

OJ Nutrition

HOW

100% ORANGE JUICE

FITS INTO A HEALTHY DIET

for Children



Dear Health Professional,

At a time when children's health and wellness is a growing concern in the United States, promoting a healthy diet that focuses on choosing nutrient-dense foods and beverages within calorie needs has never been more important. And in a world where consumers are exposed to hundreds of messages about food and health, The Florida Department of Citrus knows that you are a trusted and valued source of information for parents and caregivers who want their children and families to lead healthier, more active lives.

Consuming nutrient-dense beverages such as 100% orange juice can help children meet both food group and nutrient intake recommendations. As stated by the 2010 Dietary Guidelines Advisory Committee, "when consumed in moderation as part of a nutrient-rich, energy-balanced diet, 100% juice can be a healthy part of a child's diet.¹ As a complement to whole fruit, the consumption of 100% orange juice can be a strategy to help children meet current recommendations for fruit and promote nutrient adequacy and improved diet quality.

Unfortunately, media frequently report misinformation about 100% orange juice and the sugar naturally present in orange juice, which can cause confusion and uncertainty among parents about the healthfulness of 100% orange juice and its role in a child's diet. That's why we've developed the "OJ Nutrition: How 100% Orange Juice Fits into a Healthy Diet for Children" booklet to provide you with facts about the nutritional benefits of 100% orange juice that can be shared with your colleagues, patients and families. The booklet includes the following:

- **Make it Count – The Facts About 100% Orange Juice and Fruit Intake:** Illustrates the role of 100% orange juice as a complement to whole fruit in helping children meet daily fruit and nutrient intake recommendations.
- **Squeeze the Most out of Beverages with Nutrient-Dense 100% Orange Juice:** Outlines the valuable nutrient contributions of 100% orange juice to the diets of children.
- **Key Research Findings: 100% Orange Juice/100% Fruit Juice Consumption by Children:** Highlights and references key research findings related to 100% orange juice/100% fruit juice intake and body weight measures, as well as scientific support and research findings that document the nutritional benefits and enhanced diet quality associated with the consumption of 100% orange juice/100% fruit juice by children and adolescents.


We hope the information in this booklet will assist you in providing sound and evidence-based advice to your patients and families about consuming 100% orange juice as part of a healthy, well-balanced diet. An electronic version is available at OJNutritionForChildren.com, along with the latest science-based information and resources. Please feel free to contact us at ojnutritioninfo@citrus.myflorida.com.

Sincerely,



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¹ Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans 2010; Part E. Appendices: Appendix E-1: Major Conclusions. May 2010. p. 406.



MAKE IT COUNT

The Facts About

100% Orange Juice and Fruit Intake

With the recent increase in media coverage about the role of beverages in health, consumers continue to be challenged to make informed beverage choices. With so many products available, it is important to know that naturally nutrient-dense beverages, such as 100% orange juice, can and should be part of a healthful diet.





Only children under age nine are eating enough fruit.

FRUIT CONSUMPTION IN AMERICA

Few Americans consume the recommended amounts of fruit each day. According to the *2010 Dietary Guidelines for Americans*, Americans consume only 42 percent of the recommended intake for

fruits, and a study using National Health and Nutrition Examination Survey (NHANES) data reports 80 percent of the U.S. population have mean usual intakes of fruit that fall short of daily recommendations.¹²

FRUIT CONSUMPTION GAPS³

AGE GROUP	AGE RANGE	TOTAL FRUIT INTAKE MEAN (CUP EQUIVALENTS)	FRUIT INTAKE GOALS/GOAL RANGES (PER USDA MYPLATE)
Children	1-3	1.5	1 cup (for ages 2-3)
Children	4-8	1.1	1 – 1 ½ cups
Males	9-13	1.0	1 ½ cups
Females	9-13	1.0	1 ½ cups
Males	14-18	1.0	2 cups
Females	14-18	0.8	1 ½ cups
Males	19+	1.1	2 cups
Females	19+	1.0	1 ½ cups - 2 cups

One glass of 100% orange juice is a convenient and easy way to complement whole fruit intake, help meet daily fruit intake recommendations and help fill nutrient gaps. One 8-ounce glass is a good source of potassium

and folate and an excellent source of vitamin C – three important nutrients underconsumed in the United States.¹ And 100% orange juice is more nutrient-dense than many commonly consumed 100% fruit juices.⁴

