



Searching for Healthy Food

The Food Landscape in California Cities and Counties

POLICY BRIEF NO 5

JANUARY 2007

SUMMARY

California is in the midst of a growing obesity epidemic. There is increasing evidence that what we eat and the likelihood of being obese are influenced by the foods available in neighborhoods—what we call the food landscape or food environment. The California Center for Public Health Advocacy (CCPHA) conducted a study of the food environment in California as revealed by the distribution of retail food outlets—fast-food restaurants, convenience stores, supermarkets and produce vendors—and found that in 2005, the state had more than four times as many fast-food restaurants and convenience stores as supermarkets and produce vendors. There was substantial variability in the ratio of retailers across cities and counties. Steps must be taken to ensure that every California community has a healthy food environment.

THE OBESITY EPIDEMIC AND THE FOOD ENVIRONMENT

California is in the midst of a growing obesity epidemic.¹ Overweight and obesity* are serious health issues, associated with increased risk of morbidity and mortality from chronic diseases, including cardiovascular disease and diabetes.^{2,3} In 2002, the prevalence of obesity in the state was 19.2 percent, twice the prevalence just 12 years earlier.⁴ More than half of all California adults are now obese⁴ or overweight.⁵ Among California 5th, 7th, and 9th graders, 28.1 percent were overweight in 2004.⁶ In 2000 alone, the cost of medical care, workers' compensation, and lost productivity attributable to overweight, obesity, and physical inactivity for California adults was \$21.7 billion.⁷

*Overweight is defined as Body Mass Index (BMI) greater than 25.0 and less than or equal to 29.9 and obesity is defined as BMI greater than or equal to 30.0.

In the simplest sense, obesity is the result of an imbalance between an individual's energy intake and energy expenditure. Looking more deeply at the origins of obesity, however, reveals a complex array of factors that influence the balance between "calories in" and "calories out." Although individual choice is an essential component in selecting a diet appropriate for one's level of physical activity, translating that choice into healthy eating brings a constellation of factors into play. To act on a decision to eat a nutritious diet, the consumer must have information about the nutritive value of a food choice and be able to find and afford it. In other words, the consumer requires a "food environment" in which healthy choices can be readily identified and easily purchased.

THE RETAIL FOOD ENVIRONMENT

There is growing evidence that what we eat—and the likelihood of being obese—are influenced by the food environment.⁸ Recent decades have seen substantial changes in the way Americans live, work, and eat. Since the 1970s, food expenditures have been shifting from food eaten at home to food eaten away from home. Out-of-home food expenditures ballooned from 27.6 percent of a family’s food budget in the early 1970s to 41.9 percent of that budget in 2002–2003.⁹ Similarly, the share of calories from food eaten away from home rose from 18 percent in 1977–1978 to 34 percent in 1995.¹⁰ Children may be the most affected by these shifts: between 1977 and 1996, the amount of food that children consumed from restaurants nearly tripled.^{11, 12}

Fast Food: An Increasing Share of Calories Consumed

Since 1982, fast-food restaurants have claimed an increasing share of the food eaten away from home.¹³ Research has shown that eating at fast-food restaurants is associated with unhealthy eating patterns and negative health consequences. In adults, eating at fast-food restaurants is associated with higher caloric intake,¹⁴ lower vegetable consumption,¹⁵ and higher rates of obesity.¹⁵ For children and adolescents, fast-food consumption is associated with higher caloric intake, greater consumption of sweetened beverages, and lower consumption of fruits and vegetables.¹⁶ On a typical day, 30 percent of American children eat at least one fast-food meal.¹⁷

As fast-food restaurants have proliferated, they have competed for customers by increasing portion size and advertising value in larger servings.^{11, 13, 18-20} Research has demonstrated that when people are served more food, they eat more food.²¹⁻²³ Furthermore, research has demonstrated that people consistently underestimate the caloric content of fast-food meals, particularly when the portion size is very large.²⁴ Not surprisingly, large portion sizes have been implicated in several studies for their role in the obesity epidemic.^{12, 20, 25, 26} It is now not uncommon for a fast-food meal to approach an entire day’s worth of calories.¹⁸

