outcomes in adolescents? Health Education &amp; Behavior 2002;29:427-43.</p>	<ul style="list-style-type: none"> <li>• Sample: N=16 schools, a cohort of 7<sup>th</sup> graders followed through 8<sup>th</sup> grade.</li> <li>• Design: Group-randomized trial design. 4 groups: control group, school environment interventions only, classroom plus environment interventions and peer leaders plus classroom plus environment interventions</li> <li>• Measures: Usual F and V intake was measured using a modified version of the BRFSS measure. Included six items on the frequency of consuming fruit juices, fruit, green salad, potatoes, carrots and vegetables. Assessed usual food choices and hypothesized psychosocial mediators of eating behavior change</li> <li>• <b>Conclusion:</b> Peer leaders reported the largest increase in fruit, vegetable and lower fat food consumption. Students exposed to classroom plus environment interventions also improved. Students only exposed to school environment interventions showed trends toward choosing lower fat foods and declining fruit intake and no change in vegetable intake.</li> </ul>
<p>Buscher LA, Martin KA, Crocker S. Point-of-purchase framed in terms of cost, convenience, taste, and energy improve healthful snack selection in a college foodservice setting. JADA 2001;101:909-13.</p>	<ul style="list-style-type: none"> <li>• Sample: Approximately 2280 university students were potentially exposed to the intervention. 72 students responded to the intercept survey</li> <li>• Design: Intervention study; study included a 13-day baseline, 28-day intervention, and a 13-day follow-up period. Four foods were promoted in separate 1-week interventions: vegetable baskets, pretzels, yogurt, and fruit baskets. Sales of these items along with those for whole fruit, packaged salads, chocolate, candy, and potato chips were monitored to determine if any of the promotions had any effect on their consumption.</li> <li>• Measures: The effects of a point-of-purchase (POP) intervention emphasizing BEST messages (budget-friendly, energizing, sensory/taste, time efficient/convenient), daily sales of the targeted food items during the baseline, intervention and follow-up periods</li> <li>• <b>Conclusion:</b> Statistically significant increase during the intervention and post-intervention periods for yogurt, pretzel and whole fruit sales. Interventions had no effect on fruit basket and vegetable basket sales. BEST properties in POP interventions may be beneficial in promoting the consumption of healthful foods particularly when targeted foods are priced</li> </ul>

	comparably to less healthful foods.
Colby JJ, Elder JP, Peterson G, Knisley PM, Carleton RA. Promoting the selection of healthy food through menu items description in a family-style restaurant. <i>Am J Prev Med</i> 1987;3:171-7.	<ul style="list-style-type: none"> <li>• Sample: Rhode Island City restaurants involved in the Pawtucket Heart Health Program's Four-Heart System Research Program</li> <li>• Design: Intervention study; examined effectiveness of two promotional messages in the sale of three healthful menu items. Each item had a different message: One message emphasized that the specials were particularly healthful, being relatively low in fat, sodium, and cholesterol. A second message stressed flavor and added that the choice was healthful. A third, nonspecific message made no mention of taste or health factors. The item/message combinations were tested on specified days of the week for 9 weeks during lunch.</li> <li>• Measures: Each patron who ordered the daily special was asked to complete two statements at the conclusion of the meal. The first statement was used to determine why the patron ordered the special. The second statement was to determine whether the patron remembered the specific details of the promotional message.</li> <li>• <b>Conclusion:</b> Results indicated that restaurant patrons selected healthful specials when the message noted that the choice was healthful but emphasized flavor.</li> </ul>
Davis-Chervin D, Rogers T, Clark M. Influencing food selection with point-of-choice nutrition information. <i>J Nutr Educ</i> 1985;17:18-22.	<ul style="list-style-type: none"> <li>• Sample: Two dormitory cafeterias for one academic year.</li> <li>• Design: In the first cafeteria, two education components were posted – nutrition education posters and nutrient display cards. In the second cafeteria, only the nutrient display cards were provided. The nutrient education posters (signs) were an attractive, three-component display positioned at the head of the serving line. Information included selected definitions (e.g., cholesterol and saturated fat), descriptions of disease risk factors related to diet, recommendations for dietary changes, and ways to make dietary changes. Signs were changed every five meals. A permanent fixture was a basic reference on calories, cholesterol, and fat calories. The nutrient display cards were 4"X6" three-color cards that provided information on number of calories, percentage of calories from fat, and mgs of cholesterol in each serving of the targeted item.</li> <li>• Measures: Daily inventories were taken in both cafeterias to determine the total servings of each entrée and ancillary items (primarily milk and condiments), and the number of student patrons at each meal. All entrees and ancillary items were analyzed for nutrient content, targeting total calories, milligrams of cholesterol, and percentage of calories provided by fat.</li> <li>• <b>Conclusion:</b> Food selection behavior was influenced in the first cafeteria, but remained unchanged in the second cafeteria.</li> </ul>
French SA. Pricing Effects on Food Choices." <i>Journal of Nutrition</i> , 2003; 133:841S-843S.	<ul style="list-style-type: none"> <li>• Sample: 3 Studies: 1) 12 worksites and 12 secondary schools in MN, 2) 2 secondary school cafeterias, 3) 1 high school</li> <li>• Design: Systematic Review: 1) Lowered price of certain low-fat snacks in vending machine by 10, 25, and 50%. 2) Decreased price 50% of baby carrots and fresh fruits 3) For one year, increased price of popular high fat/sugar foods (3 foods, 10% increase) to subsidize decrease in price of healthy foods (4 foods, decreased by 25%)</li> <li>• Measures: 1) Sales of vending machine items 2) Sale of fresh fruit and baby carrots 3) Sales of specific food items, total revenue</li> <li>• <b>Conclusion:</b> 1) Price decreases of healthier foods led to sales increase of 9, 39, and 93% for decrease of 10, 25, and 50% respectively. No change in overall profits. 2) Sales of fruits increased 4-fold, baby carrots increased 2-fold during the intervention. Sales returned to normal once foods were returned to normal price. 3) Total revenue of the food program was within 5% of estimate based on usual pricing scheme.</li> </ul>
French SA, Jeffery RW, Story, M, et al. Pricing and promotion effects on low-fat vending snack purchases: the CHIPS study. <i>Am J Public</i>	<ul style="list-style-type: none"> <li>• Sample: 10 low-fat snack options in 55 vending machines at 12 schools and 12 worksites in the Minneapolis-St. Paul area.</li> <li>• Design: Randomized trial in which various sites are assigned a randomized sequence of treatment conditions.</li> <li>• Measures: (1) the proportion of low-fat snack items, (2) absolute number of low-fat snack items, and (3) net profits for 4 levels of pricing (equal price, 10% reduction, 25% reduction, and 50% reduction) and 3 levels of promotion (no signs, signs labeling low-fat snacks, and signs labeling low-fat snacks combined with signs placed on vending machines encouraging a low-fat</li> </ul>

