

**1998  
CALIFORNIA  
TEEN EATING,  
EXERCISE, AND  
NUTRITION SURVEY**

ALSO PROFILING  
BODY WEIGHT AND TOBACCO USE

**MEDIA HIGHLIGHTS**

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The Cancer Prevention and Nutrition Section was established in 1986 to develop technical capacity for CDHS to conduct large-scale dietary improvement initiatives. Its activities include conducting the California Dietary Practices Surveys of adults, adolescents, and children and convening public/private partnerships that sponsor the California 5 a Day-for Better Health! Campaign, the Children's 5 a Day-Power Play! Campaign, the Latino 5 a Day Campaign, and the California Nutrition Network for Healthy, Active Families.

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## FOREWORD

This first representative survey of eating and exercise habits of California's over two million adolescents, ages 12- to 17-year-old, confirmed what most other research finds: even during one of the most disease-free stages of life, the prevalence of lifestyle risk factors that lead to later ill health is high. On a typical late winter day in 1998, seven of ten California teens – or 1.5 million young people – did not eat the minimum number of fruits and vegetables or get the recommended hour of vigorous physical activity needed for good health. Three of ten teens were at-risk or already overweight, which was twice the expected rate. This means that well over 600,000 adolescents are likely to have a weight placing them at high risk of becoming an overweight or obese adult.

Most of the positive health habits measured in this survey declined from junior to senior high school. Not surprisingly, age-related disparities also began appearing as adolescence progressed. The most notable was the co-occurrence of poor diet with both tobacco use and physical inactivity.

This report puts California's experience into context by highlighting findings of other research about adolescent health. The picture that has been revealed is one of declining dietary quality and increasing rates of overweight over the last decade or so. These patterns appear to contribute to a higher prevalence of heart disease risk factors and the new phenomenon of type 2 diabetes in overweight adolescents. Both phenomena appear to strike adolescents of color most often, showing that the foundations for health disparities seen later in life start in youth.

This survey also found that modifiable factors were correlated with positive health habits. For example, teens who recalled having a class on nutrition or on the health benefits of physical activity had better eating and exercise profiles, as did those who reported having positive attitudes, specific health knowledge, and skills.

By confirming that California adolescents are being exposed to lifestyle factors that jeopardize their long-term health, the 1998 California Teen Eating, Exercise, and Nutrition Survey (CaITEENS) offers concerned adults and policy makers information with which to plan a course of action. It challenges parents and other adults to do three things simultaneously: to help teens develop the personal skills needed for healthy eating and exercise; to assure that their home, community, and school environments support healthier lifestyles and minimize exposure to negative influences; and to provide health services that anticipate chronic disease risks and intervene early. Fortunately, there are many effective programs designed especially for adolescents that could be expanded to reach the large numbers of teens who need them.

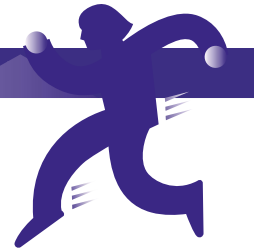
What is California's vision for the health of its adolescents? What goals should be set, and by when should they be achieved? What are the strategies and tactics to meet those targets? No doubt, it will take action not just by government, but also by the business and nonprofit sectors. Let us begin.

Sincerely,



Carmen Rita Nevarez, M.D., M.P.H.  
Vice President for External Relations  
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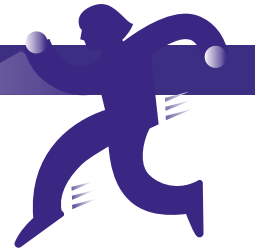
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## MEDIA HIGHLIGHTS

The 1998 *California Teen Eating, Exercise, and Nutrition Survey (CalTEENS)* is the first comprehensive statewide diet and physical activity survey conducted among California adolescents. It was designed to provide a baseline against which progress can be measured in the future. *CalTEENS* asks about other modifiable lifestyle characteristics such as tobacco use, body weight, knowledge, attitudes, beliefs, environmental factors, and school performance. This allows for multiple types of analysis and provides insight about possible causal relationships and ways to correct the problems.

These Highlights are excerpted from a more extensive report that is available from the Public Health Institute or the Cancer Prevention and Nutrition Section of the California Department of Health Services.

### Introduction

*CalTEENS* was conducted as a telephone survey of 1,213 randomly selected 12 to 17-year-olds in California in February, March and April of 1998. The *CalTEENS* instrument was adapted from the instruments used in the *California Dietary Practices Survey of Adults*, the *Behavioral Risk Factor Surveillance System*, and the *California Youth Tobacco Survey*. Parental permission was obtained for all interviews, and the youth response rate was 85 percent.

The teens were asked about their previous day's consumption of fruits and vegetables; other foods high in dietary fiber (whole grain breads/tortillas, high fiber cereals, and beans); milk products; beef; and high fat/sweet foods. Questions about other food items were asked in terms of times eaten on the prior day. Physical activity questions covered each type of physical activity taken on the previous day, its duration in minutes, and, if appropriate, the distance walked, run, jogged, or swum. Participation in physical education, organized sports, computers, and TV watching was reported. A short module assessed smoking prevalence.

Weight, height, and self-rated academic performance were also reported. Attitudinal and environmental questions were asked about a variety of other factors associated with health behaviors, such as eating out, school lunches, belief about the foods needed for good health, and barriers and motivations for healthy eating and physical activity. No information about socioeconomic status was asked, but respondents reported the amount of money available to spend on themselves and whether they had a job.

The sample was weighted to the 1990 Census for California, the most recent source of population statistics. In this report statistical differences were mentioned only if p-values were less than or equal to .05. The values on figures were denoted by asterisks ( $p < .05 = *$ ,  $p < .01 = **$ ,  $p < .001 = ***$ ). If means were statistically significant, follow-up analyses were conducted to test for differences between groups.



## Principal Findings

This first representative survey of California adolescents found that in 1998:

- Just two percent of adolescents met all five dietary recommendations in the *California Daily Food Guide* (1990).
- Almost half of all teens reported eating no vegetables at all on a typical day. Only 23 percent of boys and 38 percent of girls reported eating the minimum amount of fruits and vegetables—7 servings for boys and 5 for girls—needed daily for good health.
- The Healthy Eating Practices Score, a measure of seven simple healthy food habits, was about the same as in adults, in spite of higher food intake by adolescents.
- Only 29 percent of adolescents reported getting the recommended minimum of one hour of vigorous physical activity per day, with girls getting the least. By the junior and senior years of high school, only about half of all adolescents took physical education.
- Twice as much time was spent watching TV or playing video games as being physically active, and six times more time was spent watching TV as with a computer doing homework.
- Nearly one in three adolescents was at risk or already overweight, twice the expected rate. Rates were highest in Latino and African-American teens.
- In general, as California adolescents moved toward adulthood, dietary and physical activity habits declined, rates of overweight in boys rose, and tobacco use increased sharply.
- These trends appear to be consistent with those reported for the Nation as a whole.
- Unhealthy eating and exercise habits were likely to be reported more by adolescents who also said they used tobacco or did less well in school.
- More positively, there were remarkably strong correlations between reported behavior of California adolescents and the behavior change theories used in adolescent behavioral research. This finding suggests that well-designed interventions would be effective in modifying adolescent eating and exercise behaviors on a large scale.
- Healthy eating habits and healthy physical activity practices were more likely to be reported among teens who reported having taken classes on healthy eating or on the health benefits of physical activity, respectively.
- There also were consistent positive correlations between self-rated academic performance and healthy eating, tobacco avoidance, and having had classes on the health benefits of physical activity.



## Health Implications

Although it is risky to make long-term projections about chronic disease rates, with what is known today, the new *CalTEENS* statistics have very serious implications. The prevalence rates of poor diet, physical inactivity, and overweight are high in California adolescents. All available evidence suggests that if these risk factors remain unchecked, high rates of hypertension, high blood cholesterol, coronary heart disease, stroke, type 2 diabetes, and cancer will follow. Cardiovascular events in these adolescents could appear in state health statistics in as little as 15 years, because adults with multiple cardiovascular risk factors as adolescents begin to experience serious disease events as early as their 30's.