Supermarkets

Supermarkets are defined by the grocery industry as “any full-line self-service grocery store generating a sales

volume of \$2 million or more annually.”²⁷ Supermarkets are a significant source of food for American families, with 73.5 percent of grocery sales attributable to supermarkets in 2000²⁸ and 81 cents of every dollar spent in supermarkets going toward food purchases.²⁹ American supermarket sales reached \$478.9 billion in 2005.²⁷ The industry focuses on providing a wide array of products to consumers, including fresh produce, meats, grain and dairy products, and ready-to-eat foods. Fresh produce plays a significant role in grocery sales. From 1987 to 1997, the number of different items sold in supermarket produce sections nearly doubled, from 173 to 335, on average.³⁰

The availability of supermarkets appears to be associated with dietary behaviors and health status. Research studies have shown that people who live near supermarkets are more likely to eat the recommended amounts of fruits and vegetables³¹ and are less likely to be obese.³² Living near a supermarket is positively associated with a higher-quality diet.³³ Conversely, in Chicago, living in neighborhoods with high numbers of fast-food restaurants compared to grocery stores was associated with premature death due to diabetes, cancer and cardiovascular disease.³⁴

The relationship between supermarkets and dietary behaviors is in part significant because of the changing nature of the grocery industry. The number of supermarkets in the United States peaked in 1985 at 27,765 and has declined by 11 percent since then.³⁵ Much of this decline is due to a wave of grocery store closures and consolidation that began in 1996 in an effort to increase efficiency.³⁶ For example, San Jose and Sacramento both experienced major grocery store closures in 2006. This consolidation in the grocery industry could reasonably be expected to have an impact on the health of people who no longer have access to nearby supermarkets.

Convenience Stores

The National Association of Convenience Stores defines a convenience store as “a retail business with primary emphasis placed on providing the public a convenient location at which to purchase from a wide array of consumable products (predominantly food or food and gasoline services).”³⁷ Products sold include a variety of calorie-dense, nutrient-poor beverages and

snacks. Many convenience stores now include a selection of foods prepared to go. Convenience stores typically are smaller than 5,000 square feet and have extended hours of operation, with many operating 24 hours a day, seven days a week.

Produce Vendors

Retail outlets whose primary function is the sale of produce include produce stores and farmers markets. Nationwide, fruit and vegetable markets make up a very small fraction of food stores, with only 2,917 such stores operating nationally in 1992.³⁵ A certified farmers market is a location approved by a county agricultural commissioner where authorized farmers sell produce they have grown themselves directly to consumers.³⁸ A system of certified farmers markets has been established in California to strengthen the connection between farmers and consumers.

THE STUDY: UNDERSTANDING THE FOOD ENVIRONMENT IN CALIFORNIA

To further understand the California food environment, the California Center for Public Health Advocacy (CCPHA) examined the distribution of retail food outlets in the state. We used April 2005 data from the GIS and mapping software firm of ESRI to identify and locate businesses with industry codes identifying them as fast-food restaurants, convenience stores, supermarkets and produce stores. We supplemented this data set with a listing of California farmers markets. Convenience stores attached to gas stations were not included in our study because data were incomplete for this type of business. Of the retail food businesses included in the study, supermarkets and produce vendors (produce stores and farmers markets) are places where healthy foods such as fruits and vegetables are readily available, while fast-food restaurants and convenience stores are places where such products are less readily available.

We used GIS software to assign each retail food outlet to the appropriate census tract. Total numbers of retail outlets were then summed across census tracts to determine the number of outlets by city and county.

The Retail Food Environment Index (RFEI)

To describe the retail food environment, we developed the Retail Food Environment Index (RFEI). For the state as a whole, and for cities and counties with populations greater than 250,000, we divided the sum of the number of fast-food restaurants and convenience stores by the sum of the number of supermarkets and produce vendors (both produce stores and farmers markets). A high RFEI means that a region has a large number of fast-food restaurants and convenience stores compared to supermarkets and produce vendors.

FINDINGS

The study found a statewide RFEI of 4.18, meaning that in 2005 for California as a whole there were more than four times as many fast-food restaurants and convenience stores as supermarkets and produce vendors. We identified a total of 26,627 retail food outlets in California in 2005: 14,823 fast-food restaurants, 6,659 convenience stores, 3,853 supermarkets,

THE RETAIL FOOD ENVIRONMENT INDEX (RFEI)