Health 2001;91:112-7.	<p>snack choice).</p> <ul style="list-style-type: none"> <li>• <b>Conclusion:</b> Reducing relative prices on low-fat snacks was effective in promoting lower-fat snack purchases from vending machines in both adult and adolescent populations.</li> </ul>
Glanz K, Hewitt AM, Rudd J. Consumer behavior and nutrition education: an integrative review. J Nutr Educ 1992;24:267-77.	<ul style="list-style-type: none"> <li>• Sample: Dependent on individual study.</li> <li>• Design: Review article based on a database of 278 citations on a variety of consumer behavior-nutrition education topics developed over 4 years.</li> <li>• Measures: Surveys, observation, studies of consumer reactions to innovative programs, controlled evaluations of the impact of point-of-purchase (P-O-P) interventions on food purchase behavior and tally of sales.</li> <li>• <b>Conclusion:</b> All studies in cafeterias or restaurants showed some positive behavioral impact on increasing selection of more nutritious foods – effects varied in magnitude and consistency. P-O-P interventions in supermarkets were more successful in improving nutrition knowledge than in changing purchasing behavior. Community-based programs to promote consumption of heart-healthy foods in restaurants provided nutrition information on menus and ordering tips on table tents. Exit interviews showed increases in choice of heart-healthy lunch items and ordering sauces on the side. “Shop Smart for Your Heart” grocery program from the Minnesota Heart Health Program used shelf-labeling of low-sodium and low-fat items. After four months, surveys in two separate communities showed 42% and 62% were aware of the program and 41% and 27% reported the signs influenced their food choices. Levy et al. monitored sales of nutrition information booklets in 25 mid-Atlantic supermarkets for 72 weeks – greatest demand was during first 12 weeks and those following a special diet were more likely to read the guide. Heart decals on menus to indicate recommended items showed an increase in sales in 52 of the 58 recommended items. Albright, Flora, and Fortmann recorded sales from 4 family-style restaurants participating in a menu-labeling program and found significant increases in sales of targeted foods (low-fat, low cholesterol) in 2 of the 4 restaurants. However, patron awareness and comprehension of the labels did not differ significantly between restaurants with sales changes and those with no sales changes. Research shows many consumers want credible information about nutrition, but tend to use it only if it is easily available, clear, perceived as useful and new, and simple to use. Providing info about food products does not ensure its use. For most consumers, nutrition is only one of several factors influencing food selection. People who are better educated, younger, female, and on medically restricted diets usually make nutrition a higher priority. Point of choice nutrition interventions can be effective particularly when they are highly visible and have targeted messages. Product information enhances consumer confidence in products and vendors and improves the image of the information source. Pre-testing of materials for appeal and understandability is essential. It is essential to promote and draw attention to programs through highly visible communications.</li> </ul>
Glanz K, Hoelscher D. Increasing fruit and vegetable intake by changing environments, policy, and pricing: restaurant-based research, strategies, and recommendations. Preventive Medicine 2004;39:88-93.	<ul style="list-style-type: none"> <li>• Sample: N/A</li> <li>• Design: Literature Review: Review included full-service restaurants, fast-food restaurants, food courts, cafeterias (worksites, hospitals, schools), lunch wagons or “trucks,” deli counters, take-out food sources (including vending machines), bars, coffee shops, and food service businesses and catering services</li> <li>• Measures and <b>Conclusion:</b> Six strategies: <ol style="list-style-type: none"> <li>1) Increasing availability of (offer more) healthy options <ul style="list-style-type: none"> <li>○ One study found that increasing the # of reduced-fat menu items increased healthy choices</li> </ul> </li> <li>2) Increasing access to (making more apparent or easier to order) healthy options <ul style="list-style-type: none"> <li>○ No conclusive evidence</li> </ul> </li> <li>3) Reducing prices and use of coupons <ul style="list-style-type: none"> <li>○ No conclusive evidence in non-worksite or school settings</li> </ul> </li> </ol> </li> </ul>

