Re-think Your Drink

SCHOOL-AGE CHILDREN & YOUTH:

Trends, Effects, Solutions

Eating smart and moving more are the cornerstone of a healthy lifestyle and provide a solid foundation for children and youth to succeed in school and in life.

There are many health benefits associated with good nutrition and physical activity. Eating smart and moving more help children and youth maintain a healthy weight, feel better and have more energy. These positive health benefits have the potential to translate into academic benefits at school. Good nutrition and physical activity nourish the brain and body, resulting in students who are present, on-time, attentive in class, on-task and possibly earning better grades.

As students work hard to achieve high academic standards, it is more important than ever that we provide opportunities for them to be active and eat healthy throughout the day. Families, schools and communities must share the responsibility of promoting and supporting children and youth to eat smart and move more.

Research points to seven key behaviors that can help children, youth and adults eat healthier and be more active:

1. Prepare and eat more meals at home
2. Tame the tube
3. Choose to move more every day
4. Right-size your portions
5. Re-think your drink
6. Enjoy more fruits and veggies
7. Breastfeed your baby

This paper will explore trends in and effects of shifts in drink consumption. It will also offer solutions for schools, government, communities and families to support children and youth in re-thinking their drink choices.

Trends in Drink Consumption

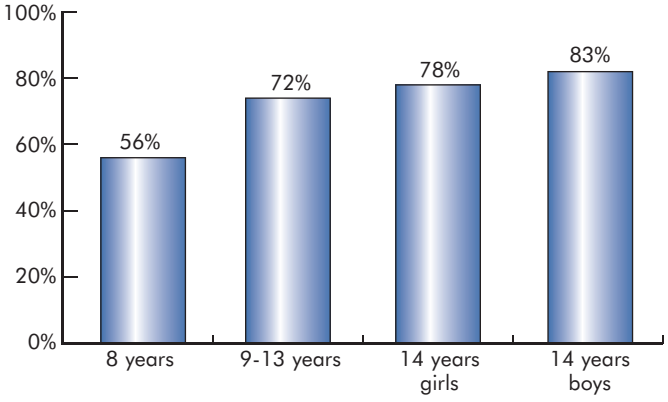
Americans are drinking more soft drinks and other sweetened beverages and less milk.[1] The most popular American beverage is the carbonated soft drink, which accounts for 28 percent of total beverage consumption. That is more than twice next-closest, non-alcoholic beverage, milk, at about 11 percent.[2]

According to the United States Department of Agriculture (USDA), per capita soft-drink consumption has increased almost 500 percent over the past 50 years.[4] One reason for the steady rise in soft drink consumption is growing container sizes. In the 1950s, a 6 1/2-ounce bottle was standard. In the 1960s, it was a 12-ounce can, and today the 20-ounce bottle is most common. Fountain drinks can range in size from 22 to 64 ounces.[5]

Soda is the most common soft drink.[6] The term soda includes carbonated beverages containing artificial or natural sweeteners.[7] Enough regular soda is produced to supply every American with more than 14 ounces of soda every day.[6] Children start drinking soda at a remarkably young age and consumption increases through young adulthood.[5,8] More than half (56 percent) of 8-year-olds drink soft drinks daily.[9] Most adolescents (65 percent of girls and 74 percent of boys), drink soft drinks daily[10]—most of which are sugar-sweetened.[11]

Soft drinks are defined as any non-alcoholic beverage containing natural or artificial sweeteners. Examples include soda, sweet tea, lemonade, fruit drinks (containing less than 50 percent juice), energy drinks and sports drinks. Milk or milk products, soy, rice or similar milk substitutes, and fruit products with 50 percent or more juice, are not considered soft drinks.[3]