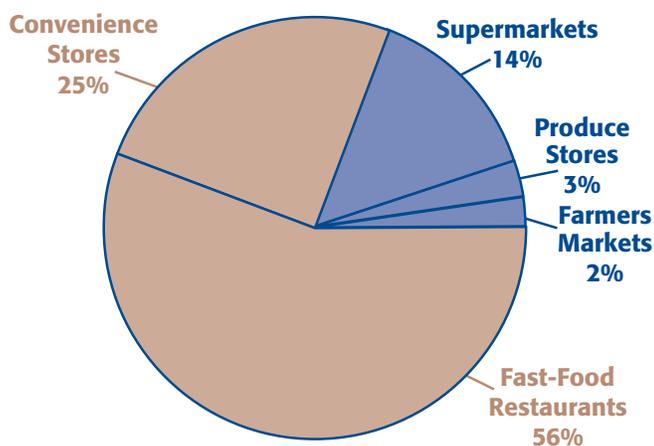
The RFEI is constructed by dividing the total number of fast-food restaurants and convenience stores by the total number of supermarkets and produce vendors (produce stores and farmers markets) in an area (city, county, state).

$$\text{RFEI} = \frac{(\# \text{ Fast-Food Restaurants} + \# \text{ Convenience Stores})}{(\# \text{ Supermarkets} + \# \text{ Produce Stores} + \# \text{ Farmers Markets})}$$

The result is the ratio of retail food outlets in a community that are likely to offer little in the way of fruits, vegetables, and other healthy foods to those in which such products are likely to be more readily available. For example, a community with an RFEI of 2.0 has twice as many fast-food restaurants and convenience stores as it does supermarkets and produce vendors.

847 produce stores and 445 farmers markets. The pie chart shows the proportion of each type of retail food outlet in the state.

Distribution of Retail Food Outlets in California



In California as a whole, there are more than four times as many fast-food restaurants and convenience stores as supermarkets and produce vendors, for a Retail Food Environment Index (RFEI) of 4.18.

The RFEI varied substantially among counties and cities with populations greater than 250,000 (see table at right). Among counties, San Bernardino has the highest ratio at 5.72, meaning that there are nearly six times as many fast-food restaurants and convenience stores as supermarkets and produce vendors in the county. Santa Cruz County has the lowest ratio at 1.84, meaning that, on average, the nearest retail food outlet is still almost twice as likely to be a fast-food restaurant or convenience store as a supermarket or produce vendor. Other counties with more than five times the number of fast-food restaurants and convenience stores as supermarkets and produce vendors are Sacramento (5.66), Fresno (5.34), Orange (5.13), and Solano (5.08).

Among the 13 California cities with populations greater than 250,000, two (Bakersfield and Fresno) have at least six times, and two others (Long Beach and Riverside) have at least five times the number of fast-food restaurants and convenience stores as supermarkets and produce vendors.

Discussion

This study establishes that there are more than four times as many fast-food restaurants and convenience

stores in California as supermarkets and produce vendors. Our finding may in fact underestimate the ratio because our calculation did not include convenience stores associated with gas stations. In addition, we found substantial variations among California communities in the distribution of healthy and unhealthy retail food outlets. Further studies are needed to better understand the factors contributing to the distribution of retail food outlets in California communities. Additional studies are also needed to investigate the consequences to Californians of living in neighborhoods with a less healthy balance of food outlets. Although we have not yet examined whether the retail food environment is associated with adverse health in California, the growing body of evidence that the retail food environment plays an important role in determining health suggests that steps should be taken to assure a healthy food environment in all California communities.

Retail Food Environment Index (RFEI) by County and City* (Sorted by RFEI)

COUNTY	RFEI
SAN BERNARDINO	5.72
SACRAMENTO	5.66
FRESNO	5.34
ORANGE	5.13
SOLANO	5.08
KERN	4.87
STANISLAUS	4.79
CONTRA COSTA	4.66
RIVERSIDE	4.63
ALAMEDA	4.61
LOS ANGELES	4.60
TULARE	4.42
SANTA CLARA	4.32
SAN DIEGO	4.20
SAN JOAQUIN	4.03
VENTURA	3.86
SAN FRANCISCO	3.85
PLACER	3.84
SANTA BARBARA	3.00
SAN MATEO	2.79
SONOMA	2.52
MONTEREY	2.14
SAN LUIS OBISPO	2.01
MARIN	1.85
SANTA CRUZ	1.84

CITY	RFEI
BAKERSFIELD	6.63
FRESNO	6.23
LONG BEACH	5.80
RIVERSIDE	5.58
SACRAMENTO	4.97
ANAHEIM	4.79
STOCKTON	4.73
SAN JOSE	4.62
SAN DIEGO	4.58
SANTA ANA	4.40
LOS ANGELES	4.24
SAN FRANCISCO	3.85
OAKLAND	3.81

*California counties and cities with populations greater than 250,000 as estimated by the California Department of Finance.