	<ul style="list-style-type: none"> <li>4) Modifying catering policies <ul style="list-style-type: none"> <li>o No conclusive evidence in non-worksite setting</li> </ul> </li> <li>5) Point-of-purchase information <ul style="list-style-type: none"> <li>o Many studies showed sales of targeted items were achieved</li> <li>o See other review on point-of-purchase</li> </ul> </li> <li>6) Promotion and communication: Not evaluated separately – part of multi-component projects.</li> </ul>
<p>Jeffery RW, French SA, Raether C, Baxter JE. An environmental intervention to increase fruit and salad purchases in a cafeteria. <i>Prev Med</i> 1994;23:788-92.</p>	<ul style="list-style-type: none"> <li>• Sample: Cafeteria at a university office building with approximately 700 employees.</li> <li>• Design: Three weeks of baseline observation, three weeks of intervention, and three weeks of return to baseline conditions. Intervention consisted of two changes; increasing selection of fruits and vegetables – six fruit choices instead of three, including three additional vegetables to the salad bar, and reducing price of fruit and salad bar by 50%, from 50 to 25 cents per piece of fruit and from 4 to 2 dollars per pound for salad. Intervention was advertised by posting signs in cafeteria and flyers in employee mailboxes.</li> <li>• Measures: The outcome was measured by daily sales of fruit and salad as assessed by cash register receipts. Questionnaire was distributed to cafeteria customers on 1 day to obtain demographics and whether individuals were currently modifying their diet to control cholesterol, salt, and/or weight.</li> <li>• <b>Conclusion:</b> Fruit and salad purchases were increased threefold during the intervention period compared to the baseline period. Women and those interested in maintaining their weight were the most frequent contributors to this increase. After intervention period, fruit and salad purchases dropped significantly, but did remain slightly higher than the baseline. Fruit purchases during follow-up did not change from baseline, but salad purchases were significantly greater than baseline (<math>p&lt;0.01</math>).</li> </ul>
<p>Kral TVE, Roe LS, Rolls BJ. Does nutrition information about the energy density of meals affect food intake in normal-weight women? <i>Appetite</i> 2002;39:137-45.</p>	<ul style="list-style-type: none"> <li>• Sample: N=40 healthy, normal-weight women</li> <li>• Design: controlled experiment, control group and 1 group given nutrition information</li> <li>• Measures: Nutrition knowledge of energy density and the affect of this knowledge on food intake. Visual analogue scales rating hunger, prospective consumption and satiety and a series of palatability ratings</li> <li>• <b>Conclusion:</b> Subjects in both groups had the same pattern of food intake across the three levels of energy density. Energy density significantly affected energy intake even when individuals are informed about the energy density of meals.</li> </ul>
<p>Regan C. Promoting nutrition in commercial foodservice establishments: a realistic approach. <i>JADA</i> 1987;486-8.</p>	<ul style="list-style-type: none"> <li>• Sample: N/A</li> <li>• Design: Review and editorial</li> <li>• Measures: Compiled statistics about American eating habits in foodservice establishments.</li> <li>• <b>Conclusion:</b> Americans are eating out an average of 3.7 times per week. Restaurant patrons are now more likely to order lower sodium meals, small-size portions, and lower calorie options, but many chefs and owners do not have a sufficient nutrition background to take advantage of this trend. Dietitians would greatly benefit these restaurants by identifying items that should be promoted, recipe enhancement, and training wait staff.</li> </ul>
<p>Seymour J, Yaroch AL, Serdula M, Blanck HM, Khan LK. Impact of nutritional environment intervention on point-of-purchase behavior in adults: a review. <i>Preventive Medicine</i> 2004;39:100-39.</p>	<ul style="list-style-type: none"> <li>• Sample: N/A</li> <li>• Design, Measures, and <b>Conclusions:</b> Literature Review included the following restaurant-based interventions: <ul style="list-style-type: none"> <li>o Albright et al. (1990)</li> <li>o Sample: N = 4 intervention sites (N = 526 surveys)</li> <li>o Design: 4-week baseline and 4-week intervention</li> <li>o Intervention: Menu labeling of low-fat/low-cholesterol entrees in sit down restaurant</li> <li>o Results: Two of the four restaurants had significant increase in proportion of all labeled menu entrees sold</li> </ul> </li> </ul>

- Dubbert PM, Johnson WG, Schlundt DG, Montague NW. The influence of caloric information on cafeteria food choices. *J Appl Behav Anal* 1984;17:85-92.
- Sample: N = 1 restaurant, N = 6970 cash register receipts, and N = 50 subjects observed and interviewed
- Design: 3-week baseline, 9-week intervention, 3-week follow-up
- Intervention: Poster prompts and labeling of low-calorie items in cafeteria
- Results: Increase in sale of low-calorie vegetables and salads
  
- Eldridge et al. (1997)
- Sample: N = 7 intervention restaurants
- Design: 4-month baseline and 9-month intervention
- Intervention: Label existing low-fat menu options in Target cafeteria
- Results: Increase in sale of low-fat menu items
  
- Horgen KB, Brownell KD. Comparison of price change and health message interventions on cafeteria food choices. *Health Psychol* 2002;21:505-12.
- Sample: N = 1 intervention restaurant
- Design: 3-week baseline, 3-week price decrease, 2-week baseline, 8-day health intervention, 2-week combination, and 24-day follow-up
- Intervention: 1) price decrease 2) healthy message 3) combination-price decrease and healthy message
- Results: Strongest increase in sale of target items with combination of price decrease and healthy message
  
- Mayer JA, Heins JM, Vogel JM, Morrison DC, Lankester LD, Jacobs AL. Promoting low-fat entrée choices in a public cafeteria. *J Appl Behav Anal* 1986;19:397-402.
- Sample: N = 1 restaurant, N = 3264 observed meals
- Design: 9-week study
- Intervention: Increase sales of low-fat items by advertising w/ poster, menus, and fliers informing customers of low-fat options
- Results: Increase in sale of low-fat items
  
- Wagner JL, Winett RA. Prompting one low-fat, high-fiber selection in a fast food restaurant. *J Appl Behav Anal* 1988;21:179-85.
- Sample: N = 1 intervention restaurant and N = 1 control restaurant
- Design: 8-week study
- Intervention: Repeat of Mayer et al. in order to increase sale of salads
- Results: Increase in total salad sales for intervention restaurant
  
- Anderson and Has (1990)
- Sample: N = 9 restaurants (reported)
- Design: 2-week baseline, 4-week intervention
- Intervention: Labeling of dishes as heart healthy at sit-down restaurants, cafeterias, and fast food restaurants