Further, many of the risk factors are higher in African-American and Latino adolescents, so it is likely that—if left unchecked—these groups will experience more serious chronic diseases than will white or Asian/other groups. Especially for Latino young people, it seems likely that they will have higher rates of chronic diseases than their parents' generation.

More optimistically, *CalTEENS* found consistently strong, positive associations between behavior-specific attitudes—such as believing that a specific number of servings of foods was needed for good health—and eating that amount. This was true for all food groups. In addition, there were consistently strong, positive associations between the theoretical factors used in designing health promotion programs and adolescents' reported behavior. These two findings, together with a lower perception of barriers to healthy eating and exercise than were seen in adults, suggest that adolescents would be responsive to well-designed health promotion campaigns of the type recommended by national health authorities.

Experts define well-designed interventions as having to include multiple components that work together and are delivered simultaneously in different channels that reach teens and their caretakers. To be effective, interventions must reach adolescents at school, at home and through their family life, in community youth organizations, in health care, and through businesses, including the media and product marketing.

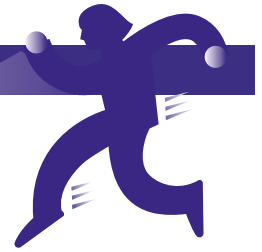
Effective interventions also must include societal approaches that result in long-term, sustainable changes in the environment and in organizational policies that make healthy eating and physical activity easy. Education alone and programs targeting individuals rather than entire social groups are insufficient.



## Major Recommendations

Many experts have called for population-wide efforts in nutrition, physical activity and obesity prevention like those proved successful in tobacco control. This is because the dimensions of the problem and the subsequent health impact of poor diet/physical inactivity are so similar to those of tobacco use. New information from the *California Teen Eating, Exercise and Nutrition Survey (CalTEENS)* supports the following policy measures to reverse what appear to be deteriorating health conditions in California adolescents:

- 1. Increase public awareness about the extent and causes of poor eating and exercise habits in adolescents and adults, the apparently increasing rates and patterns of overweight in teens, and the serious health, educational, and economic implications for adolescents.**
- 2. Communicate to parents, educators, health professionals, and other adults who work with adolescents about the population-based environmental and policy strategies that are available to promote healthy eating and exercise so they can incorporate appropriate measures in their own settings.**
- 3. Set reasonable expectations for slowing or reversing the rise in rates of and risks from obesity. Proceed with caution when implementing health promotion programs and policies to avoid stigmatizing at-risk and overweight adolescents, and put measures in place to prevent or eliminate size discrimination.**
- 4. Promote leadership from the food and fitness industries, as well as other businesses that market to adolescents, to modify the design and marketing of products that have a negative impact on dietary quality, physical activity, body image, and overall health attitudes and beliefs.**
- 5. A coordinated state-national response also should be organized by units of the Federal Government, with the Centers for Disease Control and Prevention continuing its active leadership role. Similar to the early stages of other epidemics, an action-oriented grants program conducted in partnership with states and other national leadership organizations should be initiated.**



## Why Healthy Eating and Physical Activity Are Important for Teens

Although drugs, violence and smoking are recognized as urgent health concerns for adolescents, it is during this apparently-healthy period that other dangerous lifestyle habits begin to solidify. Poor diet, physical inactivity, and overweight track into adulthood where they will contribute to early onset of multiple serious chronic diseases. Public health research focuses on the following issues:

### Obesity

Overweight in adolescents has increased dramatically in a short time. From 1988 to 1994, about 11 percent of U.S. adolescents, aged 12-17 years, were found to be overweight. This was twice the statistically-expected prevalence of 5 percent of the population. The increase in overweight has occurred primarily among the older and heavier adolescents where persistence into adulthood is most likely. The chance for overweight adolescents to reach normal weight as an adult is less than 50 percent.

The health impact of adolescent overweight does not take a lifetime to appear. The Bogalusa Heart Study found that, even for adolescents in the top quartile of Body Mass Index (BMI), their rates of cardiovascular risk factors were higher by age 30. The heart disease risk factors that appeared prematurely included high blood pressure, cholesterol, triglycerides, LDL cholesterol, and insulin, and low HDL cholesterol.

Overweight in adolescence also is linked with negative educational, economic and social consequences appearing as early as the mid-20's. Especially for women, the negative consequences include completing fewer years of school, lower likelihood of being married, lower household income, and higher likelihood of living in poverty.

### Type 2 Diabetes in Youth

Pediatric diabetologists and others working in minority communities are concerned that the rise in overweight may be causing what has been called an epidemic of type 2 diabetes affecting African-American, Mexican-American, and Native-American youth. In one Midwestern medical center, rates of type 2 diabetes in youth, ages 10 to 19 years, rose from 3 to 10 percent of all diabetes before 1992 to 33 percent by 1994. Severe obesity (BMI  $\sim$ 38 kg/m<sup>2</sup>) is one of the major risk factors for pediatric type 2 diabetes.

### Cardiovascular Risk Factors in Adolescents

Strong, persistent ethnic differences in cardiovascular risk factors have been identified in children and adolescents participating in the National Health and Nutrition Examination Survey, 1988-1994. Overweight levels were found to be higher for non-white girls as early as 6 to 9 years, and the disparity between ethnic



groups widened as the children got older. The percent of calories from fat was highest in non-white girls and in African-American boys. Blood pressure levels were highest for African-American girls, while the early signs of abnormal blood sugar were highest in non-white children. Differences appeared as early as 6 to 9 years of age. In contrast, smoking was highest in white youth.

There is evidence to suggest that the direct effects on the heart occur at an early age. In one study, thickening and damage to coronary artery walls was found in one of every six adolescent heart transplant donors.

### **Osteoporosis**

Osteoporosis has been described as a pediatric disease that manifests itself late in life when there is no cure. The direct medical costs of \$9 billion annually are expected to exceed \$60 billion by 2020 due to the aging of the United States' population. Prevention is believed possible by establishing maximum bone mass during adolescence and early adulthood through the consumption of high calcium foods. It is not possible later in life to reach optimal bone mass to make up for an adolescent calcium deficit. Soda consumption by adolescents is associated with decreased intake of calcium, vitamin C, and folate.

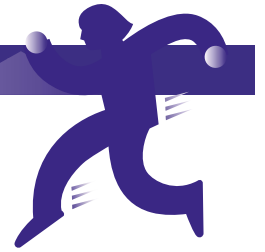
### **Cancer Prevention**

The types of cancers that affect adolescents are not diet- or physical activity-related, but one-third of adult cancers are. Protective factors include fruit, vegetable, and whole grain consumption, physical activity, and possibly dietary calcium. Diet-related risks include alcohol, total and saturated fat, excessive intake of meat and full-fat dairy products, and obesity. Since the incubation periods for most cancers span several decades, forming early in life the habits of eating a plant-based diet, exercising, and keeping weight normal, provide the maximum lifetime preventive benefit.

### **Out-of-Home Eating and Fast Food**

One-third of total calories consumed by adolescents come from food outside the home. This is significant because such foods are generally higher in fat and cholesterol, and when fast food is the choice, fat and cholesterol are higher still. Fast food is the most frequent source of food away from home for boys and equal to the school cafeteria for girls. Nationally, teens eat fast food two to three times a week.

Fast food is no longer a stranger to the school cafeteria. It is estimated that 13 percent of American public high schools sell branded fast food, up from 2 percent in 1991. Many fast foods are not eligible for federal reimbursement, so they compete directly with the healthier alternatives sold by the school cafeteria. Foodservice advertising and promotion were estimated to total \$3.1 billion in 1997. Most of this was for fast foods.



