

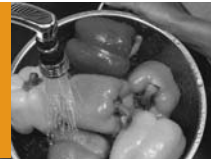


Child and Youth Fact Sheet

Steps to Enhance Consumption and Accessibility to Fruits and Vegetables

The Obesity Epidemic:

- Thirteen percent of Maine high school students are overweight and 15% are at risk for becoming overweight.
Reference: Maine Youth Risk Behavior Survey, Maine Department of Education, 2003.
- Thirteen percent of Maine middle school students are overweight and 18% are at risk for becoming overweight.
Reference: Maine Youth Risk Behavior Survey, Maine Department of Education, 2003.
- Fifteen percent of Maine kindergarten students are overweight and 21% are at risk for becoming overweight.
Reference: Maine Child Health Survey, Maine Department of Health and Human Services, 2002.
- During the past two decades, the percentage of children who are overweight has nearly doubled and the percentage of adolescents who are overweight has almost tripled in the U.S.
Reference: National Center for Health Statistics, Centers for Disease Control and Prevention. Prevalence of overweight among children and adolescents: United States, 1999 [Internet]. [Hyattsville (MD)]: NCHS [cited 2001 Oct 31]. Available from: www.cdc.gov/nchs/products/pubs/pubd/hestats/over99fig1.htm
- Overweight children have an increased risk of high blood pressure, high cholesterol levels, Type 2 diabetes, early heart disease, and becoming obese adults.
Reference: Dietz, WH. Health consequences of obesity in youth: Childhood predictors of adult disease. *Pediatrics*. March 1998;101(3) Suppl:518-525.
- In the United States over the past twenty years, obesity-associated annual hospital costs for youth aged 6 to 17 years have increased more than threefold, from \$35 million in 1979-1981 to \$127 million in 1997-1999.
Reference: Wang, G.; Dietz, W., Economic burden of obesity in youths aged 6 to 17 years: 1979-1999, *Pediatrics*. May 2002; 109(5): e81. Available from: <http://www.pediatrics.org/cgi/content/full/109/5/e81>
- Studies have linked high consumption of energy-dense snacks, fast foods, and soft drinks with rising obesity rates both in the United States and worldwide.
Reference: Drwenowski, A, Barratt-Fornell, A., Do Healthier Diets Cost More?, *Nutrition Today*. 2004; 39: 161-168.



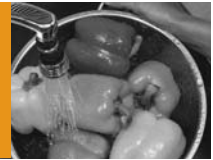
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Health Benefits of Eating Fruits and Vegetables:

- There is emerging evidence that the quality of dietary intake of youth, particularly increased intake of fruits in childhood, may be associated with reduced cancer risk in adulthood.
Reference: Maynard, M., et al, Fruit, vegetables, and antioxidants in childhood and risk of adult cancer: The Boyd Orr cohort, *Journal of Epidemiology and Community Health*. 2003; 57:218-225.
- Major benefits of healthful eating from kids' perspectives included improvements to cognitive and physical performance, fitness, endurance, psychological benefits, physical sensation, and production of energy.
Reference: O'Dea, J., Why do kids eat healthful food? Perceived benefits of and barriers to healthful eating and physical activity among children and adolescents, *Journal of the American Dietetic Association*. April, 2003; 103:4: 497-500.
- High fruit and vegetable intakes have beneficial effects on the bone area of the radius and whole body in early pubertal girls. The lower urinary calcium output associated with higher fruit and vegetable intakes may be a modulating factor.
Reference: Tylavsky, F.A., Holiday, K., Danish, R., Womack, C., et al, Fruit and Vegetable Intakes are an independent predictor of bone size in early pubertal children, *The American Journal of Clinical Nutrition*. February 2004; 79:2: 311.

Current Statistics on Fruit and Vegetable Consumption by Youths:

- Seventy-seven percent of Maine high school students do not eat the recommended five servings of fruits and vegetables each day.
Reference: Maine Youth Risk Behavior Survey, 2003.
- Just over half (51%) of school-aged children eat less than one serving of fruit a day and 29% eat less than one serving a day of vegetables that are not fried.
Reference: Position of the American Dietetic Association, Society for Nutrition Education and American School Food Service Association: Nutrition Services: An essential component of a comprehensive school health programs, *Journal of the American Dietetic Association*. April, 2003; 103: 4: 505-514.

