

**AMERICAN ACADEMY OF PEDIATRICS
Committee on Nutrition**

The Use and Misuse of Fruit Juice in Pediatrics

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FROM ABSTRACT

Historically, fruit juice was recommended by pediatricians as a source of vitamin C and an extra source of water for healthy infants and young children as their diets expanded to include solid foods with higher renal solute.

Fruit juice is marketed as a healthy, natural source of vitamins and, in some instances, calcium.

Because juice tastes good, children readily accept it.

Although juice consumption has some benefits, it also has potential detrimental effects.

Pediatricians need to be knowledgeable about juice to inform parents and patients on its appropriate uses.

THE COMMITTEE ALSO NOTES:

In 1997 US consumers spent about \$5 billion on juice.

US juice consumption is more than 2 billion gal/y or 9.2 gal/y per person.

Children are the largest group of juice consumers.

Children younger than 12 years account for only about 18% of the population but consume 28% of all juice.

By age 1 year, about 90% of infants consume juice.

The daily juice consumption by infants is about 2 oz/d, 2% consume more than 16 oz/d, and 1% of infants consume more than 21 oz/d.

Toddlers consume about 6 oz/d.

10% of children 2 - 3 years old and 8% of children 4 - 5 years old drink more than 12 oz/d on average.

DEFINITIONS

The Food and Drug Administration (FDA) requires that a product be 100% fruit juice to be labeled as a fruit juice.

Beverages that are less than 100% fruit juice must list the percentage of the product that is fruit juice.

Reconstituted juices from concentrate must be labeled.

COMPOSITION OF FRUIT JUICE

Fruit juice is mostly water.

Carbohydrates such as sucrose, fructose, glucose, and sorbitol, are the next most prevalent nutrient in juice.

This carbohydrate concentration varies from 11 g/100 mL to more than 16 g/100 mL, while human milk and infant formulas have a carbohydrate concentration of 7 g/100 mL.

“Juice contains a small amount of protein and minerals.”

Juices fortified with calcium have about the same calcium content as milk.

Some juices have high contents of potassium, vitamin A, and vitamin C, and some juices are fortified with vitamin C.

“The vitamin C and flavonoids in juice may have beneficial long-term health effects, such as decreasing the risk of cancer and heart disease.”

“Juice contains no fat or cholesterol, and unless the pulp is included, it contains no fiber.”

“The fluoride content of concentrated juice varies with the fluoride content of the water used to reconstitute the juice.”

ABSORPTION OF CARBOHYDRATE FROM JUICE

“The 4 major sugars in juice are sucrose, glucose, fructose, and sorbitol.”

“Carbohydrate that is not absorbed in the small intestine is fermented by bacteria in the colon.”

This bacterial fermentation results in the production of several gasses.

“Nonabsorbed carbohydrate presents an osmotic load to the gastrointestinal tract, which causes diarrhea.”

“Malabsorption of carbohydrate in juice, especially when consumed in excessive amounts, can result in chronic diarrhea, flatulence, bloating, and abdominal pain.”

The malabsorption of carbohydrate resulting from large intakes of juice is the basis for some health care providers to recommend juice for the treatment of constipation.

JUICE IN THE FOOD GUIDE PYRAMID

Fruit is one of the 5 major food groups in the Food Guide Pyramid.

It is recommended that children 1-4 years old should have 2 fruit servings per day, and those 10-18 years old should consume 4 fruit servings per day.

Half of these servings can be provided in the form of fruit juice, but not fruit drinks.

“A 6-oz glass of fruit juice equals 1 fruit serving.”

Fruit juice offers no nutritional advantage over whole fruit, and fruit juice lacks the fiber of whole fruit.

MICROBIAL SAFETY OF JUICE

“Only pasteurized juice is safe for infants, children, and adolescents.”

“Pasteurized fruit juices are free of microorganisms.”