## Dietary and Physical Activity Needs of Adolescents

Nutrition research shows that the nutritional problems of adolescents include under-nutrition, iron deficiency anemia, overweight, unsafe weight loss methods, eating disorders, and dental caries. National surveys find that fruit and dairy foods are the food groups least likely to be eaten at recommended levels. Fruit and vegetable intake in U.S. adolescents fell far short of the recommended 5 daily servings during the 1989 to 1991 period. Adolescents between 15 and 18 years consistently had the lowest Healthy Eating Index score of any age group. Their score was markedly lower than that of the 11-14 age group.

In adolescents, nutrition and physical activity influence growth and the development of bone, muscle, and fat. Patterns developed before and during adolescence track into early adulthood and later life. The capacity for aerobic activity increases with age, peaking in girls at puberty and decreasing as body fat rises, while in boys, it peaks between 18 and 20 years of ages. Strength in boys peaks at age 20, while it does so at about age 17 years in girls. Since rates of leisure physical activity are positively related to a higher social class and the patterns within families tend to be similar, it follows that adolescents from poorer families would exercise less and be heavier.

The *Dietary Guidelines for Americans* (2000) recommend that children and adolescents engage in vigorous physical activity for at least 60 minutes a day.

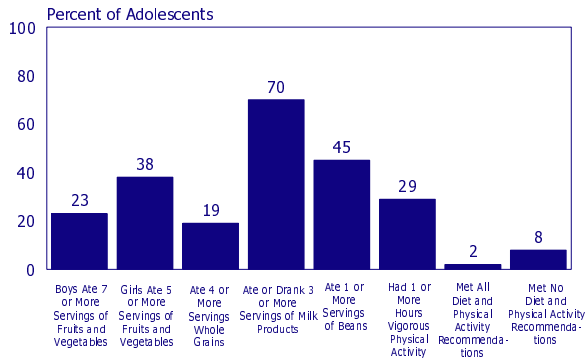
In this report, California's dietary guidance policy as outlined in the *California Daily Food Guide* is used as the standard against which the survey results are compared. It reflects the higher nutrient needs of adolescents and recommends:

- 5 servings or more of fruits and vegetables every day for adolescent girls and 7 servings or more every day for adolescent boys;
- 4 servings or more of whole grain breads, cereals, and grains every day (plus additional servings of other grains, to total at least 7 servings every day);
- 3 servings of fat free/1% milk products every day;
- 2 small servings of lean animal protein (totaling 5 ounces for adolescent girls and 7 ounces for adolescent boys), or a vegetarian alternate;
- 1 serving of beans every other day;
- 1 hour or more of active play or vigorous physical activity every day.

These dietary recommendations are consistent with those of the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services for teens.



**Figure 1: California Adolescents Who Met Minimum Recommendations 1998**



Source: Public Health Institute, 2000

## Healthy Eating by California Adolescents

A minority of teens reported meeting any of the key dietary recommendations, except for milk. Only three in ten met the recommendation for fruits and vegetables, and one in five met the recommendation for whole grains. However, seven in ten met the recommendation for milk products, and almost half ate beans, very close to the recommendation. Three in ten reported meeting the recommendation for one hour of vigorous physical activity.

## Consumption of Fruits and Vegetables

In 1998, adolescents ate an average of 4.3 servings of fruits and vegetables, consisting of 3.0 servings of fruit or juice and 1.3 servings of salad or vegetables (including french fries). Younger boys, non-smokers, and teens who reported exercising regularly ate more fruits and vegetables than older boys, smokers, and teens who did not report regular exercise. At 4.6 servings, Latino adolescents reported the greatest consumption of fruits and vegetables, followed by 4.4 servings for African-American adolescents.

About one in five boys and two in five girls reported eating the minimum number of servings of fruits and vegetables needed for good health. Girls were significantly more likely to reach their goal of 5 servings a day than boys were to reach the target of 7 servings a day. California adolescents exceeded the minimum goal for fruit, which is 2 daily servings for girls and 3 servings for

boys. However, they fell short of meeting their vegetable goals by almost 2 daily servings for girls and 3 daily servings for boys.

About half of adolescents believed that they should eat 5 or more daily servings of fruits and vegetables for good health. Adolescents who believed that at least 5 daily servings were needed were significantly more likely to report eating 5 servings of fruits and vegetables. Similarly, adolescents who thought they should eat 0-2 servings were more likely to report consuming the lower amount of fruits and vegetables.

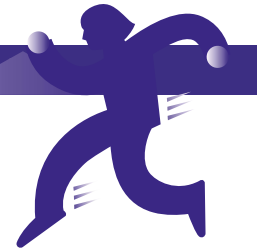
The most important motivations for eating fruits and vegetables were “good health” and “liking the taste.” “Health” as a motivation decreased with age for both boys and girls, while that of “taste” and “other” factors increased. “Availability”, “choosing other foods”, “not thinking” about fruits and vegetables, and “taste” were the most commonly cited barriers.

**Table 1: Correlation Between Belief and Action among California Adolescents, 1998: Eating 5 Servings of Fruits and Vegetables**

Amount Believed Was Needed	Actual Servings Eaten, Percent		
	0-2	3-4	5+
0-2	47	26	26***
3-4	37	30	33
5+	22	29	49

\*\*\* p < .001

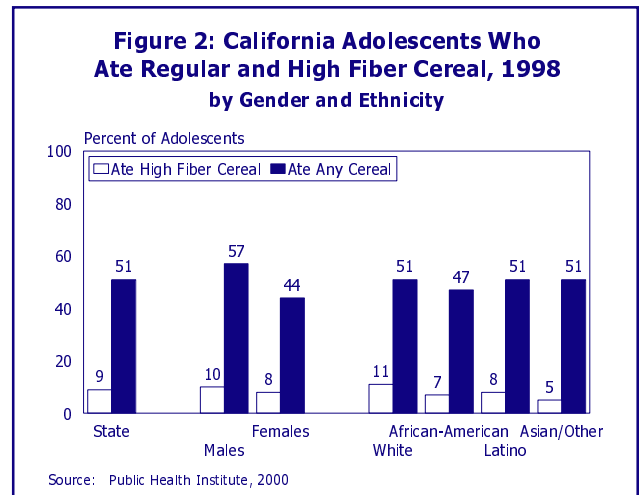
Source: Public Health Institute, 2000



## Consumption of Whole Grain Products, Higher Fiber Cereals, and Beans

Seven in ten adolescents reported eating any whole grain bread or higher fiber cereal, but only two in ten met the recommendation to eat 4 or more daily servings. Most of the reported servings of higher fiber foods were from whole grain breads. Although over half of all adolescents reported eating breakfast cereal on the survey day, fewer than one in ten chose a higher fiber variety. Asian/other adolescents were least likely to report eating higher fiber breakfast cereals, while white adolescents were most likely to report doing so.

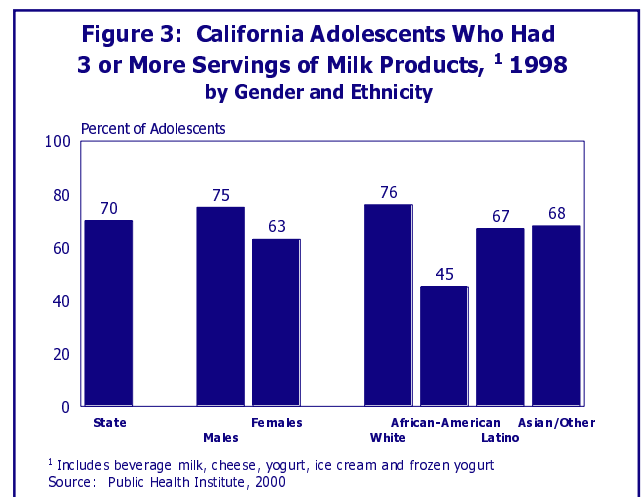
Adolescents were more likely to meet the recommendation for beans than they were any other food group. Nearly half said they had eaten at least 1 serving on the survey day, coming very close to the State recommendation. Almost three out of five Latino adolescents reported eating beans, but only about one in four African-American adolescents did so.