100% ORANGE JUICE & THE DIETARY GUIDELINES FOR AMERICANS

Americans look for guidance in making healthful beverage choices, and 100% orange juice is naturally nutrient-dense and a healthy beverage option with no added sugars. The *2010 Dietary Guidelines for Americans* recognize that 100% fruit juice supplies a substantial amount of nutrients along with the calories they contain, and include 100% juice as a complement to whole fruit to meet fruit intake needs.¹ According to the Guidelines, the majority of fruit recommended should come from whole fruits, but when juices are consumed, 100% juice should be encouraged.



“Fat-free or low-fat milk and **100% fruit juice** provide a substantial amount of nutrients along with the calories they contain.”

- *2010 Dietary Guidelines for Americans*



100% ORANGE JUICE AND USDA MYPLATE



U.S. Department of Agriculture

USDA *MyPlate* recognizes that any fruit or 100% fruit juice counts as part of the Fruit Group. Fruits may be fresh, canned, frozen, or dried, and may be whole, cut-up, or pureed.

Each 8-ounce glass counts as one cup of fruit from the MyPlate Fruit Group.

DAILY FRUIT INTAKE RECOMMENDATIONS⁵

CHILDREN	2-3 years old	1 cup
	4-8 years old	1 - 1 ½ cups
GIRLS	9-13 years old	1 ½ cups
	14-18 years old	1 ½ cups
BOYS	9-13 years old	1 ½ cups
	14-18 years old	2 cups
WOMEN	19-30 years old	2 cups
	31-50 years old	1 ½ cups
	51+ years old	1 ½ cups
MEN	19-30 years old	2 cups
	31-50 years old	2 cups
	51+ years old	2 cups

Note: These amounts are appropriate for individuals who get less than 30 minutes per day of moderate physical activity, beyond normal daily activities. Those who are more physically active may be able to consume more while staying within calorie needs.

“Most people benefit from eating more fruits and vegetables every day. All forms count: fresh, frozen, canned, dried, and 100% juice.”⁶

Produce for Better Health Foundation

“Inclusion of fruit juice, in amounts consistent with dietary recommendations, as part of a healthy diet can provide important nutrients without increasing weight in children.”⁷

O’Neil et al.
American Journal of Health Promotion

“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.”¹⁴

American Academy of Pediatrics Committee on Nutrition

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100% ORANGE JUICE IS APPROPRIATE IN CHILDREN'S DIETS

One hundred percent orange juice can **help children get the nutrients they need** and help meet fruit intake recommendations.



Researchers who analyzed data from 2003-2006 NHANES found children who regularly consume 100% orange juice tended to have significantly higher intakes of vitamin C, potassium, vitamin B6, folate, dietary fiber and magnesium than non-consumers. In addition, diet quality (as measured by the Healthy Eating Index (HEI-2005)) was significantly higher in those children consuming 100% orange juice than in non-consumers, as was intake of total fruit, fruit juice and whole fruit.⁹ Also, data suggest that drinking 100% orange juice is not linked to decreased milk consumption in children,⁹ and milk and 100% fruit juice have

been found to be complements in children's diets.¹⁰

One hundred percent orange juice can help children get the nutrients they need and help meet fruit intake recommendations. Consumption of 100% orange juice or fruit juice has been associated with improved diet quality and nutrient adequacy in children.¹¹⁻¹³ A 4-ounce serving of 100% orange juice provides one half-cup of fruit, and contains fewer than 60

calories along with essential vitamins, minerals and phytochemicals.