<p>Shannon C, Story M, Fulkerson JA, French SA. Factors in the school cafeteria influencing food choices by high school students. <i>Journal of School Health</i> 2002;72:229-34.</p>	<ul style="list-style-type: none"> <li>○ Results: Increase in the sale of 52 of the 58 entrees labeled as heart healthy.</li> <li>● Sample: N=289 students grades 10-12</li> <li>● Design: cross-sectional survey</li> <li>● Measures: Examine the perceived influence of health concerns, labeling and nutrition information, taste, cost, availability, and peers on adolescents' food choices. Determine if these factors vary by gender, grade level, or adolescents' health and weight concerns</li> <li>● <b>Conclusion:</b> Taste and getting a lot for money were important to most students. Females and students who thought about their health and weight more frequently were more likely to report greater interest in labeling and nutrition information and availability of low-fat foods in the cafeteria. Efforts to promote low-fat foods to adolescents need to address the taste of low-fat foods, availability of low-fat options and point-of-purchase (POP) labeling of low-fat foods. Focusing on value and cost of low-fat foods may help promote these foods to males.</li> </ul>
<p>Stubenitsky K, Aaron JI, Catt SL, Mela DJ. The influence of recipe modification and nutritional information on restaurant food acceptance and macronutrient intakes. <i>Public Health Nutr</i> 2000;3:201-9.</p>	<ul style="list-style-type: none"> <li>● Sample: 279 members of local community eating in restaurant</li> <li>● Design: randomized trial, subjects randomly placed into one of four treatment groups: A full-fat blind (FFB) control group given no nutritional information in the menu and was served the Full Fat version. Three groups were all served the modified Reduced Fat version: (i) reduced-fat blind (RFB), who were given no nutritional information; (ii) reduced-fat informed (RFI), who were given nutritional information; (iii) reduced-fat informed with details (RFID), who were given the same nutritional information plus recipe modification details.</li> <li>● Measures: subjects rated their expected and actual liking, the pleasantness of taste, texture and appearance of the dish, how well the dish matched their expectations, and the likelihood of purchase again</li> <li>● <b>Conclusion:</b> The presence of nutritional information on the menu did not significantly increase intakes of energy and fat from the rest of the meal, and did not significantly influence sensory expectations or post-meal acceptance measures (which also did not differ between the FF and RF versions). Consumer characteristics relating to fat reduction attitudes and behaviors were significantly related to the selection of different dishes.</li> </ul>
<p><b>Consumer Support for Placing Nutrition Information/Signals on Menus:</b> The following research highlights consumer attitudes and level of demand for providing various types of nutrition information in the restaurant setting.</p>	
<p>CITATION</p>	<p><i>DESCRIPTION</i></p>
<p>Burton S, Creyer E, Kees J, Huggins K. Attacking the Obesity Epidemic: The Potential Health Benefit of Providing Nutrition Information in Restaurants. <i>American Journal of Public Health</i>, 2006; 96:9:1669-1675.</p>	<p><b>Study 1</b>  Sample: N = 193  Study Design: Cross-sectional analysis with a convenience sample; data were analyzed using analysis of variance techniques  Measures: serving size and actual calorie and nutrient level for each of the 9 restaurant manuals  <b>Conclusion:</b></p> <ul style="list-style-type: none"> <li>● Participants underestimated the calorie levels of less healthful items</li> <li>● Consumers' expectations of nutrient levels were less consistent with the objective levels for less-healthful items than for more healthful items</li> </ul> <p><b>Study 2</b>  Sample: N = 241  Study Design: Experimental; data were analyzed using analysis of variance techniques</p>

	<p>Measures: Overall attitude toward the product and purchase intention; consumers' risk perceptions</p> <p>Conclusion/results:</p> <ul style="list-style-type: none"> <li>• The addition of calorie and nutrient information for dinner house items influenced attitudes, intentions, and choices</li> <li>• Purchase intention and choice decreased for less-healthy items that were worse than expected</li> <li>• Title: Lake, Snell, Perry and Associates and the Harvard Forums on Health. Obesity as a Public Health Issue, 2003. Available at: <a href="http://www.phsi.harvard.edu/health_reform/poll_results.pdf">www.phsi.harvard.edu/health_reform/poll_results.pdf</a>. Accessed June 15, 2006.</li> <li>• Sample: 1002 American adults</li> <li>• Design: national survey</li> <li>• Measures: demographics, response to questions about obesity</li> <li>• <b>Conclusion:</b> 79% consider obesity (and 74% childhood obesity) to be a major health problem, vs. smoking (76%), cancer (95%), heart disease (92%) and HIV/AIDS (87%). Most know obesity increases risk of HD, HTN, diabetes, only half know it can increase risk of some cancers. Half and half split whether obesity is an individual issue or a public health issue. Feel healthcare providers (74%) and schools (48%) should play the major role in fighting the problem. 81% support creation of public recreation areas where they can exercise. 77% support government-funded education campaigns about healthy eating and exercise. 41% support a junk-food tax, 23% strongly. 62% would like restaurants to put nutrition info on menus. Strongly support healthier school lunches, health classes about obesity and exercise importance, parent education, and more PE in schools. Half support prohibiting unhealthy vending sales in schools and limiting TV ads aimed at kids. 76% would support the previous two measures with increased taxes, 42% would pay \$100 more annually in taxes.</li> </ul>
<p>Lightspeed Research. Advertising Age: Exclusive Survey, 2005. Advertising Age March 21, 2005 (also per conversation with Tara Jethwani, Lightspeed Research, Sept 2007)</p>	<ul style="list-style-type: none"> <li>• Sample: 300 adults (ages 18 and over) who participate on Lightspeed Consumer Panel. The sample was selected to closely match current US Census with regard to gender, age, region, income, and ethnicity</li> <li>• Design: Online survey</li> <li>• Measures: demographics and responses to questions regarding food industry and the obesity epidemic</li> <li>• <b>Conclusion:</b> 72% of respondents favored putting calorie information on menu boards at fast food restaurants. When asked to pick one activity companies could do to reduce obesity, 32% of respondents selected "putting calorie counts on menus." 73% indicated that fast-food restaurants have an obligation to provide healthy alternatives on their menus.</li> </ul>
<p>Malone C, Bland-Campbell J. New Insights on the Away-From-Home Eating Patterns and Nutritional Preferences of Americans. Presented at the North American Association for the Study of Obesity Annual Scientific Meeting: Aramark; 2005. Available at: <a href="http://www.aramark.com/CaseStudyWhitePaperDetail.aspx?PostingID=420&amp;ChannelID=221">http://www.aramark.com/CaseStudyWhitePaperDetail.aspx?PostingID=420&amp;ChannelID=221</a>. Accessed June 15, 2006.</p>	<ul style="list-style-type: none"> <li>• Sample: 5,279 adults</li> <li>• Design: Online Interview</li> <li>• Measures: demographics, analysis of answers to questions</li> <li>• <b>Conclusion:</b> Breakfast purchased away from home increased 19.5% in 2004. Americans eat away from home an average of 5.6x/wk. Consumers feel responsible for making sensible food choices. 41% of consumers want to see nutrition info on menus. Fewer adults saying they are strongly attempting to watch weight or limit fat- 29% vs. 33%. 21% of adults strongly attempting to limit trans fat intake. Less Americans trying to limit carbohydrate intake (18% vs. 23% in 2004). 52% report twice weekly exercise, vs. 48% in 2004. Stronger satisfaction with healthy menu options in casual restaurants (34 vs. 22%). Time and convenience are top motivations for meal choices away from home.</li> </ul>