## Consumption of Milk Products

Adolescents averaged 4 daily servings of milk products (beverage milk, cheese, yogurt, ice cream, and frozen yogurt), but several population groups had markedly lower consumption. Only about half the girls aged 16-17 and fewer than half the African-American adolescents reported getting 3 servings. Two percent fat milk was the most common type of milk consumed. It was drunk twice as often as any other type of milk. More than two in five adolescents reported drinking 2% fat milk, with about one in five reporting each of the other types: fat free, 1% fat, and whole milk.

Three-fourths of adolescents thought they needed at least 3 servings of milk products each day. For fluid milk and cheese, adolescents who believed they needed 3 or more servings reported consuming a much higher amount than those who thought they needed fewer servings.



The most commonly reported motivations for drinking nonfat or 1% fat milk were “health,” “availability,” and “liking the taste.” However, “not liking the taste” was also the barrier to drinking nonfat or 1% milk reported most often, followed by “not available.” Latino adolescents were least likely and Asian/other respondents were most likely to “dislike the taste.”



**Table 2: Correlation Between Belief and Action: Servings of Beef Eaten by California Adolescents on the Previous Day, 1998**

Amount of Meat Believed Was Needed for Health <sup>1</sup>	Servings of Beef Consumed, Percent		
	0	1	2+
0-1	52	36	12
2	38	44	18
3+	37	40	23

\*\*\* p < .001  
<sup>1</sup> Includes meat, chicken or fish  
 Source: Public Health Institute, 2000

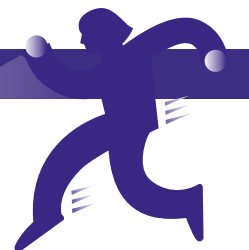
## Meat Consumption

The *California Daily Food Guide* recommends 2 small servings of lean meat, poultry or fish, not to exceed a daily total of five ounces for girls and seven ounces for boys. Beef is the most commonly consumed red meat in California and is therefore used as an indicator of the category in *CaTEENS*.

Three out of five adolescents reported eating beef, such as a hamburger, taco, or a casserole on the survey day. Almost seven in ten boys, but only half the girls, reported eating beef.

One-third of adolescents believed they should eat 2 daily servings of meat, chicken or fish, while one-fourth thought they needed less and about two in five thought they should eat 3 or more servings. Girls age 16-17 were more likely to believe they needed one or fewer servings and less likely to believe they needed 3 or more servings than younger girls.

Similar to the relationship found with other food groups, adolescents who believed they should consume more of these foods reported eating more servings of beef.



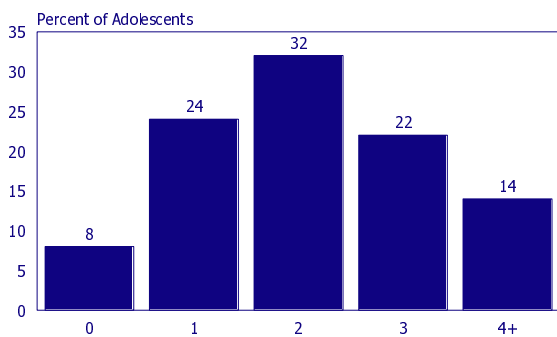
## Less Healthy Eating Practices

### High Calorie, Low Nutrient Foods

Almost seven in ten adolescents reported consuming two or more pastries, fried foods, chips, desserts, or candy/soda on the day preceding the interview. More than one-third ate three or more of these foods. Boys, especially those aged 14-15 years and those not at risk for overweight, were significantly more likely to eat at least two or more different high calorie, low nutrient items. For all foods except sweet snacks, boys ate the items significantly more often than girls. Differences by ethnicity, age, and overweight status for consumption of these items were minimal.

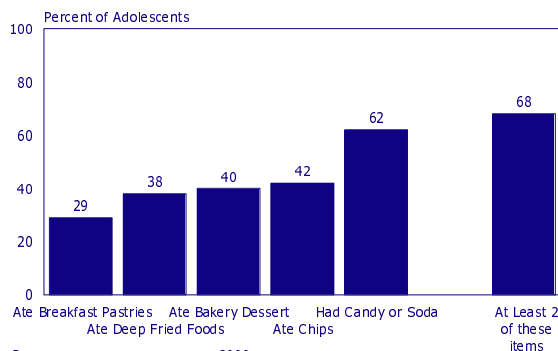
Only about one in ten teens reported eating salad. More positively, when adolescents did report eating salad, nearly half also reported eating a lowfat salad dressing.

**Figure 4: Servings of High Calorie, Low Nutrient Foods Eaten by California Adolescents 1998**



Source: Public Health Institute, 2000

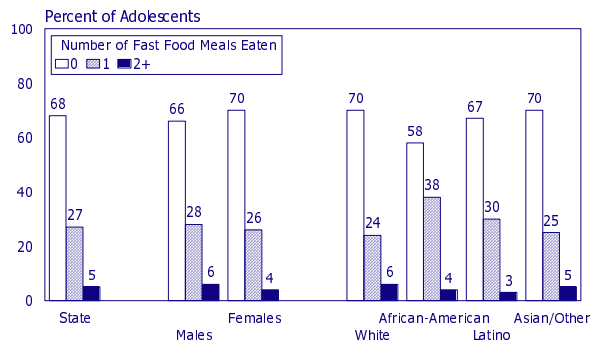
**Figure 5: California Adolescents Who Ate High Calorie, Low Nutrient Foods 1998**



Source: Public Health Institute, 2000



**Figure 6: California Adolescents Who Reported Eating Fast Food Yesterday, 1998 by Gender and Ethnicity**



Percentages may not add up to 100 due to rounding.  
Source: Public Health Institute, 2000

## Fast Food

One-third of adolescents reported eating at least one meal or snack from a fast food restaurant on any given day. African-American adolescents were more likely to do so than those from other racial/ethnic groups. Girls age 16-17 frequented fast food restaurants more often than younger ones. Adolescents who smoked also were more likely to eat fast food than were non-smokers.

Adolescents who ate fast food on the survey day were more than twice as likely to eat deep fried foods like french fries or onion rings than those who did not eat fast food. More than 60 percent of teens who ate fast food reported eating deep fried foods on the survey day, compared to fewer than 30 percent who had not eaten at a fast food restaurant.



## School Lunch Participation

About half of all adolescents who ate lunch on a school day reported eating a school lunch. Adolescents who ate school lunch consumed significantly more servings of fruits and vegetables in one day than adolescents who did not eat a school lunch—4.6 servings compared to 4.1 servings. Eating a school lunch was particularly important to meeting the *5 A Day* goal for African-American and Latino adolescents and for younger teens. The younger adolescents who ate school lunches had more servings of fruits and vegetables (5.1 servings per day) than those aged 14-15 (4.6 servings) or 16-17 (3.9 servings).

The effect of school lunch on daily milk consumption was different for boys and girls. Boys who did not have a school lunch reported drinking more milk than those who had school lunch, 2.7 compared to 2.4 servings, respectively. Girls who did not have school lunch drank less milk than those who did have a school lunch, 1.9 and 2.3 servings, respectively.

