

## Serving Up the Science

### Highlights of Research on Juice Consumption and Its Potential Impact on Bodyweight

There are some general misconceptions about the appropriateness of 100% fruit juices as part of the diet, especially children's diets. **The truth is that scientific research does not support a link between 100% fruit juice consumption and overweight status in children or adults.**

A number of recent research studies have been conducted that look at a possible relationship between 100% juice consumption and its potential impact on body weight. Of the studies which are specific to 100% juice consumption and overweight status, most find no connection with consumption up to 12 ounces per day.

Highlights from the most recent studies can be found below:

*Faith, M, Dennison, BA, Edmunds, L, Stratton, H. Fruit Juice Intake Predicts Adiposity Gain In Children From Low-Income Families: Weight Status-by-Environment Interaction. Pediatrics. November 2006. 118:5:2066-2075.*

This research studied preschool children's dietary intakes along with parental feeding practices, attitudes, and effects of parental nutrition counseling. All of the 2,081 study subjects were participants in New York's Special Supplemental Nutrition Program for Women, Infants and Children (WIC). Parental reports of offering more fruits servings were associated with a decreased risk of adiposity compared to an increased risk found with each increased serving of fruit juice, but again, was limited to the heavier children. **Excessive consumption of fruit juice (24-30 ounces per day) was found to promote increases in adiposity, but this association was seen only in children who were already overweight or at risk of overweight** (whose BMI's were high, in the 85th percentile or greater as defined by the Centers for Disease Control and Promotion). **No association was found among normal weight children.** (Note: These large amounts of juice far exceed any current recommendations for preschool children. There also was no association found between overweight (increased adiposity) and juice among any of the children who were consuming amounts recommended by the American Academy of Pediatrics (AAP). The AAP guidelines are for 4-6 ounces for children 1-6 years old and 8-12 ounces for those 7-18 years old. The researchers state they did not account for total calorie intake and physical activity, but they have suggested that excess juice consumption may be an indicator of passive overconsumption of all caloric sources. The research paper also did not clarify that only 100 percent fruit juices (which are not sugar-sweetened) were included in the juice category. "These findings are suggestive of a gene-by-environment interaction for excess weight gain, as the effects of juice intake on adiposity gain are strongest among children who were already the heaviest and most vulnerable to weight gain." (Note: Currently, the government funded WIC program only allocates about 10 ounces a day for each of the children in the program.)

*O'Connor. M. , Yang, S, and Nicklas, T. Beverage Intake Among Preschool Children and Its Effect on Weight Status. Pediatrics. October 2006. 118:4:1010-1018.*

Baylor College of Medicine researchers evaluated dietary patterns of beverage intakes by children aged 2-5 from the NHANES 1999-2002 database. Included in the analysis was consumption of total calories and 100 percent juices consumed using 24-hour recall obtained by trainer interviewers; other data was collected, including results from a physical examination. Statistical relationships between total calories consumed, amounts of juice consumed and body mass index were then analyzed. Of the 1160 children who had complete data appropriate for the analysis, the researchers determined that only 48 percent of the children were even consuming 100 percent juice. Mean consumption of 100 percent juice was 4.7 ounces daily which the authors state is in keeping with recommended juice intake from the American Academy of Pediatrics. (95th percentile confidence interval: 4.04-5.36 ounces). The researchers then determined there was no relationship between increased total calorie intake, increased juice consumption and body mass index among those who consumed 100 percent juice. **The researchers stated that although more prospective research is needed to evaluate all beverage consumption as children age, “the findings of this research support previous studies by Skinner et al and Newby et al that 100 percent fruit juice consumption is not associated with overweight status in preschool-aged children.”**

*Fulgoni, V, Taylor, S. Consumption of 100 Percent Juices is Not Associated With Being Overweight or Risk of Being Overweight in Children. Experimental Biology. Abstract. April 2, 2006. (unpublished study)*

The objective of this research was to examine the impact of 100 percent juice in children's diets on bodyweight and BMI among more than 7,500 children ages 2-18. This analysis of NHANES data (1999-2002) was combined with growth chart data from the Centers for Disease Control and Promotion (CDC). **While there were no differences specifically in BMI between the juice consumers and non-juice consumers for children ages 2-11, there were differences in children ages 12-18 years; these older juice consumers had significantly lower BMIs than those who drank no juice at all. Children who drank 100 percent juice also had healthier overall diets than non-juice consumers and consumed more total fruits, fiber and key nutrients such as vitamin C, potassium, magnesium and folate.**