<p>U.S. FDA: Center for Food Safety and Applied Nutrition. Calories Count: Report of the Working Group on Obesity, Maryland;2004.</p>	<ul style="list-style-type: none"> <li>• Sample: Report/review of focus group data from the Working Group on Obesity of the FDA</li> <li>• Design: Focus groups</li> <li>• Measures: Response to answers on numerous questions</li> <li>• <b>Conclusion:</b> <u>Recommendations:</u> Make calories on food label more prominent. Label as a single-serving food packages where the entire contents can reasonably be consumed in a single eating-occasion. Increase enforcement against weight loss products with false or misleading claims. <u>Results from focus groups/study review:</u> Messages directed at reading nutrition labels should focus on small, incremental steps vs. major life changes. Consumers distinguish between overweight and obesity, but those who consider themselves “overweight” have less incentive to action. Adults and teenagers misperceive their weight status: healthy or underweight women perceive themselves overweight, lower income and education underestimate weight status, higher income and education overestimate weight status. Parents of overweight children perceive them as healthy wt or believe the child will outgrow the wt problem. Parents underestimate the frequency of food consumption outside of regular meal times. Children perceived the word “healthy” negatively, associated with eating fruit and vegetables they don’t like. Overweight 11-12 year olds tried to lose weight by skipping meals rather than eating healthier. Children knew importance of eating healthy from parents and nutrition education but info was not useful. Food label use is positively correlated with measurable increases in Healthy Eating Index. Most adults were interested in having nutrition info available when eating at fast-food or quickservice restaurants. Most adults favored idea of placing healthier options in a separate menu section.</li> </ul>
<p>Edmonds J, Baranowski T, Baranowski J, Cullen K, Myres D. Ecological and Socioeconomic Correlates of Fruit, Juice, and Vegetable Consumption among African-American Boys Preventive Medicine 32 2001;32: 476-481.</p>	<ul style="list-style-type: none"> <li>• Sample: N = 90 scouts ages 11-14 and N = 11 census tracts</li> <li>• Design: Cross-sectional</li> <li>• Measures: Two 24-hr food recalls, instruments to measure the availability of fruit, juice and vegetables (100% juice) at area grocery stores, restaurants, and homes</li> <li>• <b>Conclusions:</b> Median income is correlated with restaurant fruit availability. Correlation between restaurant juice and vegetable availability and reported juice and vegetable consumption.</li> </ul>
<p><b>Other Relevant Intervention Strategies (including portions, size of serving dishes, first course offerings, and variety and eating more ):</b> The following research highlights recent research that has not yet been tested in the restaurant setting. These strategies alter some aspect of the nutrition environment or content of the meal to affect the portion sizes chosen and consumed, satiety and hunger ratings, total caloric intake at a single meal and throughout the day. While these findings have not been replicated in restaurants to date, these findings will likely be applicable in the away from home environment.</p>	
<p><b>Portions and Size of Serving Dishes</b></p>	
<p>CITATION</p>	<p>DESCRIPTION</p>
<p>Fisher JO. Effects of age on children’s intake of large and self-selected food portions. Obesity 2007; 15:403-412.</p>	<ul style="list-style-type: none"> <li>• Sample: 75 non-Hispanic white children 2-9 years of age.</li> <li>• Design: Between-subjects design with a within subjects component (Each child in each of three age groups was seen in three conditions in which entrée size was manipulated: reference condition (age-appropriate portion), large condition (doubled entrée), and self-selected condition (portion determined by child).</li> <li>• Measures: Weighed food intake, entrée bite size, bite frequency, height and weight</li> <li>• <b>Conclusion:</b> The age of the children did not significantly affect their intake of the large portion (doubled entrée). However, entrée consumption was 29% greater (p&lt;0.001) and energy intake was 13% greater (p&lt;0.01) in the large portion condition compared to the reference condition (age-appropriate). Increased entrée consumption paralleled larger bite sizes (p&lt;0.001). When the children were allowed to serve themselves, the self-selection showed decreased entrée consumption (p&lt;0.05) and decreased energy intake (p&lt;0.01)</li> </ul>