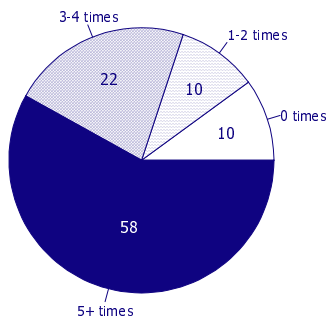
**Table 3: Daily Servings of Fruits and Vegetables Eaten by California Adolescents Who Did and Did Not Eat a School Lunch, 1998 by Ethnicity**

	Had School Lunch	Did Not Have School Lunch
White	4.1	4.3 *
African-American	5.1	2.8
Latino	5.1	4.1
Asian/Other	4.2	4.0

\* p<.05  
Source: Public Health Institute, 2000



**Figure 7: Range in Times Per Week That California Adolescents Took Part in Physical Activity, 1998**



Source: Public Health Institute, 2000

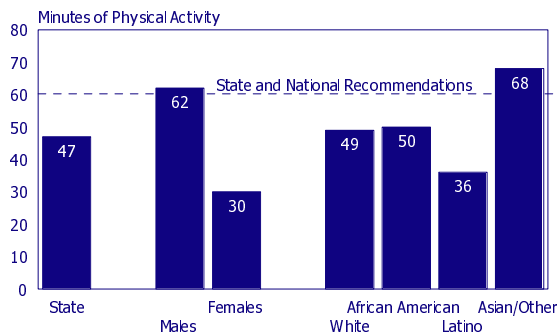
## Physical and Sedentary Activity

In California, four in ten adolescents reported being involved in physical activity less than five times a week, as compared to the goal of being active every day.

Boys were significantly more likely than girls to have participated in vigorous physical activity and sports during the week prior to the study, and they exercised longer. Especially with girls, younger adolescents participated more than older adolescents.

The amount of time spent on physical activity varied among population segments. Adolescents reported a mean of 24 minutes of moderate physical activity and 47 minutes of vigorous physical activity on the day before the survey.

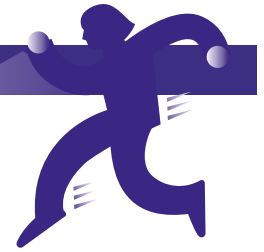
**Figure 8: Minutes of Vigorous Physical Activity Reported by California Adolescents, 1998 by Gender and Ethnicity**



Source: Public Health Institute, 2000

While nearly two in five boys reported getting at least one hour of vigorous activity on the survey day, only half that many girls did so. For vigorous and moderate physical activity combined, boys reported being physically active nearly twice as long as girls, 92 minutes compared to just 48 minutes. Age increased the gap. For girls, vigorous activity declined with age, while for boys, moderate but not vigorous physical activity increased. Asian/other adolescents were much more likely to report participating in one hour or more of vigorous activity than were African-American, white, or Latino adolescents, while white teens were more likely than Asian/other adolescents to report more moderate activity.

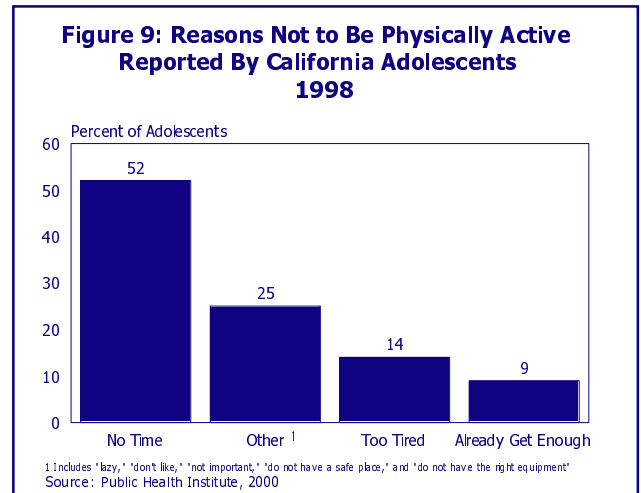
Three-quarters of California adolescents report having physical education in school an average of slightly more than four times a week. Age was the main factor determining enrollment and the amount of physical education. Fewer than six in ten boys and only half the girls age 16-17 reported being enrolled in physical education.



## Physical Activity Motivations and Barriers

Boys and girls gave several reasons for being physically active. “Health” and “strength” were cited as the main reasons, each named by nearly one in three adolescents. Boys stated that they exercised for “fun” significantly more than girls did. Girls exercised for “other” reasons, such as “losing weight,” significantly more frequently than boys did. African-American adolescents reported exercising for strength more often and for fun, less often than did other racial/ethnic groups. Only one in five younger girls, one in ten 14- to 15-year-olds, and one in six older adolescents reported “fun” as a motivating factor.

The biggest barrier to getting more exercise was “time”, cited by over half of all adolescents. Significant differences by ethnicity were observed in the main reasons given for not exercising. White and Asian/other adolescents cited time more than African-American and Latino adolescents. African-American and Latino adolescents said that being “too tired” interfered with getting more exercise more than white and Asian/other adolescents did. For girls, those aged 14 to 15 years were most likely to give time as a barrier, while those 16- to 17-year-olds were most likely to say they were too tired to exercise. Surprisingly, regular exercisers were more likely to give time as a barrier, while irregular exercisers gave “other” reasons significantly more often. There were no significant differences by smoking or weight status.



## Behavior-Specific Beliefs and Physical Activity

Adolescents who thought that they should be either moderately or vigorously active for a specific number of days per week were more likely to report physical activity than those who did not have this belief. These adolescents participated in physical activity significantly more frequently and for a longer duration. For example, those who thought they should be active five or more days a week were active 5.6 times a week compared to 4.7 times a week for those who did not. In addition, they spent more time in both moderate and vigorous physical activity than did those without a time-specific belief.

**Table 4: Correlation Between Belief and Action: Amount of Physical Activity among California Adolescents, 1998**

		Times Active Per week	Minutes of Total Activity "Yesterday"
Think You Should be Moderately Active 5+ Times/Week	yes	5.6 ***	81 ***
	no	4.7	61
Think You Should be Moderately Active 3+ Times/Week	yes	5.2 **	73 **
	no	4.1	40

\*\* p<.01, \*\*\* p<.001  
Source: Public Health Institute, 2000



## Regular Exercise and Healthy Eating

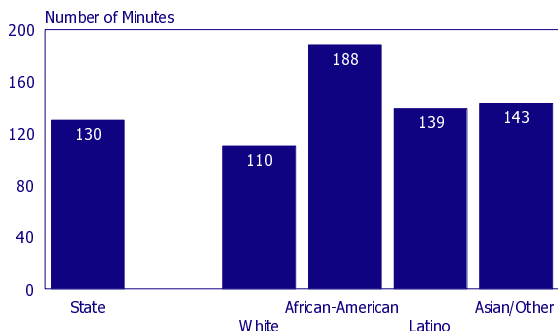
For the purposes of this survey, regular exercisers were defined as those who reported exercising at least three times during the week prior to the interview. Significant differences were observed between the Healthy Eating Practices Scores of regularly and irregularly active adolescents. Regular exercisers had a mean score of 3.2 out of 7 possible points, while irregular exercisers had a mean score of 2.7. The differences between regular and irregular exercisers were demonstrated in the higher fruit and vegetable, whole grain, and milk consumption. In addition, regular exercisers were more aware of recommended goals for fruit and vegetable and whole grain consumption than were irregular exercisers. Regular exercisers reported fewer skipped breakfasts and greater ability to pick out healthy foods from a menu and to cook in a healthy way.

## Sedentary Activities

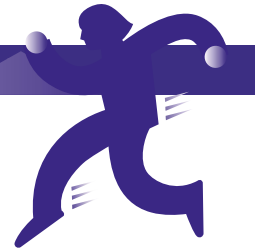
Watching television is believed to contribute to obesity because it reduces the time that could be spent on physical activity and stimulates consumption of foods advertised on television. California adolescents reported spending slightly over two hours a day watching television or playing video and computer games. Non-white adolescents reported significantly higher amounts of game playing/television watching than did white teens. Middle-school-aged youngsters watched television or played on the computer significantly longer than those who were 16-17 years old did. There were no significant differences by gender, smoking, or weight status, but irregular exercisers reported a higher amount of television or game playing than those who exercised regularly.