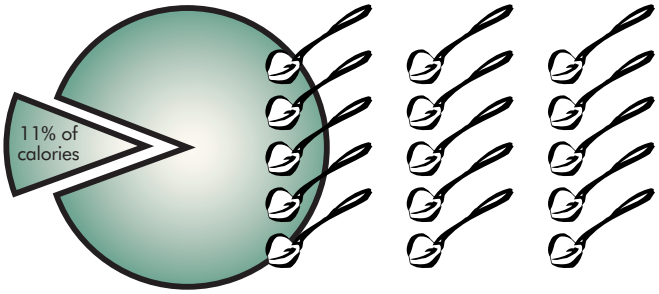
Percent of Children Drinking Soft Drinks Daily[9]



Effects of Shifting Drink Consumption

People who drink soft drinks take in more calories than those who do not.[7] Sugar supplies the calories in soft drinks. Non-diet soft drinks account for almost half (46 percent) of total sugar in the diet.[12] Sweetened drinks are the primary source of added sugar for children and youth.[13] On average, adolescents get 15 teaspoons of sugar from soft drinks daily.[5]

Soft Drink Contribution to Diets of Adolescents[14]



This high consumption of sugar is contrary to the Dietary Guidelines for Americans 2005.[15] Intake of sugar-sweetened beverages has been associated with weight gain, overweight, obesity and type 2 diabetes.[7,16] Between 1970 and 1997, yearly per capita consumption of non-diet soft drinks rose 86 percent in the United States.[17] Intake of high fructose corn syrup, the primary sweetener for soft drinks, increased 1,000 percent between 1970 and 1990.[18] The prevalence of obesity increased 112 percent during that same time.[19]

A 12-ounce can of soda has 150 calories and 10 teaspoons of sugar in the form of high fructose corn syrup. If these calories are added to the typical diet without cutting back on something else, one soda a day could lead to a weight gain of 15 pounds in one

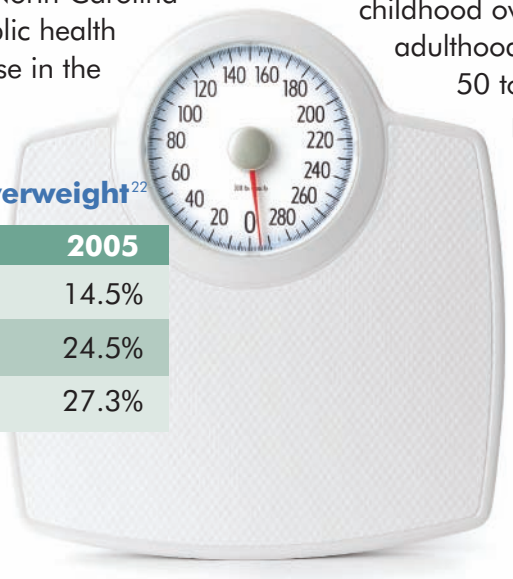
Overweight in Children and Youth

According to the 2001 Surgeon General's *Call to Action to Prevent and Decrease Obesity*, today there are nearly twice as many overweight children and almost three times as many overweight adolescents as there were in 1980.[20] Results from the 2003-04 National Health and Nutrition Examination Survey (NHANES), using Body Mass Index (BMI), indicate that an estimated 13.9 percent of children ages 2-5 years, 18.8 percent of children ages 6-11 years, and 17.4 percent of adolescents ages 12-19 years are overweight.[21] North Carolina 2005 data from children seen in public health settings show an even greater increase in the number of overweight children.[22]

Percent of North Carolina Children and Youth Who Are Overweight[22]

	1995	2000	2005
Ages 2-4	9.0%	12.2%	14.5%
Ages 5-11	14.7%	20.6%	24.5%
Ages 12-18	22.7%	26.0%	27.3%

BMI, an index of a person's weight in relation to height, is commonly used to classify overweight and obesity among adults and is also recommended to identify children who are overweight or at risk of becoming overweight. Children with a BMI ≥ 85th percentile but <95th percentile are overweight (formerly considered at risk for being overweight) and children with a BMI ≥ 95th percentile are obese (formerly considered overweight).[23]



