



Does 100% fruit juice pose a health risk to kids akin to added-sugar drinks?

*This is a summary of the findings of an HFA-commissioned survey of research into the health effects of 100% fruit juice, appearing in the April 2017 issue of *Pediatrics*, the journal of the American Academy of Pediatrics. [Read the article here.](#)*

Fruit Juice and Change in Body Mass Index: A Meta-Analysis

Executive Summary

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The question of whether 100% fruit juice causes poor health outcomes in children, such as weight gain, has been a subject of controversy. On one hand, 100% fruit juice contains vitamins and nutrients that many children lack, is often cheaper than whole fruit, and may help kids with limited access to healthy food meet their daily fruit requirements.

On the other, leading nutrition experts have expressed concern that fruit juice contains amounts of sugar equal to or greater than those of sugary drinks like regular soda. Guidelines from the American Academy of Pediatrics (AAP) and the Robert Wood Johnson Foundation's Healthy Eating Research program warn that 100% juice can be a significant source of calories and contribute to obesity if consumed excessively.

Thus, they recommend that children should consume whole fruit instead of 100% fruit juice whenever possible. Since 2001, the AAP has recommended specific limits on how much 100% fruit juice children drink each day:

- None until age 1;
- No more than 4-6 ounces/day between ages 1 and 6 years; and
- No more than 8-12 ounces per day between ages 7 and 18 years.

Two-thirds of children drink 100% fruit juice by age 1, and almost one-third of children under age 6 consume more juice than the AAP recommends. Older children drink less of it: Only 2% of children ages 7-18 exceed AAP's recommended limit of 12 ounces per day.

This study sought to answer the question, "Is consumption of one standard serving size of 100% fruit juice each day associated with weight gain in children?" Because there are no randomized controlled trials – the gold standard for nutrition studies – to provide evidence for juice recommendations for children, we undertook a systematic review and meta-analysis of existing research to synthesize the best available evidence. We systematically searched four scientific databases to answer this question and found eight studies – following a total of 34,470 children over time – and combined the results.

We did not find strong evidence that one serving per day of 100% fruit juice was associated with weight gain. In children ages 1-6, consumption of one daily serving was independently associated with a weight gain of only 0.08-0.15 kg (0.18-0.33 pounds) over one year. In children ages 7-18, 100% fruit juice was not independently associated with any weight gain.

The conclusions of this survey have limitations. Although we combined evidence from the best available research, the studies were not randomized controlled trials. Randomized controlled trials are the most trustworthy level of scientific evidence, and sometimes contradict conclusions from non-experimental studies like those in our meta-analysis. We did not examine other important health outcomes besides weight gain, such as diabetes risk, because too few studies exist on this topic in children. Two recent studies of children ages 1-3 (included in this meta-analysis) found clinically significant amounts of weight gain in this age group from one serving a day, and it may be possible that this age group is at higher risk for weight gain from drinking 100% fruit juice than older children.

More research should examine whether children under age 3 are at higher risk of weight gain from drinking 100% fruit juice. Randomized controlled trials examining the effect of 100% fruit juice consumption on metabolic and health outcomes, including weight gain, are needed in children 1-6. **Our results support current recommendations** from the American Academy of Pediatrics' and Robert Wood Johnson's Healthy Eating Research program that children ages 1-6 limit 100% fruit juice to 4-6 ounces per day and children ages 7-18 limit juice to 8-12 ounces a day.

This study does not resolve the debate about the health effects of 100% fruit juice among children. However, our study provides evidence that children may drink 100% fruit juice in moderation, and that the existing recommendations on daily limits are prudent.

Comparing the health impacts of 100% fruit juice with added-sugar drinks

Health Risk	Drinks with Added Sugar (soda, fruit-flavored drinks, etc.)	100% Fruit Juice (without added sugar)
Tooth Decay	<p>Adults: 31% increased risk of tooth decayⁱ (individual study)</p> <p>Children: 83% increased chance of cavities at age 6 if consumed at least 3x per week in infancyⁱⁱ (individual study)</p>	<p>Children: 20% increased chance of tooth decayⁱⁱⁱ (meta-analysis)</p>
Weight Gain	<p>Children: 55% increased chance of weight gain in kids^{iv} (meta-analysis)</p> <p>Adults: 1 serving/day independently associated with weight gain of 1 lb. over 4 years^v (meta-analysis)</p>	<p>Children: No evidence of increased risk^{vi,vii,viii} (1 systematic review and 2 meta-analyses)</p> <p>Adults: 1 serving/day independently associated with weight gain of 0.3 lb. over 4 years^{ix} (1 meta-analysis and 1 systematic review)</p>
High Blood Pressure	<p>Adults: 12% increased risk of high blood pressure^x (meta-analysis)</p>	<p>No evidence of increased risk³ (meta-analysis)</p>
Diabetes	<p>Adults: 26% increased risk of diabetes^{xi} (meta-analysis)</p>	<p>No evidence of increased risk^{xii, xiii} (meta-analyses)</p>
Cardiovascular Disease	<p>Adults: 17% increased risk of coronary heart disease^{xiv} (meta-analysis); 19% increased risk of heart attack^{xv} (meta-analysis)</p>	<p>No evidence of increased risk^{xvi,xvii,xviii} (individual studies)</p>

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