The American Academy of Pediatrics (AAP) recommends that pediatricians should routinely discuss the use of fruit juice and fruit drinks/beverages and should educate parents about the difference between the two.¹⁴ The AAP makes the following recommendations regarding limits for daily intake of 100% fruit juice:

AGE	OUNCES OF 100% JUICE
1-6	4-6 ounces
7-18	8-12 ounces

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Squeeze the Most Out of Beverages

with Nutrient-Dense

100% ORANGE JUICE

One hundred percent orange juice is a natural source of essential vitamins and minerals needed for good health, and phytochemicals that may be beneficial to improving health. Research suggests adults and children who consume 100% orange juice tend to have better overall diet quality and nutrient adequacy as compared to those who don't consume 100% orange juice.¹⁻⁴ Specifically, data from the 2003-2006 National Health and Nutrition Examination Survey (NHANES) suggests that both adults and children ages two and older who consume 100% orange juice tend to have significantly greater intake of several key nutrients typically underconsumed by Americans than those who don't consume orange juice, including vitamin C, folate, magnesium, and potassium.^{1,4}

One 8-ounce glass of 100% orange juice helps to fill nutrient gaps and provides an excellent source of vitamin C and a good source of potassium and folate. And, 100% orange juice has no added sugars, sodium, cholesterol or saturated fat.



* Source: USDA National Nutrient Database for Standard Reference, Release 21. NDB 09209. Accessed 10/21/2008. This NDB was missing a value for sugars, therefore sugars amount taken from NDB 09215 - orange juice, frozen concentrate, unsweetened, diluted with 3 volume water. Calcium amount for calcium-fortified orange juice taken from NDB 09210 - orange juice, chilled, includes

from concentrate, fortified with calcium and vitamin D (range from USDA database Releases 20 and 21). Calculated Daily Value (DV) percentages rounded to nearest whole percent. FDA rounding rules for nutrition labeling not applied when calculating percent DV. Percent Daily Value based on a 2,000 calorie diet. Abbreviations: mcg=micrograms; mg=milligrams; IU=International Units.

Vitamin C (137% Daily Value) is a water-soluble vitamin that may help support a healthy immune system. Vitamin C can help collagen production which is important for maintenance of healthy skin, bones, cartilage, muscle and blood vessels.

Thiamin (18% Daily Value) is a water-soluble vitamin associated with the action of many enzyme systems and helps the body process energy from the food we eat.

Potassium (14% Daily Value) is a mineral important for muscle function, nerve transmission, pH maintenance (acid/base balance), and maintaining fluid and electrolyte balance. Potassium may play an important role in cardiovascular health. Diets containing foods that are a good source of potassium and low in sodium may reduce the risk of high blood pressure and stroke.⁵

Folate (11% Daily Value) is a water-soluble vitamin that is important for cell division and the production of healthy red blood cells. Folate is essential for growth and development and, when consumed by women of childbearing age, may help reduce the risk of having a child with birth defects of the brain and spinal cord, known as neural tube defects.

Magnesium (7% Daily Value) is a mineral that helps the body generate energy from the foods we eat and is required for the action of many enzyme systems. Diets rich in fruits and vegetables that provide key minerals such as potassium, calcium, and magnesium may help contribute to the maintenance of healthy blood pressure.⁶ Magnesium may play an important role in bone health, so diets rich in foods with magnesium, such as fruits and vegetables, can help optimize the intake of micronutrients required for bone health.⁷

Vitamin B6 (7% Daily Value), known as pyridoxine, is a water-soluble B vitamin that helps the body process protein and carbohydrates in food. Vitamin B6 helps produce hemoglobin, a part of red blood cells that carries oxygen to all parts of the body.

Vitamin A (4% Daily Value) is a fat-soluble vitamin that's important for good vision and a healthy immune system, and helps form and maintain healthy skin, teeth, skeletal and soft tissue and mucus membranes.

Niacin (3% daily value) is a water-soluble B vitamin that helps enzymes process carbohydrates and fats into energy the body can use.

Calcium (3% Daily Value for non-fortified, 35%-50% Daily Value for fortified) is a mineral that aids in maintaining bone health, bone and tooth development, blood pressure regulation and muscle function.

Iron (2% Daily Value) is a mineral needed for formation of blood cells and many proteins in the body.