Studies have indicated that overweight children (especially adolescents) are at higher risk of becoming obese adults.[24] The likelihood that childhood overweight will persist into adulthood ranges from approximately 50 to 70 percent, increasing to 80 percent if one parent is overweight.[25,26] Obesity is no longer a concern for adults only. Signs of chronic disease associated with obesity are showing up in overweight children. These include atherosclerotic plaques,[27] hypertension,[28,29,30] increased triglycerides,[28,30] increased insulin resistance and type 2 diabetes.[27,31]

Sugars are found naturally in foods, such as fructose in fruit or juice, or lactose in milk. They are also added to food. Added sugars, known as caloric sweeteners, are added to foods at the table or during processing or preparation. They provide calories but few or no nutrients. Some of the names for added sugars are listed below:

Brown sugar • Honey • Corn sweetener
Sucrose • Invert sugar • Sugar • Dextrose
Lactose • Syrup • Malt syrup • Glucose
Molasses • Fruit juice concentrates • Maltose
High fructose corn syrup • Raw sugar

year.[32] A recent study of 12-year-olds found that for each additional sugar-sweetened drink consumed daily, both BMI and frequency of overweight increased by 60 percent after adjustment for anthropometric, demographic, dietary and lifestyle variables.[33]

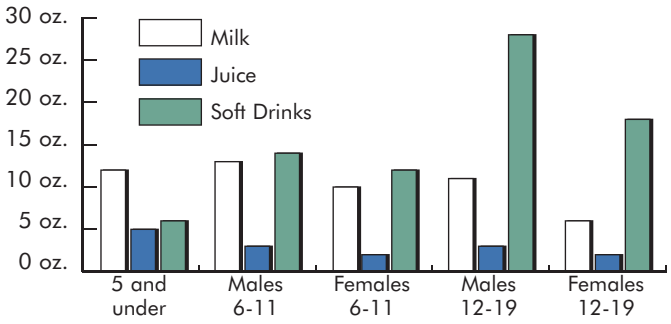
High fructose corn syrup (HFCS) is a sweetener developed from processing corn. HFCS was added to many processed foods (breads, cereals, condiments, etc.) and soft drinks in the United States between 1975 and 1985. Since then, HFCS has begun to replace sugar in various processed foods in the U.S. For manufacturers, HFCS is somewhat cheaper to use.

Not only are soft drinks adding major amounts of calories and sugar to the diets of children and adolescents, they are also replacing milk and other more nutritious beverages.[11] In fact, teenage boys and girls are drinking twice as much soda as milk.[5]

When children and adolescents replace low-fat milk and 100 percent fruit or vegetable juice with soft drinks, they lose out on valuable nutrients, like protein, calcium and vitamins, needed for normal growth and development. Only three in ten (36 percent) boys and less than two in ten (14 percent) girls are getting enough calcium. Teens who consume more soft drinks also get less magnesium, vitamin A, vitamin C and riboflavin, and more calories, fat and carbohydrates.[5] Too many soft drinks also increase the risk of dental caries and potential tooth enamel erosion.[33]

Beverage Consumption of Children and Adolescents in the U.S.

(Average quantities [in ounces] per day)[14]



Sports drinks, another popular soft drink, are intended to keep people hydrated and supplied with energy when doing high intensity, aerobic exercise for at least 90 minutes. Most kids these days are active for less time and intensity. The added sugar and sodium in sports drinks are unnecessary for children and youth.[7] Sports drinks offer little advantage over water for kids.

Nutrient Composition of Beverages[34]

Beverages	Calories (kcal)	Added sugar (g)	Total Fat (g)	Calcium (% Daily Value)
Plain Whole Milk	150	0	8	30
Plain Reduced Fat 2% Milk	130	0	5	30
Plain Lowfat 1% Milk	110	0	2.5	30
Chocolate Lowfat 1% Milk	160	16	2.5	30
Plain Fat-Free Milk	80	0	0	30
100% Orange Juice	110	0	0	2
Fruit Punch	110	27	0	0
Sports Drink	60	13	0	0
Sugar-Sweetened Iced Tea	90	22	0	0
Regular Soda	100	26	0	0
Diet Soda	0	0	0	0

Non-nutritive sweeteners can be used in soft drinks in place of sugar. There is some evidence that non-nutritive sweeteners in beverages help manage weight. However, a cautious approach should be taken toward their use in beverages available at school. Research has shown that these beverages can displace milk and 100% juice when they are chosen at mealtimes.[35]

Solutions
for Re-thinking Drinks for Children and Youth

In order to encourage students to make healthier beverage choices, school officials, policy makers, families and community members must recognize the value that smart drink choices will have on the health of children and youth.