*Newby PK, Peterson KE, Berkey CS, Leppert J, Willett WC, Colditz GA. Beverage consumption is not associated with changes in weight and body mass index among low-income preschool children in North Dakota. J Am Diet Assoc. July 2004. 104:7:1086-1094.*

Data on dietary and growth parameters for 1,345 children were provided by the North Dakota Women, Infants and Children's (WIC) Program for this study that analyzed beverage consumption and obesity parameters. In this analysis, mean consumption of fruit juice (10.8 ounces per day for girls and 10.6 ounces per day for boys) was more than double that reported for children age 2 to 18 years from the 1994-96 and 1998 Continuing Survey of Food Intakes by Individuals which found a mean consumption of 4.6 ounces per day. The researchers also found that in this WIC population, close to 50% of the children consumed 12 ounces or more fruit juice per day. However, the results of the regression analysis found no association between 100% fruit juice intake and weight changes. Although the researchers were not able to control for other major risk factors for obesity, such as parental BMI, physical activity, and television viewing, they postulate that "perhaps children who are more physically active drink more beverages, and thus if we were able to include measures of physical activity (or inactivity) in our models we would better understand associations between beverage intake and weight change." **"Our results are consistent with other prospective studies that have found that fruit juice is not related to childhood obesity....Current scientific evidence does not support a positive association between fruit juice and milk consumption and obesity; hence, they may still be recommended to children in reasonable amounts because they are an important source of nutrients and energy."**

*Rampersaud GC, Bailey LB, Kauwell GP. National survey beverage consumption data for children and adolescents indicate the need to encourage a shift toward more nutritive beverages. J Am Diet Assoc. January 2003. 103:97-100.*

The researchers used national survey data (1994-96, 1998 Continuing Survey of Food Intakes by Individuals) to evaluate intake of 100% fruit juices intakes to compare with the American Academy of Pediatrics' (AAP) recommendations on fruit juice consumption. The researchers found that mean intakes of 100% juice were within AAP recommendations for all age groups from six months to 18 years (a total of 5,559 children's data were included in the analysis). Other than the importance of discouraging anything other than breast milk, infant formula and water before a child is six months old, the researchers stated, **"There is no conclusive evidence to suggest that in most cases, intake of 100% fruit juice should be restricted in children and adolescents...."** **"For the majority of children and adolescents...promotion of moderate intakes of 100% fruit juice as part of a healthful and varied diet is consistent with public health recommendations for increasing fruit and vegetable intake to optimize health and reduce risk for chronic disease."**

*Skinner JD, Carruth BR. A longitudinal study of children's juice intake and growth: the juice controversy revisited. J Am Diet Assoc. April 2001. 101: 432-437.*

This study of 72 children (including those enrolled in a long-term longitudinal study) evaluated beverage intake (including 100% juice) and growth parameters over four years, when study participants in the study were ages 24-72 months. Although some of the juice intakes at single interviews showed a higher number of children consuming 12 ounces or more juice per day than did the longitudinal mean, growth parameters did not indicate any overweight in these children. Analysis of the data found there were no statistically significant associations between 100% juice intake and children's height, weight and body mass index. **“In contrast to the Dennison et al study, results of this study consistently showed no relationship between children's intake of 100% juice and any measure of overweight....” “One hundred percent juices are acceptable, affordable, and nutritious beverages that do not compromise children's growth.”**

*Skinner, JD, Carruth, BR, Moran, J, Houck, K, and Coletta, F. Fruit Juice Intake Is Not Related to Children's Growth. Pediatrics. Vol. 103 No. 1 January 1999, pp. 58-64.*

Data for this research was derived in part from an ongoing longitudinal study as well as dietary interviews with a total of 105 children. The purpose of the data analysis was to evaluate if excess fruit juice intake (12 ounces or greater) was associated with short stature and obesity in preschool children. The researchers assessed growth parameters and 100% fruit juice intake in children between 24 to 36 months. Growth parameters of children consuming 12 ounces or more per day of 100% fruit juice were compared with those consuming less than 12 ounces per day. **The researchers concluded that there were no statistically significant differences in children's height, body mass index, or ponderal index related to fruit juice intake between those consuming more or less than 12 ounces daily.** “The consistent lack of relationship between children's fruit juice intake and growth parameters in our study does not support previous recommendations to limit the intake of 100% juice to less than 12 ounces/day.”

[http://fruitjuicefacts.org/serving\\_up\\_the\\_science.html](http://fruitjuicefacts.org/serving_up_the_science.html)