	<p>only among the children who ate more when served the large portion. Neither the child's weight nor the mother's weight forecasted the entrée consumption in the large portion condition.</p>
<p>Stroebele N, De Castr JM. Effect of ambience on food intake and food choice. Nutrition 2004; 20: 821-38.</p>	<ul style="list-style-type: none"> <li>• Sample: numerous studies and lit reviews of all types</li> <li>• Design: Review</li> <li>• Measures: Ambiance-people present, food accessibility, eating location, color, temperature, lighting, food temp, smell, time, sounds, impact on food intake, preference, selection</li> <li>• <b>Conclusion:</b> People eat and drink more in a group especially when with familiar people as opposed to with strangers. More people present=more food consumed-7 people ate 76% more. Children adopt eating habits of family, adolescents adopt habits of peers. More meat was consumed when the father/husband was present. Overweight people secreted more insulin when seeing a steak being grilled. Drink more water when it is on the table vs. farther away. Portion size influences intake, 30% increased intake with larger portion. Fruit and vegetable intake of adolescents influenced strongly by accessibility at home. Eat more from large containers, popcorn in smaller container perceived healthier. Restaurant food consumers had larger daily intake of energy and fat. Eating occasion and location influence food choice. College dining room with posters about healthy eating and exercise equipment led to students eating more F&amp;V and less meat. Price reduction in healthy snacks increases intake. Food variety and color lead to increased consumption. Hot food suppresses appetite and decreases intake. Cool environment temperature increases intake. Intake of meals adjusted based on time since previous meal. Eating a large portion of intake early in day led to lower overall intake. Music/noise increases intake. TV viewing in children increases between meal snacking. Higher % body fat in children with more time spent in front of TV.</li> </ul>
<p>Wansink B. Environmental factors that increase the food intake and consumption volume of unknowing consumers. Annual Review of Nutrition 2004; 24:455-79.</p>	<ul style="list-style-type: none"> <li>• Sample: Various food consumption studies showing how environment impacts food intake.</li> <li>• Design: Review</li> <li>• Measures: Package size, plate shape and size, lighting, socializing, music, distractions such as watching TV or movie, effort required to obtain food, food variety, stockpiles, and serving containers.</li> <li>• <b>Conclusion:</b> Environment can be organized into eating environment (ambient factors associated with eating) and food environment (ways food is provided or presented). Environments contribute to consumption volume by suggesting consumption norms and inhibiting consumption monitoring. Package size, variety, plate size suggest consumption norms. Eating environment stimulates consumption via presence of food, social aspects of food, and having something to do while reading or watching TV. Atmospheric affect food consumption, such as temperature, lighting, odor, and noise – the perceived level of comfort can increase or decrease food intake. The effort required to obtain food often dictates how much people will consume and their level of preference for that food. Socializing during the meal can affect food intake by extending meal times or by observing other's eating behaviors that may suggest a different consumption norm. Distractions such as TV, movies, reading, can initiate or and/or extend consumption often due to behaviorally ingrained eating scripts or patterns. Stockpiled food, such as bulk items or multi-unit packages from wholesale stores, may be eaten at a faster rate than non-stockpiled foods due to greater visibility and saliency. Serving containers that are wide or large can create consumption illusions and may contribute to over-consumption.</li> </ul>
<p>Wansink B, Painter, J, North J. Bottomless bowls: why visual cues of portion size may influence intake. Obesity Research</p>	<ul style="list-style-type: none"> <li>• Sample: 54 participants (BMI 17.3-36, ages 18-46)</li> <li>• Design: Between-subject design with two visibility levels: 1) accurate visual cue of food portion (normal bowl) vs. 2) biased visual cue (self-refilling bowl)</li> <li>• Measures: Intake volume, intake estimation, consumption monitoring and satiety</li> <li>• <b>Conclusion:</b> Participants unknowingly eating from self-refilling bowls ate 73% more soup than those eating from normal bowls, but they did not believe they consumed more and did not perceive themselves as more sated. This was unaffected by BMI.</li> </ul>

<p>2005;13:93-100.</p> <p>Wansink B, van Ittersum K. Shape of glass and amount of alcohol poured: comparative study of effect of practice and concentration. <i>BMJ</i> 2005; 331:1512-4.</p>	<ul style="list-style-type: none"> <li>• Sample: 198 college students and 86 bartenders</li> <li>• Design: 2X2 between subject design manipulated glass shape (short and wide v tall and slender) and amount attention allocated to pouring task (low v high)</li> <li>• Measures: Volume of alcohol poured into short, wide and tall, slender glasses</li> <li>• <b>Conclusion:</b> Aiming to pour a shot of alcohol (1.5 ounces), both students and bartenders poured more alcohol into short, wide glasses than into tall slender glasses. Practiced reduced the tendency to overpour, but not for short, wide glasses. Despite an average of six years of experience, bartenders poured 20.5% more into short, wide glasses than tall, slender ones; paying careful attention reduced but did not eliminate the effect.</li> </ul>
<p>Wansink B, van Ittersum K, Painter JE. Ice cream illusions: bowls, spoons, and self-served portion sizes. <i>American Journal of Preventive Medicine</i> 2006; 31: 240-43.</p>	<ul style="list-style-type: none"> <li>• Sample: 85 nutrition experts at an ice cream social</li> <li>• Design: 2x2 between-subjects randomized design</li> <li>• Measures: Participants were randomly given a 17oz or 34oz ice cream bowl and either a 2oz or 3oz serving spoon creating four groupings: 1) Small bowl, small spoon, 2) Small bowl, big spoon, 3) Big bowl, small spoon, 4) Big bowl and big spoon. After each individually served and purchased their ice cream, each filled out a survey asking the following: 1) How much they thought they took in ounces and calories, 2) How many spoonfuls they took, 3) What percentage of their bowl was full, and 4) How did this amount compare to what they normally eat. Additionally, while filling out surveys, their bowls were weighed</li> <li>• <b>Conclusion:</b> Those with the bigger bowls took 31% more ice cream than those with smaller bowls, even though surveys revealed the "larger" group did not perceive they had taken more. Those in the big bowl, big spoon group took 56.8% more than those with small bowls and small spoons. The authors conclude that people are unaware of how much food they are taking and size of dish and/or serving utensil could help control how much is consumed.</li> </ul>
<b>First Course Offerings:</b>	
CITATION	DESCRIPTION
<p>Fisher JO, Rolls BJ, Birch LL. Children's bite size and intake of an entrée are greater with large portions than with age-appropriate or self-selected portions. <i>Am J Clin Nutr</i> 2003;77:1164-70.</p>	<ul style="list-style-type: none"> <li>• Sample: 30 pre-school-aged children</li> <li>• Design: Within-subject crossover</li> <li>• Measures: Bite size and energy intake at lunch. For 12 weeks, subjects received 4 weeks of reference or large portion, 2 weeks of self served portions, 4 weeks of reference or large portion (depending on what they did not get the first 4 weeks), and 2 weeks of self served portions. A large portion was double the size of a reference portion.</li> <li>• <b>Conclusion:</b> Repeated exposure to large portion sizes increases children's bite size and energy intake.</li> </ul>
<p>Rolls BJ, Bell EA, Thorwart ML. Water incorporated into a food but not served with a food decreases energy intake in lean women. <i>Am J Clin</i></p>	<ul style="list-style-type: none"> <li>• Sample: 24 women aged 20-37 years</li> <li>• Design: Within-subjects design</li> <li>• Measures: Energy intake. Over four weeks subjects ate three meals for one day each week. One week was control, while the other three consisted of varying isoenergetic "preloads" which were either chicken rice casserole, chicken rice casserole served with a glass of water, or chicken rice soup prior to lunch.</li> <li>• <b>Conclusion:</b> Consuming foods with high water content increased satiety and reduced subsequent energy intake than did simply drinking water with the food.</li> </ul>