Regulations and Recommendations for Schools

The USDA has established regulations to restrict the sale of "Foods of Minimal Nutritional Value"(FMNV) in the food service area during school meal periods. Soda water and carbonated beverages are included in the FMNV definition.[36]

In 1976, the North Carolina State Board of Education adopted a policy stating that all food and beverages sold in the school must contribute to the nutritional well-being of the child and aid in establishing good food habits. This standard was changed by North Carolina G.S. 115C-264 (1991) which states that each school may, with the approval of the local board of education, sell soft drinks to students so long as soft drinks are not sold (i) during the lunch period, (ii) at elementary schools, or (iii) contrary to the requirements of the National School Lunch Program. This section of the statute permits the sale of soft drinks in middle and high schools between the breakfast and lunch periods or after school as long as those sales are not contrary to the National School Lunch Program.

In the 2005 session, the North Carolina General Assembly passed S.L. 2005-457 (H 855) enacting G.S. 115C-264.3, which required the State Board of Education to establish statewide nutrition standards for school meals, à la carte foods and beverages and items served in the After School Snack Program. As a result, the N.C. State Board of Education adopted N.C. Nutrition Standards for Elementary Schools in October 2006.[37] Mandatory implementation of the standards for all North Carolina elementary schools is required by the end of the 2008-09 school year. Standards will also be developed for middle and high schools.

Fruit juice can be a healthy, natural source of vitamins A and C, potassium, and, if fortified, calcium. Although fruit juice can provide some benefits, excessive juice consumption can mean intake of too many calories and too much sugar. The American Academy of Pediatrics (AAP) recommends that fruit juice intake be limited to 4 to 6 ounces/day for children 1-6 years old and eight to 12 ounces/day for children ages 7-18. The Dietary Guidelines for Americans 2005 recommend that most servings of fruit should be whole fruit. Read labels carefully. A fruit juice drink, beverage, cocktail or "ade" contains less than 100 percent juice. Some contain only 5 percent or 10 percent juice and have added sweeteners.[38]

The Standards are intended to promote gradual changes to increase the number of servings of fruits, vegetables, and whole-grain products offered and decrease foods high in total fat, trans fat, saturated fat, cholesterol and sugar. Allowable beverages in elementary schools will be limited to the following:

- Water
- 1% or less fat milk choices
- 50% or more fruit juice with no added sweeteners (≤ 8 oz. portion)

To achieve a healthier school environment, the N.C. Department of Public Instruction recommends that beverages available on campus at all grade levels during the school day be limited to the following items:

- Milk containing 1% or less fat (flavored or unflavored)
- Bottled water
- Bottled flavored water
- Beverages with 50% or more fruit juice
- Beverages with no more than 20 calories per serving
- Diet carbonated beverages (may not be sold during breakfast and lunch periods)
- Isotonic sports beverages or caloric equivalent (high schools only)

These recommendations apply to all areas throughout the school campus. This includes the Child Nutrition Program, school vending, school stores and other venues where beverages are available

Students who participate in the National School Breakfast and School Lunch Programs consume more servings of milk, fruit and vegetables and fewer servings of soda and fruit drinks.[39]

to students. These recommendations do not apply to areas on campus where students are not permitted, such as the teacher's lounge, to evening or weekend events such as athletic events, or to other school functions outside the instructional day.[40]