The higher the RFEI, the greater the number of fast-food restaurants and convenience stores compared to supermarkets and produce vendors.

CALIFORNIANS NEED HEALTHIER FOOD CHOICES

Every Californian deserves to live in a neighborhood where healthy food is at least as available as unhealthy food. Most Californians today do not live in such neighborhoods. We found more than four times as many fast-food restaurants and convenience stores in California as supermarkets and produce vendors. In many cities and counties, the ratio was even higher. Steps must be taken to shift the relative availability in favor of healthy food choices in our state. Such steps

are outlined in the California Obesity Prevention Plan³⁹ released by the California Department of Health Services in September 2006 and in the Governor's Vision for a Healthy California⁴⁰ released in September 2005. These documents specifically identify access to healthy foods and accurate information about nutritional content of restaurant foods as key strategies for controlling California's obesity epidemic.

ACTIONS NEEDED

The California Center for Public Health Advocacy calls on federal, state and local policy makers to enact policies that promote a healthy food environment for all Californians. Specifically, we call on them to enact policies to accomplish the following:

- 1. Increase the number of grocery stores and other produce vendors in neighborhoods that have limited access to fruits, vegetables, and other healthy foods.** State and local governments should implement policies that stimulate and support retail projects that provide access to healthy foods through strategies such as grants, loans, and zoning regulations.
- 2. Support other innovative retail strategies to increase the availability of fruits, vegetables, and other healthy foods in California neighborhoods.** State and local governments should support nontraditional approaches to expanding access to healthy food—such as mobile vendors, direct farm-to-consumer sales, healthier options at fast-food restaurants, and training and technical assistance for retailers.
- 3. Set reasonable limits on the number of fast-food restaurants and convenience stores in California neighborhoods.** The health implications of these establishments should be considered in the community design and permitting process. State and local governments should seek a balance of retailers that support both the economic *and* health needs of communities.
- 4. Utilize federal nutrition assistance programs, such as Food Stamps and WIC, to make fruits, vegetables, and other healthy foods more affordable to low-income families.** Even with food assistance programs, many families find it difficult to afford healthy food. Increasing families' financial ability to purchase healthy foods will increase the demand for healthy food retailers. State and local governments should enhance assistance programs so that families are better able to purchase healthy foods. For example, the state should fund the fruit and vegetable incentive program established through AB 2384 (Leno, 2006).
- 5. Require food retailers such as fast-food restaurants to provide consumers with nutritional information for all items on menus and menu boards.** Given the proliferation of fast-food restaurants and convenience stores, consumers need immediate access to the nutrient content of items sold by these retailers so that they can make healthier choices. State and local governments should require retailers to post nutrition information on menus and menu boards.