Conversely, California adolescents spent an average of 22 minutes on the computer for homework, with Asian/other adolescents reporting about twice the amount of time than other ethnicities. Among girls, but not boys, computer use for homework dropped significantly with age.

**Figure 10: Minutes Spent by California Adolescents Watching Television or Playing Video Games, 1998 by Ethnicity**



Source: Public Health Institute, 2000



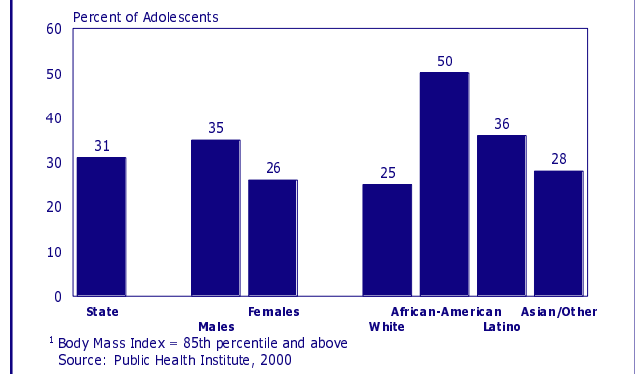
## Body Weight in California Adolescents

Body Mass Index (BMI) is a measure that estimates body fatness. In children and teens BMI is calculated using weight, height, age and gender. Adolescents in the 85<sup>th</sup> percentile are considered “at risk” of overweight, and those in the 95<sup>th</sup> percentile are considered “overweight”. (To avoid stigma, use of the term “obese” is generally avoided with children and teens.) Nationally, ten percent of all adolescents had BMI’s classifying them as overweight (1988-1994).

In the 1998 California Teen Eating, Exercise, and Nutrition Survey (CalTEENS), over one-fourth were found to be “at risk for overweight,” and 7 percent were classified as “overweight.” Boys, African-Americans and Latino teens were more likely to be at risk or overweight than girls, white or Asian/other adolescents.

Half the *CalTEENS* respondents reported ever trying to lose weight. Girls, African- American and Latino adolescents, boys aged 12-13 years, and girls aged 16-17 years reported dieting more frequently than others. The most commonly reported dietary practice was to exercise more, followed by dieting or fasting. One in eight adolescents reported that they were currently trying to lose weight, including one in five who were at risk or overweight.

**Figure 11: California Adolescents At-Risk or Overweight<sup>1</sup>, 1998 by Gender and Ethnicity**

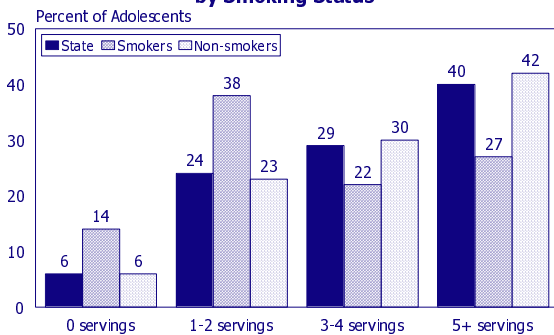




## Tobacco Use Associated with Diet, Weight and Physical Activity

Nationally, about 25 percent of American adolescents smoke on a regular basis by 12<sup>th</sup> grade. In the 1998 *California Teen Eating, Exercise, and Nutrition Survey*, about 12 percent of adolescents reported smoking. Among adolescents 12 to 13 years of age, tobacco use was reported by only 1 to 2 percent, but by ages 16 to 17 years, 17 percent of girls and 25 percent of boys reported smoking. There were significant relationships between tobacco use, dietary behaviors, physical activity, and being at risk of overweight.

**Figure 12: Range in the Number of Servings of Fruits and Vegetables Eaten by California Adolescents, 1998 by Smoking Status**



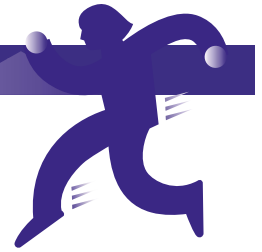
Source: Public Health Institute, 2000

## Healthy Eating and Tobacco Use

Smokers scored only 2.4 of a possible 7 points for Healthy Eating Practices, compared 3.2 for non-smokers. This was by far the biggest difference seen among any of the demographic segments, including between boys and girls, younger and older youngsters, the four ethnic groups, active and inactive teens, and by weight status. Where did these differences come from?

Significant differences were observed among smokers and non-smokers for fruit and vegetable consumption. Smokers were much less likely to eat fruits and vegetables than non-smokers, 3.2 and 4.4 servings, a difference of more than a whole serving. More than half of adolescent smokers ate 2 or fewer servings of fruits and vegetables a day compared to three in ten of non-smokers, an amount that in epidemiological studies doubles the risk of cancer compared to eating 5 or more servings.

Smokers were much more likely not to eat whole grain breads, tortillas or cereal. Adolescents who smoked were much less likely to drink nonfat or 1% fat milk than non-smokers. Smokers were the most likely to have no milk or dairy desserts, although their reported intake of cheese and yogurt was similar to that of non-smokers.



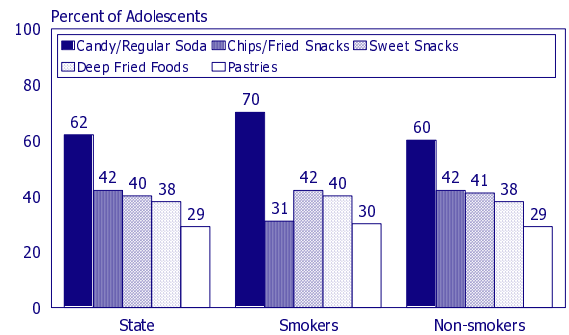
## Less Healthy Eating Practices

Teen smokers reported higher consumption of candy and sugared sodas. Reported intake of bakery desserts, deep-fried foods, and breakfast pastries was the same as that of other adolescents, while intake of chips and frozen dairy desserts was lower. There were no differences found in the likelihood of eating multiple servings of low nutrient foods between smokers and non-smokers.

## Out-of-Home Eating

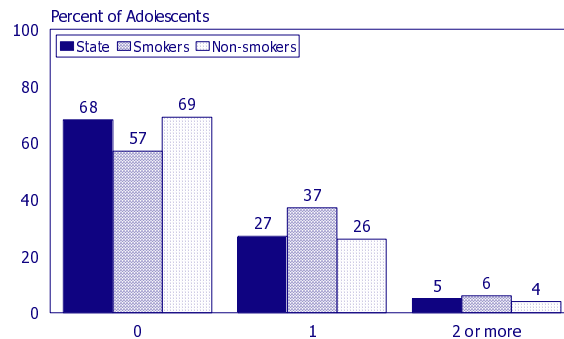
Adolescents who smoked were more likely to have eaten at a fast food restaurant on the previous day than were non-smokers. Over 40 percent of smokers ate at a fast food restaurant, compared to 30 percent of non-smokers.

**Figure 13: Consumption of High Fat, Low Nutrient Foods by California Adolescents, 1998 by Smoking Status**



Source: Public Health Institute, 2000

**Figure 14: Times Yesterday That California Adolescents Ate at a Fast Food Restaurant, 1998 by Smoking Status**



Source: Public Health Institute, 2000

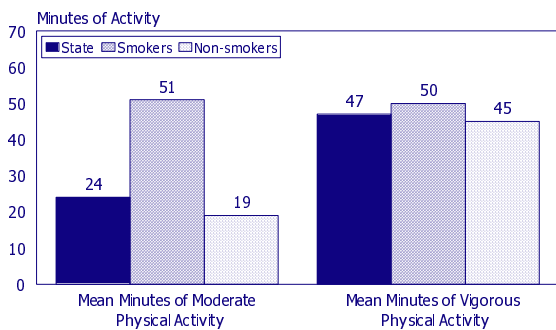


## Overweight and Hunger

Smokers were less likely to be overweight than non-smokers, but they were more likely to be at risk of overweight.