In 2006, the Alliance for a Healthier Generation, the American Beverage Association and three beverage producers signed a memorandum of understanding resulting in new School Beverage Guidelines. A progress report for the 2006-07 school year shows that shipments of full-calorie carbonated soft drinks are 45 percent lower, shipments of water are 23 percent higher and total beverage calories shipped to schools are 41 percent lower compared to 2004 data.[41]

Some school systems have chosen to contract with a soft drink company for the sole sale of one brand, which is referred to as an "exclusive beverage" or "pouring rights" contract. A significant part of the funding comes in an immediate lump sum, with subsequent revenues tied to sales. The American Academy of Pediatrics (AAP) holds that pouring rights encourage students to drink more soft drinks. School districts should get public input before making a decision about a contract. It is important that contracts do not include incentives that encourage students to consume more soft drinks.[42] Consumption or advertising of soft drinks within the classroom should be eliminated.

In North Carolina, only local boards of education may enter into contracts that legally or financially bind the school into an agreement. School personnel (principals, teachers, coaches, etc.) may not enter into service agreements or contracts directly with vendors, unless authority to do so is appropriately delegated by the local Board of Education. If an individual faculty or staff member enters into such a contract or written or verbal agreement with a vendor, without local Board approval, the individual could be held personally financially liable for the agreement.[40]

Schools

- Adhere to federal regulations and state and local policies regarding competitive foods, including soft drinks.
- Work with community partners to develop a comprehensive school nutrition policy that addresses appropriate beverage choices.
- Create demand for nutritious beverages by working with nutrition educators to design and implement educational and marketing activities.
- Never include incentives for increasing students' consumption of soft drinks in vending agreements. Ensure that signage, banners and advertising are prudent and that instructional areas are free of commercial advertising.
- Guide sales in a more positive direction by including the following guidelines in vending agreements:
  —100% fruit or vegetable juice, milk and bottled water are readily available.
  —100% fruit or vegetable juice, milk and bottled water are sold at attractive prices.
  —Soft drink container sizes are moderate (12 ounces rather than 20 ounces).
- Provide vending machines with low-fat and skim milk, including chocolate, strawberry and other popular flavors.
- Provide bottled water in vending machines and ensure access to water at no cost by having an adequate number of strategically placed water coolers or fountains.

Vending Machine Placement and Operation

Many middle and high schools use strategies for limiting the sale of foods and beverages from vending machines.

- Keep all vending machines turned off during regular school hours.
- Keep the machines off until the end of the last lunch period.
- Prohibit the sale of "foods of minimal nutritional value" until 30 minutes after the last lunch period.
- Prohibit the sale of soft drinks until the end of the school day.
- Place vending machines in out-of-the-way places to discourage their frequent use.
- Place vending machines far from the dining areas to optimize students' participation in the school food service program.

Government

- Support the development, implementation and enforcement of state and/or national School Nutrition Standards.
- Require or incentivize local school systems to help fund school food service programs.
- Restrict the marketing of unhealthy beverage choices to children and youth.
- Create policies that provide economic incentives to encourage production and distribution of healthy beverages.

Communities

- Advocate for healthful environments that are consistent with classroom nutrition education.
- Advocate for nutrition standards for all foods and beverages available at school.
- Secure funding for marketing campaigns focused on healthful eating.
- Work through community partnerships to ensure that milk, water and other nutritious beverages are offered wherever less nutritious beverages are available.
- Fund education so that schools do not compromise the health of children and youth by raising funds through the sale of foods and beverages low in nutrients and high in calories.
- Advocate for adequate funding and resources for school food service programs and nutrition education in schools.

Families

- Help children learn to enjoy water as the thirst quencher of choice.
- Offer a variety of low-fat milks and 100% fruit and vegetable juices.
- Limit access to soft drinks (including fruitades, fruit drinks, lemonade, sweet tea and sports drinks) as a "sometimes" beverage to be enjoyed in moderate amounts.
- Encourage children to eat school breakfast and school lunch meals.
- Be a role model by making healthy beverage choices.

References

1. What America Drinks: How Beverages Relate to Nutrient Intakes and Body Weight. Available at www.2424milk.com/drinks.php.