REFERENCES

1. California Department of Health Services. California obesity prevention initiative: the obesity problem. <http://www.dhs.ca.gov/ps/cdic/copi/html/problem.htm>. Accessed November 17, 2006.
2. Visscher TL, Seidell JC. The public health impact of obesity. *Annu Rev Public Health*. 2001;22:355-375.
3. US Department of Health and Human Services. Overweight and obesity: health consequences. http://www.surgeongeneral.gov/topics/obesity/calltoaction/fact_consequences.htm. Accessed November 29, 2006.
4. Centers for Disease Control and Prevention (CDC). Obesity: by body mass index. Trends Data. <http://apps.nccd.cdc.gov/brfss/Trends/trendchart.asp?qkey=10010&state=CA>. Accessed November 16, 2006.
5. Centers for Disease Control and Prevention (CDC). Overweight: by body mass index. Trends Data: California <http://apps.nccd.cdc.gov/brfss/Trends/trendchart.asp?qkey=10080&state=CA>. Accessed November 16, 2006.
6. California Center for Public Health Advocacy. The growing epidemic: childhood overweight rates on the rise in California assembly districts; 2005. http://www.publichealthadvocacy.org/research_pdfs/docs/fullpolicyreport.pdf. Accessed November 30, 2006.
7. Chenoweth D. The economic costs of physical inactivity, obesity, and overweight in California adults: health care, workers' compensation, and lost productivity. California Department of Health Services; April 2005.
8. Sallis JF, Glanz K. The role of built environments in physical activity, eating, and obesity in childhood. *Future Child*. Spring 2006;16(1):89-108.
9. 100 years of U.S. consumer spending: data for the nation, New York City, and Boston. Washington: U.S. Department of Labor Bureau of Labor Statistics; May 2006. Report 991.
10. Lin BH, Guthrie J, Frazão E. Away-from-home foods increasingly important to quality of American diet. USDA, Economic Research Service; January 1999. <http://www.ers.usda.gov/publications/aib749.pdf>. Accessed December 15, 2006.
11. St-Onge MP, Keller KL, Heymsfield SB. Changes in childhood food consumption patterns: a cause for concern in light of increasing body weights. *Am J Clin Nutr*. December 2003;78(6):1068-1073.
12. Nielsen S, Popkin B. Patterns and trends in food portion sizes, 1977-1998. *J. Am. Med. Assoc.* 2003;289:450.
13. Stewart H, Blisard N, Bhuyan S, Nayga RM. The demand for food away from home: full-service or fast food? Washington: U.S. Department of Agriculture, Economic Research Service; January 2004. AER-829.
14. Satia JA, Galanko JA, Siega-Riz AM. Eating at fast-food restaurants is associated with dietary intake, demographic, psychosocial and behavioural factors among African Americans in North Carolina. *Public Health Nutr*. December 2004;7(8):1089-1096.
15. Jeffery RW, Baxter J, McGuire M, Linde J. Are fast food restaurants an environmental risk factor for obesity? *Int J Behav Nutr Phys Act*. 2006;3:2.
16. Taveras EM, Berkey CS, Rifas-Shiman SL, et al. Association of consumption of fried food away from home with body mass index and diet quality in older children and adolescents. *Pediatrics*. October 2005;116(4):518-524.
17. Bowman SA, Gortmaker SL, Ebbeling CB, Pereira MA, Ludwig DS. Effects of fast-food consumption on energy intake and diet quality among children in a national household survey. *Pediatrics*. January 2004;113(1 Pt 1):112-118.
18. Anyone's guess: the need for nutrition labeling at fast-food and other chain restaurants. *Center for Science in the Public Interest*; November 2003.
19. Young LR, Nestle M. Expanding portion sizes in the US marketplace: Implications for nutrition counseling. *J Am Diet Assoc*. February 2003;103(2):231-234.
20. Matthiessen J, Fagt S, Biloft-Jensen A, Beck AM, Ovesen L. Size makes a difference. *Public Health Nutr*. February 2003;6(1):65-72.
21. Wansink B. Environmental factors that increase the food intake and consumption volume of unknowing consumers. *Annu Rev Nutr*. 2004;24:455-479.
22. Wansink B, Kim J. Bad popcorn in big buckets: portion size can influence intake as much as taste. *J Nutr Educ Behav*. September-October 2005;37(5):242-245.
23. Wansink B, Painter JE, North J. Bottomless bowls: why visual cues of portion size may influence intake. *Obes Res*. January 2005;13(1):93-100.
24. Wansink B, Chandon P. Meal size, not body size, explains errors in estimating the calorie content of meals. *Ann Intern Med*. September 5 2006;145(5):326-332.
25. Young L, Nestle M. The contribution of expanding portion sizes to the US obesity epidemic. *Am. J. Public Health*. 2002;92:246.
26. Ledikwe JH, Ello-Martin JA, Rolls BJ. Portion sizes and