Unpasteurized juice may contain pathogens, such as *Escherichia coli* and *Salmonella* and *Cryptosporidium* organisms, and these organisms can cause serious disease.

Unpasteurized juice should “never be given to infants and children.”

INFANTS

"The American Academy of Pediatrics (AAP) recommends that breast milk be the only nutrient fed to infants until 4 to 6 months of age."

"There is no nutritional indication to feed juice to infants younger than 6 months."

Offering juice before solid foods are introduced into the diet could result in reduced intake of protein, fat, vitamins, and minerals such as iron, calcium, and zinc.

"Malnutrition and short stature in children have been associated with excessive consumption of juice."

At 4 to 6 months of age, solid foods can be introduced into the diets of infants.

"The AAP recommends that single-ingredient foods be chosen and introduced 1 at a time at weekly intervals."

"It is prudent to give juice only to infants who can drink from a cup (approximately 6 months or older)."

"Prolonged exposure of the teeth to the sugars in juice is a major contributing factor to dental caries."

"The AAP and the American Academy of Pedodontics recommendations state that juice should be offered to infants in a cup, not a bottle, and that infants not be put to bed with a bottle in their mouth."

"The practice of allowing children to carry a bottle, cup, or box of juice around throughout the day leads to excessive exposure of the teeth to carbohydrate, which promotes development of dental caries."

Fruit juice should be used as part of a meal or snack, and should not be sipped throughout the day or used as a means to pacify an unhappy infant or child.

TODDLERS AND YOUNG CHILDREN

"Most issues relevant to juice intake for infants are also relevant for toddlers and young children."

Fruit juice is easily overconsumed by toddlers and young children because they taste good.

Also, fruit juice is conveniently packaged or can be placed in a bottle and carried around during the day.

"Because juice is viewed as nutritious, limits on consumption are not usually set by parents."

"High intakes of juice can contribute to diarrhea, overnutrition or undernutrition, and development of dental caries."

OLDER CHILDREN AND ADOLESCENTS

"It is important to encourage consumption of the whole fruit for the benefit of fiber intake and a longer time to consume the same kilocalories."

"Excessive juice consumption and the resultant increase in energy intake may contribute to the development of obesity."

CONCLUSIONS

- (1) "Fruit juice offers no nutritional benefit for infants younger than 6 mo."
- (2) "Fruit juice offers no nutritional benefits over whole fruit for infants older than 6 months and children."
- (3) "One hundred percent fruit juice or reconstituted juice can be a healthy part of the diet when consumed as part of a well-balanced diet. Fruit drinks, however, are not nutritionally equivalent to fruit juice."
- (4) "Juice is not appropriate in the treatment of dehydration or management of diarrhea."
- (5) "Excessive juice consumption may be associated with malnutrition (overnutrition and undernutrition)."
- (6) "Excessive juice consumption may be associated with diarrhea, flatulence, abdominal distention, and tooth decay."
- (7) "Unpasteurized juice may contain pathogens that can cause serious illnesses."
- (8) "A variety of fruit juices, provided in appropriate amounts for a child's age, are not likely to cause any significant clinical symptoms."

RECOMMENDATIONS

- (1) "Juice should not be introduced into the diet of infants before 6 months of age."
- (2) "Infants should not be given juice from bottles or easily transportable covered cups that allow them to consume juice easily throughout the day."
- (2a) "Infants should not be given juice at bedtime."
- (3) Intake of fruit juice should be limited to:
 - 4 to 6 oz/d for children 1 to 6 years old.
 - 8 to 12 oz or 2 servings per day for children 7 to 18 years old.
- (4) "Children should be encouraged to eat whole fruits to meet their recommended daily fruit intake."
- (5) "Infants, children, and adolescents should not consume unpasteurized juice."
- (6) Pediatricians should routinely discuss the use of fruit juice and fruit drinks and should educate parents about differences between the two.

Committee on Nutrition, 1999-2000

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