2. What American Drinks: Our Favorite Beverages. American Beverage Association. Available at www.ameribev.org/all-about-beverage-products-manufacturing-marketing--consumption/what-america-drinks/index.aspx.

3. N.C. Department of Revenue.

4. Food and consumption (per capita) data system. USDA Economic Research Services. Available at www.ers.usda.gov.

5. Jacobson MF. Liquid candy: how soft drinks are harming Americans' health. Washington, DC: Center for Science in the Public Interest; 1989. Available at www.cspinet.org/sodapop/liquid_candy.htm.

6. Nestle M. Soft drink "pouring rights": marketing empty calories. Public Health Reports. 2000; 115:308-319.

7. Malik VS, Schulze MB, Hu FB. Intake of sugar-sweetened beverages and weight gain: a systemic review. Am J Clin Nutr 2006; 84:274-88.

8. Rampersaud G, Bailey L, Kauwell G. National survey beverage consumption data for children and adolescents indicate the need to encourage a shift toward more nutritive beverages. J Am Diet Assoc. 2003; 103(1):97-100.

9. Squires S. Soft drinks, hard facts: research suggests kids who drink a lot of soft drinks risk becoming fat, weak-boned, cavity-prone and caffeine addicted. Washington Post; February 27, 2001, p.HE10.

10. Borrud L, Enns CW, Mickel S. What we eat: USDA surveys food consumption changes. Commun Nutr Inst 1997; 27:4-5.

11. Harnack L, Stang J, Story M. Soft drink consumption among U.S. children and adolescents: nutritional consequences. J Am Diet Assoc 1999; 99:436-41.

12. Guthrie JF, Morton JF. Food sources of added sweeteners in the diets of Americans. J Am Diet Assoc. 2000; 100:43-51.

13. Muñoz KA, Krebs-Smith SM, Ballard-Barbash R, Cleveland LE. Food intakes of U.S. children and adolescents compared with recommendations. Pediatrics. 1997; 100:323-329.

14. USDA, Continuing Survey of Food Intake by Individuals (CSFII), 1994-96. Available at www.barc.usda.gov/bhnrc/foodsurvey/Cd98.html

15. U.S. Department of Health and Human Services and U.S. Department of Agriculture, The Dietary Guidelines for Americans 2005. U.S. Government Printing Office, Washington, DC; 2005. Available at www.healthierus.gov/dietaryguidelines.

16. Vartanian LR, Schwartz MB, Brownell KD. Effects of Soft-Drink Consumption on Nutrition and Health: A Systematic Review and Meta-Analysis. Am J Pub Health. 2007; 97:667-675.

17. Putnam JJ, Allshouse JE. Food Consumption, Prices and Expenditures, 1970-1997. Washington, DC: Economic Research Service, U.S. Dept of Agriculture; 1999.

REFERENCES, continued

18. Bray GA, Nielson SJ, Popkin BM. Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity. Am J Clin Nutr. 2004; 79:537-543.

19. Flegal KM, Carroll MD, Ogden CL, Johnson CL. Prevalence and trends in obesity among U.S. adults, 1999-2000. JAMA. 2002; 288:1723-1727.

20. The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity. U.S. Government Printing Office, Washington, DC; 2001. Available at www.surgeongeneral.gov/topics/obesity/.

21. Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of Overweight and Obesity in the United States, 1999-2004. JAMA. 2006; 295(13):1549-1555.

22. North Carolina-Nutrition and Physical Activity Surveillance System (NC-NPASS) 2005 includes data on children seen in North Carolina Public Health Sponsored WIC and Child Health Clinics and some School Based Health Centers. Percentiles were based on the CDC/NCHS Year 2000 Body Mass Index (BMI) Reference.

23. Expert Committee Recommendations on the Assessment, Prevention, and Treatment of Child and Adolescent Overweight and Obesity. JAMA. 2007. Available at www.ama-assn.org/ama1/pub/upload/mm/433/ped_obesity_recs.pdf.