- the obesity epidemic. *J Nutr*. April 2005;135(4):905-909.
27. Food Marketing Institute. Supermarket facts: industry overview 2005. http://fmi.org/facts_figs/superfact.htm. Accessed November 13, 2006.
 28. United States Dept. of Agriculture. Economic Research Service. The U.S. food marketing system. <http://purl.access.gpo.gov/GPO/LPS34901>. Accessed November 13, 2006.
 29. Food Marketing Institute. Key facts: How \$100 is spent. Facts and Figures. http://www.fmi.org/facts_figs/keyfacts/spend.htm. Accessed November 16, 2006.
 30. Handy CR, Kaufman PR, Park K, Green GM. Evolving marketing channels reveal dynamic US produce industry. *Food Review*. 2000;23(2):14-20.
 31. Morland K, Wing S, Diez Roux A, Poole C. Neighborhood characteristics associated with the location of food stores and food service places. *Am J Prev Med*. January 2002;22(1):23-29.
 32. Morland K, Diez Roux AV, Wing S. Supermarkets, other food stores, and obesity: the atherosclerosis risk in communities study. *Am J Prev Med*. April 2006;30(4):333-339.
 33. Morland K, Wing S, Diez Roux A. The contextual effect of the local food environment on residents' diets: the atherosclerosis risk in communities study. *Am J Public Health*. November 2002;92(11):1761-1767.
 34. Gallagher M. Examining the impact of food desserts on public health in Chicago. 2006. <http://www.lasallebank.com/about/pdfs/report.pdf>. Accessed November 30, 2006.
 35. Harris JM, Kaufman P, Martinez S, Price C. The U.S. food marketing system, 2002. Washington: U.S. Department of Agriculture, Economic Research Service; August 2002. <http://www.ers.usda.gov/publications/aer811/aer811.pdf>. Accessed November 17, 2006.
 36. Kaufman PR. Consolidation in food retailing: prospects for consumers & grocery suppliers. Washington: U.S. Department of Agriculture, Economic Research Service; August 2000.
 37. National Association of Convenience Stores. What is a convenience store? *Industry Resources*. http://www.nacsonline.com/NACS/Resource/IndustryResearch/what_is_a_cstore.htm. Accessed November 17, 2006.
 38. California Federation of Certified Farmers' Markets. What is a certified farmers' market? <http://www.cafarmersmarkets.com/about>. Accessed November 17, 2006.
 39. California obesity prevention plan: a vision for tomorrow, strategic actions for today. California Department of Health Services; 2006.
 40. Governor's vision for a healthy California. http://www.cnr.berkeley.edu/cwh/PDFs/Summit_Governors_Vision.pdf. Accessed September 18, 2006.

ACKNOWLEDGMENTS

The California Center for Public Health Advocacy (CCPHA) gratefully acknowledges Diana Cassady, DrPH and Susan Handy, PhD of the University of California, Davis for GIS analyses and general consultation, Nancy Adess for editing, and Bonnie Fisk-Hayden for graphic design.

Support for this project was provided by a grant from the California Vitamin Cases Consumer Settlement Fund.

SUGGESTED CITATION

California Center for Public Health Advocacy. *Searching for Healthy Food: The Food Landscape in California Cities and Counties*. January 2007.

Copies of this publication and an expanded methodology can be accessed online at www.publichealthadvocacy.org/searchingforhealthyfood.html.

SCIENTIFIC ADVISORY PANEL

CCPHA convened a panel of experts to review the findings of the analysis and to provide insight on the policy recommendations. The Scientific Advisory Panel included Deborah Cohen, MD, MPH (RAND Corporation); Calvin Freeman (Calvin Freeman & Associates); Richard Jackson, MD, MPH (University of California, Berkeley); Leslie Mikkelsen, RD, MPH (Prevention Institute); Michael Rodriguez, MD, MPH (University of California, Los Angeles); and Victor Ruben, PhD (PolicyLink). Affiliations are listed for information only.

The views expressed in this policy brief are those of CCPHA and do not necessarily reflect the views of the members of the Scientific Advisory Panel or their institutions.

ABOUT THE CALIFORNIA CENTER FOR PUBLIC HEALTH ADVOCACY

The California Center for Public Health Advocacy is an independent, nonpartisan, non-profit organization that raises awareness about public health issues and mobilizes communities to promote the establishment of effective health policies. The California Public Health Association-North and the Southern California Public Health Association founded the Center in 1999. CCPHA is currently supported by grants from The California Endowment, the California Vitamin Cases Consumer Settlement Fund, and Kaiser Permanente, as well as by private contributions.

STAFF

Davis Office

Harold Goldstein, DrPH, *Executive Director*
Stefan Harvey, *Assistant Director*
Nikki Baumrind, PhD, MPH, *Research Director*
Amanda Purcell, MPH, *Policy Director*
Alyssa Walker, *Policy Analyst*
Mehdi Niyati, *Finance Manager*
Peyton Fell, *Office Manager*

PO Box 2309
Davis, California 95617
530 297-6000 telephone
530 297-6200 fax
www.publichealthadvocacy.org

Los Angeles Office

Rosa Soto, *Los Angeles Regional Director*
Christina Cardenas, *Advocate Coordinator*
Belinda Campos, *Project Assistant*