<p>Nutr 1999; 70: 55.</p> <p>Rolls BJ, Roe LS, Meengs, JS. Salad and satiety: energy density and portion size of a first-course salad affect energy intake at lunch. Journal of the American Dietetic Association 2004; 104: 1570-6.</p>	<ul style="list-style-type: none"> <li>• Sample: 42 women</li> <li>• Design: Randomized-crossover trial</li> <li>• Measures: Energy intake, rating of hunger, rating of satiety, and rating of food characteristics. Once per week for 7 weeks lunch was eaten in a lab. Each week participants were given a different salad varying in portion size and energy density as determined by amount of cheese and dressing used and instructed to finish the salad. They were then given a pasta entrée and told to eat as much as they wanted.</li> <li>• <b>Conclusion:</b> Eating a large portion of a low-energy dense food for a first course increases satiety and reduces overall meal energy intake.</li> </ul>
<p>Wansink B, Painter JE, Lee Y-K. The office candy dish: proximity's influence on estimated and actual consumption. International Journal of Obesity 2006; 30: 871-875.</p>	<ul style="list-style-type: none"> <li>• Sample: 40 secretaries</li> <li>• Design: 2x2 within-subject design</li> <li>• Measures: Amount of chocolate consumed based on 1) visibility and 2) proximity and consumer perception of amount consumed.</li> <li>• <b>Conclusion:</b> If chocolates were proximate (on desk) there were significantly more eaten regardless of whether or not they were visible and if chocolates were less-proximate (2m away from desk) and visible there were significantly more eaten than baseline (less-proximate and less-visible). In addition, subjects consistently under-reported the number of chocolates eaten when the dish was proximate and over-reported the number with the dish was less-proximate. The authors therefore conclude that proximity and visibility can significantly alter amount of food consumed and that individuals may be biased in estimating consumption of food based on proximity.</li> </ul>
<p><b><i>Variety and Eating More:</i></b></p>	
<p>CITATION</p>	<p>DESCRIPTION</p>
<p>Berry SL, Beatty WW, Klesges RC. Sensory and social influences on ice cream consumption by males and females in a laboratory setting. Appetite 1985;6:41-5.</p>	<ul style="list-style-type: none"> <li>• Sample: N=126; 61 male and 65 female undergraduate students</li> <li>• Design: Cross sectional study</li> <li>• Measures: Amount of ice cream eaten in social groups vs. alone and amount of ice cream eaten when offered flavor variety vs. a single flavor.</li> <li>• <b>Conclusion:</b> Women ate more ice cream when eating in a group and offered more flavors combined, whereas men ate more when eating in a group or when offered more flavors, but not combined. The authors speculate this is most likely a ceiling effect, although may reflect actual gender differences.</li> </ul>
<p>Kahn BE, Wansink B. The influence of assortment structure on perceived variety and consumption quantities. Journal of Consumer Research 2004;30:519-33.</p>	<ul style="list-style-type: none"> <li>• Sample: 1) children, 2) 123 adults from PTA, 3) children, 4) 105 adults</li> <li>• Design: 2x2 between-subject, varied combination of variety and assortment</li> <li>• Measures: Quantity consumed</li> <li>• <b>Conclusion:</b> Children ate more with more variety when the different foods were organized, but not when disorganized. Adults ate more with an organized variety. Children ate more from a larger, organized tray. Adults consuming foods with high variety and asymmetric assortment perceived the tray as more fun to eat than those with lower variety and symmetrical assortment.</li> </ul>