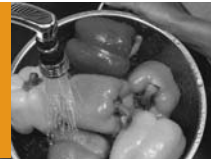


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Eating Behaviors in Relation to Fruit and Vegetable Intake:

Family Influences:

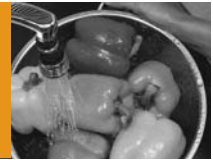
- Parental consumption, breastfeeding, and early introduction to fruits and vegetables were related to the intake of both fruits and vegetables.
 Reference: Cooke, L.J., et al, Demographic, familial and trait predictors of fruit and vegetable consumption by pre-school children, *Public Health Nutrition*. April 1, 2004; 7:2: 295-303.
- Parents appear to moderately influence middle school student fruit and vegetable consumption. Educators might focus on improving home fruit and vegetable availability and student self-efficacy as well as parent support and modeling.
 Reference: Young, E.M., Fors, S.W., Hayes, D.M., Associations between perceived parent behaviors and middle school student fruit and vegetable consumption, *Journal of Nutrition Education and Behavior*. January/February 2004; 36:1:2.
- The oldest adolescents reported lower self-efficacy, peer modeling, family dinner frequency and fruit and vegetable preferences compared with younger adolescents. White participants and females reported a higher preference for vegetables than did black participants and males. Preferences for vegetables and parental modeling were the strongest correlates of self-efficacy. Self-efficacy was the strongest correlate of snack choice.
 Reference: Granner, M.L., Sargent, R.G., Calderon, K.S., Hussey, J.R., Factors of fruit and vegetable intake by race, gender, and age among young adolescents, *Journal of Nutrition Education and Behavior*. July/August 2004; 36:4.
- Family meals appear to play an important role in promoting positive dietary intake among adolescents. Frequency of family meals was positively associated with intake of fruits, vegetables, grains, and calcium-rich foods and negatively associated with soft drink consumption. Positive associations were also seen between frequency of family meals and energy; protein; calcium; iron; folate; fiber; and Vitamins A, C, E, and B-6.
 Reference: Newmark-Sztainer, D., et al, Family meal patterns: Associations with sociodemographic characteristics and improved dietary intake among adolescents, *Journal of the American Dietetic Association*. March, 2003; 103:317-322.
- Authors of this study concluded that television viewing is inversely associated with intake of fruit and vegetables among adolescents. These associations may be a result of the replacement of fruits and vegetables in youths' diets by foods highly advertised on television.
 Reference: Boynton-Jarrett, R., Thomas, T.N., Peterson, K.E., Wiecha, J., et al, Impact of Television Viewing Patterns on Fruit and Vegetable Consumption Among Adolescents, *Pediatrics*. December 2003; 112: 6: Part 1: 1321.
- A higher frequency of television viewing during dinner was associated with lower fruit and vegetable consumption and higher fat consumption. Planning meals in advance was associated with higher fruit and vegetable consumption; however 46% of the adults did not plan meals in advance.
 Reference: Boutelle, K.N., et al, Associations between perceived family environment and parent intake of fruit, vegetables, and fat, *Journal of Nutrition Education and Behavior*. January/February 2003; 35:1: 24.



Child and Youth Fact Sheet (continued)

Role of the School Environment:

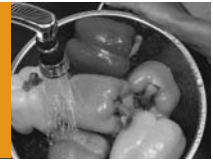
- Research shows that State health agency-initiated school-based interventions can be comparatively successful in changing youth dietary behavior.
Reference: Staples, G.J., et al, Small School-Based Effectiveness Trials Increase Vegetable and Fruit Consumption Among Youth, *Journal of the American Dietetic Association*. February 2005; 105:2:252-256.
- Verbal encouragement by food service staff was associated with increased total fruit intake. The outcomes of this study suggest that multi-component interventions which include classroom activities and reinforcement in the curriculum are more powerful than cafeteria programs alone with first and third grade students.
Reference: Perry, C.L., Bishop, D.B., Taylor, G. L., Davis, M., et al, A randomized school trial of environmental strategies to encourage fruit and vegetable consumption among children, *Health Education and Behavior*. February 2004; 31:1: 65.
- Middle school students who gained access to school snack bars consumed fewer healthy foods compared with the previous school year, when they were in elementary schools and only had access to lunch meals served at school. Healthy food choices and school policies that require healthier foods at school snack bars, including fruits and vegetables, should be promoted.
Reference: Weber-Cullen, K., Zakeri, I., Fruits, Vegetables, Milk, and Sweetened Beverages Consumption and Access to a la carte/snack bar meals at School, *American Journal of Public Health*. March 2004; 94: 3: 463-468.
- Schools play a critical role in producing healthy students who are better able to develop and learn by establishing an environment that supports a nutritious diet.
Reference: U.S. Department of Health and Human Services, Healthy People 2010. 2nd ed. Washington, D.C.:U.S.Government Printing Office. November 2000.
- Children who drink the highest amounts of sweetened beverages also consume more high-fat vegetables such as french fries, and 57-62% less fruits.
Reference: Cullen, K.; et al. Intake of soft drinks, fruit-flavored beverages, and fruits and vegetables by children in grades 4 through 6. *American Journal of Public Health*. 2002; 92(9):1475-1478.