24. Guo SS, Wu W, Chumlea WC, Roche AF. Predicting overweight and obesity in adulthood from body mass index values in childhood and adolescence. American Journal of Clinical Nutrition. 2002; 76:653-8.

25. Dietz WH. Childhood weight affects adult morbidity and mortality. Journal of Nutrition. 1998; 128:411S-414S.

26. The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity. Washington, DC; 2001. Fact sheet: overweight in children and adolescents. Available at www.surgeongeneral.gov/topics/obesity/calltoaction/factsheet06.pdf.

27. Goran MI. Metabolic precursors and effects of obesity in children: a decade of progress, 1990-1999. American Journal of Clinical Nutrition. 2001; 73:158-71.

28. Dietz WH. Health consequences of obesity in youth: childhood predictors of adult disease. Pediatrics. 1998; 101:518-25.

29. Sorof J, Daniels S. Obesity hypertension in children: a problem of epidemic proportions. Hypertension. 2002; 40:441-7.

30. Bradley CB, Harrell JS, McMurray RG, Bangdiwala SI, Frauman AC, Webb JP. Prevalence of high cholesterol, high blood pressure, and smoking among elementary school children in North Carolina. North Carolina Medical Journal. 1997; 58:362-7.

31. Foods Sold in Competition with USDA School Meal Programs. A Report to Congress. U.S. Department of Agriculture. July 16, 2002. Available at www.fns.usda.gov/cnd/Lunch/CompetitiveFoods/report_congress.htm.

32. Apovian CM. Sugar-sweetened soft drinks, obesity and type 2 diabetes. JAMA 2004; 27:205-10.

33. Ludwig DS, Peterson, KE, Gortmaker S. Relationship between consumption of sugar-sweetened drinks and childhood obesity: a prospective, observational analysis. Lancet. 2001; 357: 505-508.

34. USDA Nutrient Analysis Database.

35. Position of the American Dietetic Association: Use of Nutritive and Non-nutritive Sweeteners. JADA. 2004; 104:255-275.

36. Appendix B to 7 CFR Part 210—Categories of Foods of Minimal Nutritional Value. Available at www.fns.usda.gov/cnd/menu/fmnv.htm.

37. North Carolina State Board of Education Policy Manual. Available at http://sbepolicy.dpi.state.nc.us.

38. American Academy of Pediatrics 2001 Policy Statement: The Use and Misuse of Fruit Juice in Pediatrics. Reaffirmed, October 2006. Pediatrics 2007; 119(2):405.

39. Gleason P, Suitor C. Children's Diets in the Mid-1990s: Dietary Intake and Its Relationship with School Meal Participation. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition and Evaluation; 2001. Available at www.fns.usda.gov/oane/menu/published/cnp/files/childiet.pdf.

40. NC Department of Public Instruction Memo March 10, 2006. Local Wellness Policies—Guidance on food and beverage sales in schools.

41. School Beverage Guidelines Progress Report 2006-2007. American Beverage Association. Available at www.schoolbeverages.com/index.aspx.

42. American Academy of Pediatrics Policy Statement: Soft Drinks in Schools. Pediatrics 2004; 113(1):152-54.

Developed by the North Carolina School Nutrition Action Committee (SNAC), a partnership of the N.C. Department of Public Instruction, the N.C. Division of Public Health and the N.C. Cooperative Extension Service. The goal of SNAC is to coordinate school nutrition activities that link the cafeteria, classroom and community to eating smart and moving more.

These institutions are equal opportunity providers.

Suggested citation: Bates T, Albright J, Andersen K, Beth D, Dunn C, Ezzell J, Schneider L, Sullivan C and Vodicka S. Re-Think Your Drink. February 2008. Available at www.eatsmartmovemorenc.com.

NCPH North Carolina Public Health

Public Schools of North Carolina
State Board of Education
Department of Public Instruction

NC STATE UNIVERSITY A&T STATE UNIVERSITY COOPERATIVE EXTENSION
Helping People Put Knowledge to Work