<b>Evaluation/Assessment Strategies:</b> This section reviews literature on tested measures that can be used to assess healthy options in the away from home eating environment.	
CITATION	DESCRIPTION
Cassady D, Houseman NR, Dagher C. Measuring cues for healthy choices on restaurant menus: development and testing of a measurement instrument. Am J Health Promot 2004;18:444-49.	<ul style="list-style-type: none"> <li>• Sample: Fourteen locally-owned restaurants in a low-income, urban, African-American community in Los Angeles, California. Ten of the restaurants specialized in soul, Caribbean, or Cajun cuisine.</li> <li>• Design: Two trained community reviewers independently coded menus from the 12 restaurants, in order to test the interrater reliability of the measuring instrument.</li> <li>• Measures: A Menu Checklist was adapted from previously tested materials, developed by the Prevention Research Center at Saint Louis University. The Menu Checklist looked for low-fat and healthy labeling, amount of fruits and vegetables offered, whether 100% vegetable oil was used for frying, milk availability, and 100% juice availability. Intraclass coefficients, k statistics, and percent agreements were calculated to assess interrater reliability.</li> <li>• <b>Conclusion:</b> High interrater reliability which suggests the Menu Checklist is a low-cost way to collect data on food choices in restaurants. Restaurant menus had minimal labeling, and low-fat choices were rare. Fruits and vegetables were more plentiful with 31% of all entrees including one serving, and 39% of all appetizers consisting primarily of fruits and vegetables.</li> </ul>
Cheadle AD, Psaty BM, Curry S, et al. Assessing the validity of a survey of the restaurant health promotion environment. Am J Health Promot 1994;9:88-91.	<ul style="list-style-type: none"> <li>• Sample: Random sample of restaurants from Seattle and 12 California communities from the Yellow Pages directory. Fifty-four restaurants were surveyed in Seattle and 329 surveyed in the 12 California communities, with a range of 25 to 38 restaurants per community.</li> <li>• Design: Telephone-administered survey to restaurants in 1990-1991. Within one-month time, the same surveyed restaurants in Seattle only were visited by project staff in order to assess the validity of the information recorded during phone survey.</li> <li>• Measures: Survey recorded the number of entrees explicitly identified as low-fat.</li> <li>• <b>Conclusion:</b> Agreement between survey and direct observation was fairly weak. Seven out of 52 Seattle restaurants indicated on the phone that their restaurant had menu items specifically designated as low-fat, but direct observation revealed only one restaurant had the low-fat menu identification. It is apparent that restaurant personnel may exaggerate the extent of the positive health environment; therefore direct observation is the gold standard of assessment.</li> </ul>
Glanz K, Sallis JF, Saelens BE, Frank LD. Nutrition Environment Measures Survey in Stores (NEMS-S): development and evaluation. Am J Prev Med 2007; 32:282-89.	<ul style="list-style-type: none"> <li>• Sample: 85 stores in four neighborhoods in Atlanta metro area – each neighborhood had a minimum of 15 retail food stores. Neighborhoods were selected to contrast food stores in areas of different income levels and walkability.</li> <li>• Design: Two trained raters separately visited each food store and completed the same assessment within 1 month of each other.</li> <li>• Measures: Ten food categories (e.g., fruit) or indicator food items (e.g., ground beef) were evaluated using a composite food environment quality score. Three dimensions were evaluated including availability, quality, and price. Data was collected and analyzed in 2004 and 2005.</li> <li>• <b>Conclusion:</b> Prices for most healthy (lower fat, lower calorie, and whole grain) options were not significantly different compared to regular items, except for hot dogs, lean ground beef, and baked chips. More healthy options were available in grocery stores compared to convenience stores and in higher income neighborhoods (p&lt;0.01).</li> </ul>
Glanz K, Sallis JF, Saelens BE, Frank LD. "Healthy Nutrition Environments: Concepts and	<ul style="list-style-type: none"> <li>• Sample: N/A</li> <li>• Study Design: Literature Review</li> <li>• Measures: Overview of literature reviewed</li> <li>• <b>Conclusion:</b> Nutrition environment may aid in explaining some of the racial/ethnic and socioeconomic disparities in nutrition and health outcomes. Accessibility and affordability are very large factors in determining what is purchased and consumed. Researchers have</li> </ul>

<p>Measures." American Journal of Health Promotion, 19(5): 330-333.</p>	<p>found correlations of neighborhood characteristics with individual food purchasing or consumption habits. Relative proximity in space of healthy vs. unhealthy food products affects the odds of a healthy vs. an unhealthy diet. Greater priority needs to be given to understanding the role of food environments on individual's eating patterns.</p>
<p>Saelens BE, Glanz K, Sallis JF, Frank LD. Nutrition environment measures study in restaurants (NEMS-R): development and evaluation. Am J Prev Med 2007; 32:273-81.</p>	<ul style="list-style-type: none"> <li>• Sample: 217 sit-down and fast-food restaurants in four neighborhoods selected to provide diversity in community design in Atlanta, Georgia in 2004 and 2005.</li> <li>• Design: Evaluations conducted in all restaurants in 3 out of 4 neighborhoods, all fast-food restaurants, and random sample of sit-down restaurants in remaining neighborhood due to large sample. Inter-rater and test-retest reliability was accomplished with three different assessments of each restaurant.</li> <li>• Measures: Restaurant observation instrument was designed to evaluate the healthfulness of foods and beverages on main menu and children's menu – focused on availability, facilitators, supports for healthy eating, barriers for healthy eating, pricing, and signage/promotion. Items were considered to be unhealthy unless specific information to the contrary was provided, or if the food was inherently healthy, such as raw fruit. Healthy items were defined as <math>\leq 800</math> kcals, <math>\leq 30\%</math> kcals from fat, <math>\leq 10\%</math> kcals from saturated fat for non-burger/sandwich entrees, or a regulated healthy designation of low-fat or light.</li> <li>• <b>Conclusion:</b> Only 21% of sit-down restaurants and 36% of fast-food restaurants had healthy main dishes. Less than 12% of all restaurants listed available fruit. Non-fried vegetables were available in 53% of sit-down restaurants and 27% of fast-food restaurants. Whole grain bread was available in less than 25% of restaurants, and less than 10% offered low-fat or non-fat milk. Fast-food restaurants more often encouraged large portions, unhealthful eating, and overeating, but also provided nutrition information more often than sit-down restaurants. Inter-rater reliability was high with most kappa values greater than 0.80 and percent-agreement values greater than 75%.</li> </ul>