Phytochemicals are plant compounds that may provide health-promoting benefits other than those associated with the need for essential nutrients. Although many plants and fruits contain phytochemicals, research is still defining the beneficial roles these components play. Examples of phytochemicals include flavonoids and carotenoids. Hesperidin is the most common flavonoid found in 100% orange juice, which is the only fruit juice or commonly consumed food that contains significant amounts. Emerging research suggests hesperidin may help maintain healthy blood pressure and blood vessel function, two of the key elements in the development of cardiovascular disease.⁸ 100% orange juice contains the carotenoid beta-cryptoxanthin, and is one of the main contributors of beta-cryptoxanthin in the U.S. diet.⁹

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KEY RESEARCH FINDINGS

100% ORANGE JUICE / 100% FRUIT JUICE
consumption by children

The prevalence of childhood obesity has focused increased attention on food and beverage consumption among children, particularly of sugar-sweetened beverages. Nutrient-dense beverages, such as 100% orange juice, can be part of a healthful diet to promote nutrient adequacy and improved diet quality. In fact, the consumption of 100% orange juice has been associated with improved diet quality and nutrient adequacy in children. Unfortunately, media frequently reports misinformation about 100% orange juice and the sugar naturally present in orange juice, which can cause confusion and uncertainty among parents about the healthfulness of consuming 100% orange juice and its role as part of a healthy, well-balanced diet for children.



OVERWEIGHT & OBESITY



The majority of research shows that there is no association between consumption of 100% orange juice/100% fruit juice and overweight or obesity status, BMI, body fat percentage or waist circumference in children.

SYSTEMATIC REVIEWS AND CROSS SECTIONAL STUDIES

- A systematic review of the association between 100% fruit juice intake and weight in children and adolescents reported that after assessing 21 cross-sectional and longitudinal studies, a majority reported no association between 100% juice intake and adiposity—even when juice was consumed in amounts exceeding current recommendations.¹
- In a study of beverage consumption among children ages 6 to 19 years, researchers report no significant association between BMI and the consumption of citrus juice.²
- In a cross-sectional study using 24-hour diet recalls from NHANES 2003-2006, researchers reported no significant difference in BMI, waist circumference or percentage body fat in children and adolescents who consumed 100% orange juice compared to OJ nonconsumers.³
- Researchers examined data from NHANES 2003-2006 of children two to 18 years and reported that those who consumed 100% orange juice had higher energy intakes than OJ nonconsumers; however, there were no differences in body weight or BMI between these two groups. There was also no significant difference in the risk of being overweight or obese for children who consumed 100% orange juice compared to OJ nonconsumers.⁴
- Researchers analyzed data of adolescents aged 12 to 18 years from NHANES 1999-2002 to investigate the associations between 100% juice consumption, nutrient intake and body weight measures. Findings reported no differences in mean weight measures among adolescents consuming 100% juice compared to those not consuming 100% juice.⁵
- In a cross-sectional study using data from NHANES 1999-2002 for children ages two to 11 years, researchers reported no association between 100% juice consumption and weight status or the likelihood of being overweight.⁶
- Results of a study evaluating beverage intake in school children and adolescents ages seven to 15 years reported that intake of 100% fruit juices was not associated with obesity.⁷
- Researchers evaluated beverage intake among preschool children ages two to five years from NHANES 1999-2002 and reported no association between higher 100% fruit juice consumption and BMI.⁸
- A study examining 100% fruit juice consumption in children ages 12 to 59 months participating in WIC reported no statistically significant relationships between higher fruit juice intake (≥ 12 ounces/day) and obesity or short stature.⁹
- A study of 319 Mexican-American children ages 8 to 10 years living in northern California reported no association between 100% fruit juice intake and obesity.¹⁰

LONGITUDINAL STUDIES

- Researchers assessed the association between growth parameters and fruit juice intake in preschool children ages 24 to 36 months and reported no statistically significant differences in children's height, BMI or ponderal index related to fruit juice intake.¹¹
- A longitudinal study of 72 children ages 2 to 6 years reported no statistically significant associations between juice intake and children's height, weight or BMI. Researchers also noted that as juice consumption decreased, intakes of less nutritious beverages increased.¹²
- The association between the consumption of fruit juice, anthropometric indices and the overall diet was examined during a three-year period in a group of healthy preschool children participating in the Dortmund Nutritional Anthropometrical Longitudinally Designed (DONALD) Study. Growth velocity, BMI and height standard deviation scores were not correlated with fruit juice consumption.¹³
- Based on food frequency questionnaires for a large sample (n=14,918) of children and adolescents in the United States from 1996 to 1999, researchers reported no association between intake of 100 percent juices and changes in BMI.¹⁴
- In a longitudinal study using data from the National Heart, Lung and Blood Institute Growth and Health Study for girls ages nine to 19, researchers reported no association between 100% fruit juice consumption and BMI.¹⁵
- In children ages two to five years participating in the North Dakota WIC program, researchers reported no association between fruit juice intake and changes in weight or BMI over a one year period.¹⁶