PO Box 2277
La Puente, California 91746
626 961-1179 telephone
626 961-1609 fax

BOARD OF DIRECTORS

Fran Jemmott, *Chair*
Julie Williamson, MPH, *Immediate Past Chair*
Adele Amodeo, MPH, *Treasurer*
Calvin Freeman, *Secretary*
Denise Adams-Simms, MPH
Felix Aguilar, MD, MPH
Ellen Alkon, MD, MPH
Marice Ashe, JD, MPH
Martin Gallegos, DC
Jim Keddy
Bernie Weintraub, MPH

© January 2007 CCPHA





Searching for Healthy Food

The Food Landscape in California Cities and Counties

JANUARY 2007

DETAILED METHODOLOGY

INTRODUCTION

This study used commercial data sources and Geographic Information System (GIS) software to examine the distribution of retail food outlets in California communities. This document describes the data sources used, refinements to those data sources, the mapping of the retail outlets, and the construction of an index describing the relative abundance of different types of retail food outlets.

DATA SOURCES

Food Retailers. A dataset was purchased from ESRI (Redlands, CA), a private vendor, in Spring, 2005. It included more than 88,000 food retailers in California. From this dataset, the following four types of food retailers were selected for inclusion in this study.

- **Fast-food restaurants** were defined following the National Restaurant Association's distinction between "table service" and "quick service (fast-food)" restaurants. In addition to counter service, fast-food restaurants are characterized by meal service (vs. snacks, dessert, coffee) and low price (less than \$7/meal). We began with businesses with a North American Industry Classification System (NAICS) code for restaurants (72211002, 72211011, 72211012, 72211013, 72221101, 72221103, 72211016, 72211020, 72221104, 72221105). From these businesses, we selected restaurants with five or more locations with the same name and that provided counter service meals. Major fast-food chains were included (e.g., McDonald's, Taco Bell, Carl's Jr.), as were smaller, regional or locally owned chains. In all, 14,823 fast-food restaurants are included in this study.
- **Convenience stores** were defined as businesses with NAICS code 44512001 that do not sell gasoline or other fuel. This list includes primarily 7-Eleven's and other chains (n=2,752). In order to include smaller chains and family-owned convenience stores, we included businesses with NAICS codes for supermarkets and grocery stores (44511001, 44511002, 44511003, 44511004, 44511005) that had two or fewer employees (n=3,914). In all, there are 6,659 convenience stores in this study.
- **Supermarkets** were identified based on a modification of the Food Marketing Institute definition of a supermarket as a business that sells a variety of food and that earns annual revenues of \$2 million or more each year. To include smaller markets that sometimes play an important role in urban communities, the selection criterion was defined as businesses with annual revenue greater than or equal to \$1 million *or* that were members of a chain (either a national chain such as Safeway, Albertsons, Trader Joe's, or a regional chain such as La Superior, Nugget, Henry's, 99 Ranch) *or* with the word "supermarket" in the business name (n=3,902). NAICS codes included 44511001, 44511002, 44511003, 44511004, 44511005. In all, 3,853 supermarkets are included in this study.

- **Produce vendors** were defined as the sum total of **produce stores** and **farmers markets** for a region. Produce stores included all businesses with NAICS codes 44523001, 44523003. Farmers markets included all certified farmers markets listed on the web site of the California Federation of Certified Farmers' Markets (www.cafarmersmarkets.com). We adjusted the number of farmers markets to include only markets in unique places. For example, the Davis Farmers Market is held both Wednesdays and Saturdays; we included only a single location record for this market. We obtained the location of farmers markets from the federation's web site, www.cafarmersmarkets.com. This information was then geocoded in ArcGIS 9. Actual physical locations were used instead of mailing addresses (which were provided in downloadable files from the web site). In all, 847 produce stores and 445 farmers markets are included in this study.

GEOSPATIAL AND POPULATION DATA

For our analysis of geographic boundaries, we utilized a number of geospatial data from a variety of publishers. Principally, we have used geodata published by the California Spatial Information Library (<http://casil.ucdavis.edu/>); these data include county boundaries and congressional districts.

City designation took one of three forms: geocoding (as provided by California Department of Health Services), Census Designated Place, or proximity to Geographic Names Information System populated place (<http://geonames.usgs.gov/index.html>).

Census boundaries were obtained from the California Office of Statewide Health Planning & Development (<http://www.oshpd.cahwnet.gov/>) and value-added census tabular data were obtained from the California Governor's Office of Emergency Services (<http://www.oes.ca.gov/>). Calculation of the RFEI was restricted to counties and cities determined by census and population projections to have a population of at least 250,000, as reported by the California Department of Finance for January 1, 2005 (<http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPapers/Estimates/E1/documents/E-1table.xls>).