Child and Youth Fact Sheet (continued)

Barriers to Consuming Vegetables and Fruits

- Barriers of healthful eating from kids' perspectives included convenience, taste, and social factors. Reference: O'Dea, J., Why do kids eat healthful food? Perceived benefits of and barriers to healthful eating and physical activity among children and adolescents, *Journal of the American Dietetic Association*. April, 2003; 103:4: 497-500.
- Children in this study sample reported that they were not encouraged to eat fruit or vegetables by their peers, nor did they expect that consuming these items on a daily basis would make them more physically attractive or popular. In accordance with other studies, the peer discouragement-encouragement scale on fruit, juice, and vegetables skews toward the discouragement end. Reference: Vereecken, C.A., et al, Measuring Attitudes, Self-Efficacy, and Social and Environmental Influences on Fruit and Vegetable Consumption of 11- and 12-Year-Old Children: Reliability and Validity. *Journal of the American Dietetic Association*. February 2005; 105:2: 257-261.
- Fruit, fruit juice, and vegetable availability were the only significant predictors, whereas both availability and accessibility were significantly related to consumption for children with low fruit, fruit juice, and vegetable preferences. Interventions targeting child dietary behaviors may need to tailor to the home environment, separately by gender. Extra efforts are necessary by parents to enhance accessibility among children who do not like fruit, fruit juices, and vegetables. Reference: Weber Cullen, K., Baranowski, T., Owens, E., Marsh, T., et al, Availability, accessibility, and preferences for fruit, 100% fruit juice, and vegetables influence children's dietary behavior, *Health Education and Behavior*. October 2003; 30: 5; 615.
- Subjective norms, barriers, knowledge, usual food choice, parenting style, spirituality/religiosity, and depressive symptoms were statistically significant predictors of intake of fruits and vegetables. Reference: Lytle, L.A., Varnell, S., Murray, D.M. Story, M., et al, Predicting adolescents' intake of fruits and vegetables, *Journal of Nutrition Education and Behavior*. July/August 2003; 35:4:170.
- The dietary patterns of young adults, often influenced by breakfast-skipping, fast food consumption, and weight satisfaction issues are barriers to adequate fruit and vegetable intakes. The perceived benefits of eating fruits and vegetables significantly increased as subjects committed to improving their intake of fruits and vegetables. Reference: Horacek, T.M., White, A., Betts, N.M., Hoerr, S. et al, Self-efficacy, perceived benefits, and weight satisfaction among stages of change for fruit and vegetable intakes for young men and women, *Journal of the American Dietetic Association*. October 2002; 10:1466-71.



Child and Youth Fact Sheet (continued)

Current Recommendations for Fruit & Vegetable Consumption:

- The sixth edition of the *Dietary Guidelines for Americans* advise individuals to consume a sufficient amount of fruits and vegetables while staying within energy needs. Two cups of fruit and two and one half cups of vegetables per day are recommended for a reference 2,000 calorie intake, with higher or lower amounts recommended, depending upon daily total calorie level.
Reference: Dietary Guidelines for Americans, 2005, U.S. Department of Health and Human Services, U.S. Department of Agriculture, HHS Publication Number:HHS-ODPHP-2005-DGA-A.
- Goals for Healthy People 2010 aim for 50% of the population (two years and older) to eat a minimum of three servings of vegetables daily with one-third or more of those servings coming from dark leafy green or orange vegetable sources.
Reference: U.S. Department of Health and Human Services, Healthy People 2010. 2nd edition. Washington, D.C.: U.S. Government Printing Office, November 2000.
- The DASH dietary pattern recommends four to five servings of fruits and four to five servings of vegetables. Vegetables, in addition to being a good source of fiber; Vitamins A, C, E; and folate also contributed an average of 15% to the intakes of magnesium, potassium, and calcium in the DASH Diet.
Reference: HWA Lin et al., Food Group Sources of Nutrients in the Dietary Patterns of The DASH-Sodium Trial, PAO-*Journal of the American Dietetic Association*. 2003; 103: 488-496.