"OJ consumption was associated with healthier body composition (lower BMI, WC (waist circumference) and body fat %) in adults, and there were no significant associations between OJ consumption and body composition in children and adolescents."³

Wang et al.
Public Health Nutr, 2012

"Inclusion of fruit juice, in amounts consistent with dietary recommendations, as part of a healthy diet can provide important nutrients without increasing weight in children."⁵

O'Neil et al.
Am J Health Promot, 2010

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ABBREVIATIONS

- BMI - body mass index
- CDC - Centers for Disease Control and Prevention
- EAR - Estimated Average Requirement
- HEI - Healthy Eating Index
- NHANES - National Health and Nutrition Examination Survey
- WIC - Special Supplemental Nutrition Program for Women, Infants and Children

NUTRIENT INTAKE AND DIET QUALITY



Scientific evidence supports that consumption of 100% orange juice/100% fruit juice contributes significantly to nutrient intake and can help children meet their fruit intake recommendations as a complement to whole fruit.

- Researchers evaluated data from NHANES 2003-2006, including children and adolescents ages 4 to 18 years, and reported that fruit servings consumed were positively associated with 100% orange juice consumption, and contributed to helping children and adolescents meet calorie-specific USDA MyPyramid recommendations for fruit. Increased 100% orange juice consumption was also correlated with increased daily intakes of certain micronutrients, antioxidants and phytochemicals.¹⁷
- Researchers examined data from NHANES 2003-2006 of children ages two to 18 years and reported that consumers of 100% orange juice had a higher percentage of the population meeting the EAR for certain nutrients (vitamins A and C, folate and magnesium) and higher intakes of total fruit, fruit juice and whole fruit compared with non-consumers. One hundred percent orange juice consumers had significantly higher HEI-2005 scores compared to nonconsumers. Researchers concluded that moderate consumption of 100% orange juice should be encouraged in children as a component of a healthy diet.⁴
- In a cross-sectional study using data from NHANES 1999-2002, children and adolescents who consumed 100% fruit juice had significantly higher intakes of carbohydrates, vitamins C and B6, folate, potassium, magnesium, and iron and significantly lower intakes of total fat and saturated fatty acids compared to non-consumers. Children ages two to 11 years who consumed 100% fruit juice also had lower intakes of added sugars and discretionary fat, while adolescents ages 12 to 18 years had higher intakes of fiber compared to non-consumers. 100% fruit juice consumers in all age groups had higher intakes of whole fruit compared to nonconsumers.^{5,6}
- Data reporting 100% fruit juice consumption for children and adolescents ages two to 18 years from NHANES 2003-2006 revealed a significantly higher percentage of non-consumers of 100% fruit juice had intakes below the EAR for vitamins A and C, folate, phosphorus and magnesium, while a greater percentage of children and adolescents who consumed 100% fruit juice exceeded the Adequate Intake (AI) for potassium compared with OJ nonconsumers.¹⁸ 100% fruit juice consumers also had higher intakes of total and whole fruit, lower intakes of added sugars, and higher total HEI-2005 scores in all age groups.¹⁸
- The CDC analyzed adolescent beverage habits using data from the 2010 National Youth Physical Activity and Nutrition Study (NYPANS) and noted that along with water, milk and 100% fruit juices are healthful beverage selections and sources of key nutrients.²⁰

"It is critical that parents and older children understand the importance of selecting 100% fruit juice as part of the recommend servings of fruit."¹

O'Neil and Nicklas
Am J Lifestyle Med, 2008

"For both age groups (children and adolescents ages 4 to 18 years), fruit servings consumed were positively associated with orange juice consumption."¹⁷

Yang et al.
J Nutr Educ Behav, 2013

"For children and adolescents, consumption of 100% OJ provided a variety of nutritional and health benefits and should be consumed in amounts appropriate for a child's diet and lifestyle."⁴

O'Neil et al.
Nutr Res, 2011

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