All data were transformed to conform to the California Teale projection (Albers Equal Area NAD27), if not already transformed.

DATA ANALYSIS

Data sources were mapped using geographic information software ESRI ArcGIS v9.0 (ESRI; Redlands, CA). Tables were constructed of counts of the number of retail food outlets of each type within census tracts. Data for census tracts were aggregated to construct tables summarizing the number of each type of retail food outlet by geographic region. Geographic regions included the state as a whole, and cities and counties with populations of greater than 250,000.

CONSTRUCTION OF THE RETAIL FOOD ENVIRONMENT INDEX (RFEI)

The number of supermarkets, produce vendors (produce stores and farmers markets), convenience stores and fast-food restaurants was determined for each census district in the state. Census districts were then summed for various geographic regions to determine the total count of each type of retail food outlets in cities and counties. The Retail Food Environment Index (RFEI) was then constructed as follows: the numerator was comprised of the sum of the number of convenience stores and fast-food restaurants, while the denominator was comprised of the sum of the number of supermarkets and produce vendors. The index was determined for the various geographic areas, using geospatial data as described above.

QUALITY CONTROL

In addition to the use of Access queries, Microsoft Excel was used to perform random accuracy checks. The results were recalculated manually for several random counties and other geographic units by sorting and summing the figures for each unit, then comparing the results obtained in the worksheet to those in the final tables.

ADDITIONAL POINTS

- The exclusion of convenience stores associated with gas stations from the analysis leads our study to undercount the total number of convenience stores in geographic areas. This will tend to bias the numerator of the RFEI downward.
- The use of an annual sales cutoff of \$1 million to define supermarkets rather than the industry standard of \$2 million leads our count of supermarkets to include small neighborhood stores as well as larger supermarkets. This will tend to bias the denominator of the RFEI upward.
- The two points above together lead to a downward bias in our RFEI estimate for any given geographic area.



This paper provides a comprehensive overview of the research conducted for the study, *Searching for Healthy Food: The Food Landscape in California Cities and Counties*, available at www.publichealthadvocacy.org/searchingforhealthyfood.html.

Support for this project was provided by a grant from the California Vitamin Cases Consumer Settlement Fund.

For additional information, contact CCPHA at PO Box 2309, Davis, CA 95617; 530 297-6000;

www.publichealthadvocacy.org.

© January 2007 CCPHA



Searching for Healthy Food

The Food Landscape in California Cities and Counties

JANUARY 2007

POLICY RECOMMENDATIONS

There is increasing evidence that what we eat and the likelihood of being obese are influenced by the foods available in neighborhoods—the food landscape or food environment. Given the uneven distribution of food outlets in California communities, the California Center for Public Health Advocacy calls on federal, state and local policy makers to enact policies to accomplish the following:

1. **Increase the number of grocery stores and other produce vendors in neighborhoods that have limited access to fruits, vegetables, and other healthy foods.** State and local governments should implement policies that stimulate and support retail projects that provide access to healthy foods through strategies such as grants, loans, and zoning regulations.
2. **Support other innovative retail strategies to increase the availability of fruits, vegetables, and other healthy foods in California neighborhoods.** State and local governments should support nontraditional approaches to expanding access to healthy food—such as mobile vendors, direct farm-to-consumer sales, healthier options at fast-food restaurants, and training and technical assistance for retailers.
3. **Set reasonable limits on the number of fast-food restaurants and convenience stores in California neighborhoods.** The health implications of these establishments should be considered in the community design and permitting process. State and local governments should seek a balance of retailers that support both the economic and health needs of communities.
4. **Utilize federal nutrition assistance programs, such as Food Stamps and WIC, to make fruits, vegetables, and other healthy foods more affordable to low-income families.** Even with food assistance programs, many families find it difficult to afford healthy food. Increasing families' financial ability to purchase healthy foods will increase the demand for healthy food retailers. State and local governments should enhance assistance programs so that families are better able to purchase healthy foods. For example, the state should fund the fruit and vegetable incentive program established through AB 2384 (Leno, 2006).
5. **Require food retailers such as fast-food restaurants to provide consumers with nutritional information for all items on menus and menu boards.** Given the proliferation of fast-food restaurants and convenience stores, consumers need immediate access to the nutrient content of items sold by these retailers so that they can make healthier choices. State and local governments should require retailers to post nutrition information on menus and menu boards.