About twice as many smokers as non-smokers reported ever going hungry because there was not enough money to buy food for the house.

**Figure 15: California Adolescents' Involvement in Moderate and Vigorous Physical Activity, 1998 by Smoking Status**

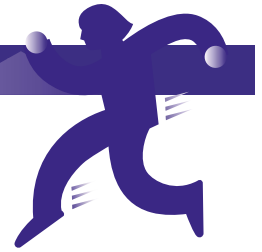


Source: Public Health Institute, 2000

## Physical Activity

Adolescents who smoked reported significantly more moderate activity and similar amounts of vigorous activity than did non-smokers. Combining the two types of activity, smokers got about 100 minutes of total physical activity and non-smokers got slightly over 60 minutes of total physical activity.

There was no significant difference between the two groups in the likelihood of getting the recommended hour or more of vigorous activity. Non-smokers reported taking more physical education classes than smokers, and they were much more likely to report involvement in organized sports. There were no differences reported between smokers and non-smokers in the amount of time spent watching television or using computers for homework.



## Educational and Environmental Factors

The *California Teen Eating, Exercise, and Nutrition Survey (CaITEENS)* explored other factors that influence behavior at the individual and interpersonal level. Behavior-specific attitudes that correlate with good eating in adults, such as believing that 5 daily servings of fruits and vegetables are needed for good health, were highly correlated in adolescents for virtually all food groups. Other factors such as being reinforced for positive behavior, bonding with others, having specific skills, and believing that they could eat in a certain way also were positively associated with fruit and vegetable consumption and overall healthy eating.

*Reinforcement* in the forms of guilt, reward or praise may modify the chance of repeating or maintaining a behavior. One-third of all adolescents reported that they felt bad about themselves when they did not eat healthy. Adolescents who said they “felt bad” if they didn’t “eat healthy” reported an average of 4.7 servings of fruits and vegetables and a 3.4 Healthy Eating Practices Score. This was significantly higher than the 4.1 servings of fruits and vegetables and the 3.0 Healthy Eating Practices Score reported by adolescents who did not feel bad.

Almost three in five adolescents reported that their parents noticed if they had not eaten healthy foods. They ate significantly more fruits and vegetables and had a higher Healthy Eating Practices score than adolescents who did not think their parents noticed.

**Table 5: Correlation Between Reinforcement and Healthy Eating among California Adolescents 1998**

Behavioral Construct		Mean Servings of Fruits and Vegetables	Healthy Eating Practices Score
Feel bad on days when you haven't eaten healthy	yes	4.7 ***	3.4 ***
	no	4.1	3.0
Parents notice when you haven't eaten healthy	yes	4.6 ***	3.4 ***
	no	3.8	2.9

\*\*\* p<.001  
Source: Public Health Institute, 2000



**Table 6: Correlation Between Gardening and Healthy Eating among California Adolescents 1998**

Behavioral Construct		Mean Servings of Fruits and Vegetables	Healthy Eating Practices Score
Ever worked in a garden to grow fruits and vegetables	yes	4.7 ***	3.5 ***
	no	4.0	2.9

\*\*\* p<.001  
Source: Public Health Institute, 2000

Positively interacting with one’s *environment* affects behavior, and gardening has been proposed as a way of affecting healthy eating.

The mean fruit and vegetable consumption of adolescents who had worked in a garden was 4.7 servings, compared to 4.0 servings for those who had not. The Healthy Eating Practices Score was 3.5 for gardeners and 2.9 for non-gardeners, compared to the state average of 3.1 out of 7 points. Gardening was reported the most often by white adolescents, by 12-13 year olds, by those not at risk for overweight, and by those engaging in regular physical activity. Nearly half of all adolescents reported ever working in a garden to grow fruits or vegetables.

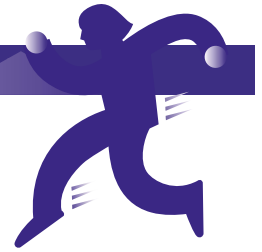
Almost nine out of ten adolescents reported that fruits, vegetables, or juices were available when they were hungry, and there were no differences among the demographic segments. However, those for whom this was not true reported significantly fewer healthy eating practices.

**Table 7: Correlation Between Self-Efficacy and Healthy Eating among California Adolescents 1998**

Behavioral Construct		Mean Servings of Fruits and Vegetables	Healthy Eating Practices Score
Can find healthy foods at home	yes	4.3 ***	3.2 ***
	no	2.2	2.1
I can eat more fruits and vegetables	yes	4.3 ***	3.2
	no	5.3	3.5

\*\*\* p<.001  
Source: Public Health Institute, 2000

The adolescents who reported that they could find healthy foods at home reported having 4.3 servings of fruits and vegetables per day and a Healthy Eating Practices Score of 3.2. The adolescents who did not think they could find healthy foods at home ate significantly fewer, only 2.2 servings of fruits and vegetables, and scored only 2.0 out of a possible 7 points for Healthy Eating Practices.



## Knowledge and Skills

Adolescents who thought they could choose healthy foods from menus ate more fruits and vegetables and reported more healthy eating practices than those who did not report having this skill.

Adolescents who said that they had been taught to cook in healthy ways also ate better. Girls, especially those in the 12-13 year old group, African-Americans, regular exercisers, and adolescents at risk for overweight more frequently reported having skills in healthy cooking.

## Predictors of Physical Activity

The influences on physical activity that were examined in this survey did not correlate as well with reported behavior as the diet-related factors did. Exercising with friends, believing in one’s own ability to engage in “hard exercise”, and having taken a class on the health benefits of physical activity were the only factors that correlated with more minutes of physical activity.

Three in five adolescents reported having taken a class on the health benefits of exercise during the past year, and those who had taken such a class reported that they were active significantly more days per week for longer duration. About the same percent had taken a class on the health benefits of good nutrition, but no significant differences were seen in their exercise practices.

## Academic Performance

Self-rated academic performance was consistently and positively related to healthy behaviors. Those who felt that their school performance was “better” or “much better” than average scored as much as 30 percent higher on Healthy Eating Practices and were less than half as likely to be smokers than teens who reported they were “average” or “below average” students. Higher performers also were more likely to report having taken a class on the health benefits of physical activity.

**Table 8: Correlation Between Behavioral Capability and Healthy Eating among California Adolescents 1998**

Behavioral Construct		Mean Servings of Fruits and Vegetables	Healthy Eating Practices Score
Know how to pick healthy food from a menu	yes	4.4 ***	3.3 ***
	no	3.6	2.7
Taught to cook in a healthy way	yes	4.5 ***	3.3 ***
	no	3.8	2.9

\*\*\* p<.001  
Source: Public Health Institute, 2000



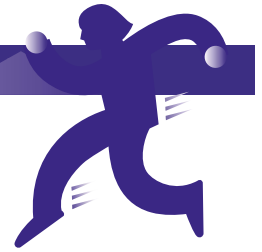
## Comparison with California Adults

While adults serve as role models and are responsible for providing a safe, healthy environment that helps children succeed in life, the developmental task of adolescence is to assume more independence and begin establishing one's adult identity. Compared to adults taking part in the *California Dietary Practices Survey*, adolescents were more likely to report meeting the healthy eating goals:

- For fruit and juice, but not for salads and vegetables;
- For whole grain breads, but not for higher fiber cereals;
- For drinking milk, but not for 1% or less fat types; and
- For eating beans, but not for keeping intake of high calorie, low nutrient foods moderate.

Adolescents were about twice as likely to eat deep fat fried foods, chips, and breakfast pastries as adults were, and they choose fast food about 50 percent more than adults did. As might be expected, rates of unhealthy weight were about half that of adults, as were rates of physical inactivity.

In short, adolescents were likely to be eating more food than adults were but, within each food group, they generally reported fewer healthy choices and more that were harmful. In both adults and teens, rates of poor diet, unhealthy weight and physical inactivity greatly exceeded the Nation's goals for disease prevention.



