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Soft Drinks and Children: Where's the Science?

Abstract
Research is inconclusive regarding sweetened beverages and weight gain. However, sweetened beverage consumption has been associated with increased caloric intake and decreased diet quality. Beverage consumption should not be at the expense of diet quality. Beverage choices may require careful attention to added sugars and solid fats if a healthful diet as described by MyPyramid is to be achieved. Consumption of sweetened beverages should not exceed the discretionary caloric limit for any eating pattern.

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Introduction

According to the National Health and Nutrition Examination Survey (NHANES) 2003-2004, 17% of US children are overweight (Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006). Overweight is defined as at or above the 95th percentile of body mass index (BMI) for age and gender. Overweight children are at risk for decreased physical and social functioning.

The cause of the increased incidence of pediatric overweight has not been determined. An increase in caloric intake and/or a decrease in physical activity may be involved. The type and amount of food and beverages consumed by children have changed over the years. Some have suggested that the consumption of sweetened beverages may, in part, be responsible for the increase in the incidence of overweight. However, evidence is inconclusive at this time. How then, can we provide science-based education and guidance regarding children's beverage choices?

This commentary examines selected papers and reviews on the subject of sweetened beverage consumption by children. For the purpose of this commentary, sweetened beverages are those drinks sweetened with sugar or high fructose corn sweetener. Drinks that are sweetened with non-caloric sugar substitutes are not included.

Beverage Consumption and Weight Gain

Children are consuming larger portions and more servings of sweetened beverages than in 1977 (Nielsen & Popkin, 2004). By age 13 years, children consume more soda than milk (Rampersauld, Bailey, & Kauwell, 2003). The mean intake of soft drinks by children is 12 ounces (French, Lin, & Guthrie, 2003). Soda is served to some young children; 39% of preschool children drink soda (O'Connor, Yang, & Nicklas, 2006).

Children obtain soda in a variety of venues. Of the soda that children drink, about half of it is obtained in the home, 22% in fast-food restaurants, and 7% from vending machines and school

cafeterias (Wiecha, Finklestein, Troped, Fragala, & Peterson, 2006; French, Lin, & Guthrie, 2003).

It may not be surprising that the primary reason why children drink soft drinks is because they enjoy the taste; other reasons include availability of soda in the home and modeling of the behavior by parents and friends (Grimm, Harnack, & Storey, 2004).

Is soda responsible for the weight gain that is so prevalent among children? Research regarding sweetened beverages and weight is inconsistent (Bachman, Baronowski, & Nicklas, 2006; Malik, Schulze, & Hu, 2006). Soft drink consumption has been associated with higher energy intakes and may be associated with increased BMI. However, some researchers have found no association between sweetened beverages and weight. One study suggested that children with a higher BMI may be more sensitive to the interaction between weight change and beverage consumption.

It is unknown at this time whether sweetened beverages are contributing to childhood obesity. As science-based educators, our rationale for our recommendations must remain consistent with the science.

Beverage Consumption and Diet Quality

Beverages account for 20% of the daily calories of children. Therefore, an assessment of the contribution of beverages to diet quality may be warranted.

Sweetened beverage consumption may affect diet quality. Soft drink consumption is negatively associated with calcium intake. An inverse relationship between sweetened beverage consumption and milk consumption has been shown. However, caution is necessary because association does not demonstrate causation. As with beverages and obesity, the evidence is inconsistent regarding the consumption of sweetened beverages and milk displacement (Bachman, Baranowski, & Nicklas, 2006).

Milk is the main source of calcium in the diets of children. Children who do not consume dairy foods may have difficulty in meeting calcium needs and perhaps vitamin D as well. Children who avoid drinking milk tend to have a smaller stature, poor bone health, and increased risk for bone fractures compared to children who drink milk. Limited research suggests that calcium may play a role in helping to maintain a healthful body weight.

Therefore, children who do not consume the recommended daily servings of milk, for any reason, need to plan their diets carefully to ensure adequate intakes of calcium, vitamin D, and other important nutrients.

Beverages and MyPyramid

Where does that leave Extension educators? Our approach and recommendations should be consistent with the 2005 Dietary Guidelines for American and MyPyramid for Kids. Two of the Dietary Guidelines key recommendations specifically address added sugars.

- Consume a variety of nutrient-dense foods and beverages within and among the basic food groups while choosing foods that limit the intake of saturated and trans fat, cholesterol, added sugars, salt and alcohol.
- Choose and prepare foods and beverages with little added sugars or caloric sweeteners, such as amounts suggested by the USDA Food Guide and the DASH Eating Plan.

Children over the age of 9 years need to consume 3 cups of milk (or milk cup equivalents) daily. Serving children milk with meals may help them obtain the recommended intake.

Fruit and/or vegetable juice is appropriate. However, the American Academy of Pediatrics recommends that juice should be limited. Preference should be given to whole fruit and vegetables because of their fiber.

The Dietary Guidelines for Americans, MyPyramid, and MyPyramid for Kids introduce the concept of Discretionary Calories. Discretionary calories include added sugars in foods and beverages, and solid fats. For example, discretionary calories should not exceed 195 for an 1,800-calorie eating plan or 9.2% of total calories. One 12-ounce serving of soda contains approximately 140 calories (Table 1). This leaves few calories (55) for food choices such as whole or reduced fat milk and cheese or sweetened cereal.

Table 1.
Caloric Intake of Selected Sweetened Beverages

Beverage	**Approximate Calories per 12-oz. Portion**
Sports drink	105
Energy drink	165
Juice drink	180

Regular soda	140

Implications

As research in the area of beverages, weight, and diet quality continues to evolve, so too will our understanding of best practice principles. However, we need not wait until definitive research is available--we can act on the best available evidence.

Although research is inconclusive regarding sweetened beverages and weight gain, we suggest recommending milk with meals and water with snacks and urge the limitation of sweetened beverage consumption to the discretionary calorie allowance. The consumption of one-12 ounce soda requires the judicious attention to added sugar and solid fat calories in order to maintain a healthful diet.

Extension educators should help consumers understand that a quality diet necessitates the careful consideration and consumption of added sugars.

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Discussion