## Recommendations

Many experts have called for population-wide efforts in nutrition, physical activity and obesity prevention like those proved successful in tobacco control. This is because the dimensions of the problem and the subsequent health impact of poor diet/physical inactivity are so similar to those of tobacco use. New information from the *California Teen Eating, Exercise and Nutrition Survey (CaTEENS)* supports the following policy measures to reverse what appear to be deteriorating health conditions for adolescents in California:

**1. Increase public awareness about the extent and causes of poor eating and exercise habits in adolescents and adults, the apparently increasing rates and patterns of overweight in teens, and the serious health, educational, and economic implications for adolescents.**

- A public awareness initiative is needed to advise parents and other adults that work with young people about the eating, exercise and weight problems being experienced by adolescents, the environmental and social contributors, and the serious consequences of leaving the problems unattended.
- Public awareness should also be increased about practical preventive measures starting in early childhood through adolescence, including restoration of the proper parent-child feeding relationship, simple techniques such as limiting television time, and fostering a physically active family life.
- Continued research is needed to understand the social, educational, and economic implications of not correcting poor eating and exercise problems and to identify priorities for action.

**2. Communicate to parents, educators, health professionals, and other adults who work with adolescents the population-based environmental and policy strategies available to promote healthy eating and exercise, and slow or reverse rates of overweight so that they can incorporate appropriate measures in their own settings.**

- Initiatives designed by and for different adolescent segments are needed and should be tailored by age, culture or ethnicity, and lifestyle.
- Build on and expand California's existing theory-driven intervention campaigns that aim to promote healthy eating and physical activity and prevent obesity such as: *Food on the Run* (Department of Health Services), *Shaping Health as Partners in Education, California* (California Department of Education), *Children and Adolescent Nutrition and Fitness project* (non-profit), *Sports, Play, and Active Recreation for Kids* (San Diego State University), *Middle School Physical Activity and Nutrition study* (University of California, San Diego) the *Stanford Adolescent Heart Health Program* (Stanford University), *Grassroots Child/Adolescent Nutrition and Fitness Campaign* (Southern California Public Health Association), and industry programs such as that of the Dairy Council of California.



- School nutrition and physical activity programs should be strengthened to include sustainable initiatives for lifestyle-oriented, “new” physical education in grades 9<sup>th</sup> through 12<sup>th</sup>; support teachers in offering students empowering, practical skill-building nutrition education; and use the purchasing power of schools to motivate the development of new and appealing “healthy fast foods.”
  - Schools and after school programs should be encouraged to maximize participation in all U.S. Department of Agriculture (USDA) Child Nutrition Programs, including school breakfast.
  - Introduce structural changes to strengthen school nutrition programs so that more students will participate and benefit from them. Employ a range of strategies to merchandise and promote healthy foods for school breakfast, lunch, a la carte, and vending operations: create economic incentives to build student demand by subsidizing healthier foods and charging more for those that provide little more than calories; and experiment with ways to increase student and staff participation in on-site dining as a means of building school community.
  - During school construction and renovation, upgrade the recreational facilities for students and share them with the community, improve the ambiance and efficiency of student and staff dining facilities, and provide modern food preparation facilities for staff.
- 3. Set reasonable expectations for slowing or reversing the rise in rates of and risks from obesity. Proceed with caution when implementing health promotion programs and policies to avoid stigmatizing at risk and overweight adolescents, and put measures in place to prevent or eliminate size discrimination.**
- Provide training to health and education workers, as well as to adolescents themselves, to become aware of ways in which overweight adolescents might be left out, disadvantaged or stigmatized. In view of the documented negative effect of obesity on future socioeconomic status, pay special attention to ways that might affect an adolescent’s performance in class, on tests and in other competitive situations, including admission to college.
  - Encourage school districts and community youth organizations to examine the inclusivity of their programming for overweight and obese adolescents.



**4. Promote leadership from the food and fitness industries, as well as other businesses that market to adolescents to modify the design and marketing of products that have a negative impact on dietary quality, physical activity, body image, and overall health attitudes and beliefs.**

- Call upon businesses to examine their own marketing practices to assure that they are not inadvertently promoting poor eating and exercise habits in teens.
- Urge the food industry to re-engineer and market a wider range of appealing “fast foods”—especially vegetables— aimed at teens.
- Encourage the fitness industry to expand marketing to adolescents for fun, lifestyle-oriented fitness activities and the “gear” that goes with them.

**5. A coordinated state-national response also should be organized by units of the Federal Government, with the Centers for Disease Control and Prevention continuing its active leadership role. Similar to the early stages of other epidemics, an action-oriented grants program conducted in partnership with states and other national leadership organizations should be initiated.**

- CDC should continue its leadership by monitoring and publicizing trends, characterizing the magnitude and scope of the problem, conducting applied research, and communicating solutions nationally and to states and establish a new cooperative program with states.
- Develop comprehensive approaches by USDA to strategically mobilize its resources such as nutrition monitoring, nutrition education, and economic research in partnership with states that include a seamless transition among school-based and community nutrition programs.
- Develop and make available through the National Cancer Institute’s *National 5 A Day Program* a full portfolio of policy, school- and community-based interventions for adolescents.
- Find innovative ways of empowering teens and communities outside the school environment through increased collaboration between state and federal agencies and civic, service, and nonprofit organizations that reach adolescents, such as 100 Black Men, Inc., the *California Adolescent Nutrition and Fitness Project*, and business organizations like local chambers of commerce.



## Limitations of the Research and of This Report

*CalTEENS* relied upon self-reported information that is dependent on the respondent's awareness and recall of their previous day's diet and physical activity. As a single day of information, the responses do not necessarily reflect an individual's habits, but when aggregated, the prevalence of behavioral patterns for a population can be discerned. This first survey cannot assess trends, nor are the methods necessarily comparable with other studies, so comparisons with other research are made in general terms.

The sample was weighted to match the 1990 Census, so demographic shifts during the 1990's are not reflected. There has been a relative increase in the proportion of adolescents who are non-white, so tabulations by ethnicity in this report include a higher proportion of white and a lower proportion of adolescents of color than are currently in the California population.

Although the survey questions have not yet been validated with adolescents, there is evidence that the interview methods provide valid information. For example, adolescents have been shown to be reliable respondents in dietary surveys. Further, although simplified 24-hour recall methods like those used in *CalTEENS* have been found to underestimate the intake of staples like white bread or meat, they appear fairly accurate for the food groups of greatest concern—fruits, vegetables and milk products. For physical activity, survey methods that query for specific types and duration of activity appear to have good validity.

That said, people reporting by phone tend to think they are slightly taller and lighter than if they are measured in person, and overweight adolescents may slightly inflate height and deflate weight. Therefore, this survey may under-estimate rates of at-risk for overweight and overweight.

The survey was conducted from February to April, so it reflects seasonal choices of fruits, vegetables, and physical activity. Similarly, rates of tobacco use reported by the high school-aged groups are likely to be higher in *CalTEENS* than in a year-round survey like the *California Youth Tobacco Survey* because uptake increases during the school year. Finally, no information was collected about the socioeconomic status of the child or his/her family. In adults, higher socioeconomic status, especially years of education, is highly correlated with positive health habits.

In this report, statistical differences were mentioned only if they were detected at the level of  $p$  less than or equal to .05. The values on figures and tables were noted by asterisks ( $p < .05 = *$ ,  $p < .01 = **$ ,  $p < .001 = ***$ ). If means were statistically significant, follow-up tests were conducted to assess differences among the groups. For most tabulations, the margin of error is  $\pm 3$  percentage points.

These **Media Highlights** were excerpted from a complete technical report that includes extensive data tables and bibliographic citations. The interested reader is referred to the complete report that is available from either the Public Health Institute or the Cancer Prevention and Nutrition Section.