

There's Amazing (Science) Inside Florida Orange Juice

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Citrus Expo

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Nutrition Research



Nutrition Research – In vitro studies

- Attributes:
 - Examines mechanisms on a cellular level
 - Very controlled setting
 - Inexpensive and quick
 - Provides a base for future research
- Challenges:
 - Very limited in scope
 - Doesn't model the complex human body
 - Can't be applied to diet recommendations
- Example:
 - Novel information concerning mechanism of how **sugars** in OJ may be **absorbed** ** BUT ** was an in vitro study that cannot completely and exactly imitate what happens in the human digestive tract.
 - *Effect of the flavonoid hesperidin on glucose and fructose transport, sucrase activity and glycaemic response to orange juice... Kerimi et al.*



Nutrition Research – Animal studies

- Attributes:
 - Relatively quick and inexpensive
 - Very Controlled setting
 - Examines mechanisms
 - Extend to organs, systems, and disease state
- Challenges:
 - Doesn't necessarily mimic the human body
- Example:
 - Found that **hesperidin** was able to **prevent oxidative stress** associated with **intense exercise** ** BUT ** was in rats and the results may not necessarily relate to how humans would respond.
 - *Protective Effect of Hesperidin on the Oxidative Stress Induced by an Exhausting Exercise in Intensively Trained Rats - Estruel-Amades et al.*



Nutrition Research – Epidemiological (Observational)

- Attributes:
 - Large amount of data (outcomes, participants)
 - Once data is collected, relatively easy to analyze
 - Can be generalized to a larger population
- Challenges:
 - Data is self reported
 - Difficult to account for all lifestyle variables
 - Cannot show cause and effect – only associations
- Example (Cross-sectional):
 - Found that adults who consumed OJ had **better diet quality** and **were less likely to be obese** compared to those who did not drink OJ ** BUT ** was based on information gathered at a single point in time with limited dietary data and could not fully account for other lifestyle factors that might affect the results.
 - *100% Orange juice consumption is associated with better diet quality, improved nutrient adequacy, decreased risk for obesity, and improved biomarkers of health in adults: National Health and Nutrition Examination Survey, 2003-2006 -O'Neil et al.*



Nutrition Research – Human Clinical Trials

- Attributes:
 - Randomized controlled trials (RCTs) are considered the gold standard
 - Directly test a food vs. control
 - Can more closely address cause-and-effect



- Challenges:
 - Expensive
 - Limited number of subjects (issues with generalizability)
 - Ethical limitations
 - Results may be influenced by the interindividual variability

- Example:
 - Found that consumption of 500 ml OJ daily for 4 weeks **increased skin blood flow** and **reduced diastolic blood pressure** ** BUT ** study only had 24 people and all were overweight men age 51-63 years old so not generalizable to the population. Study only lasted for 4 weeks.
 - *Hesperidin contributes to the vascular protective effects of orange juice: a randomized crossover study in healthy volunteers - Morand et al.*

Nutrition Research - Systematic Review/Meta-Analysis



- Attributes:
 - Review the body of literature (multiple studies on a topic)
 - Followed a designed set of rules for identifying and selecting studies for review
 - Pool results of different studies and statistically analyze as one giant study
 - Can more easily generalize results
- Challenges:
 - Studies have differences that need to be accounted for
 - There must be multiple, strong studies on a specific topic
- Examples:
 - Systematic review of 22 studies between 2005-2013, concluded there are **no significant independent effects of 100% juice on weight status** apart from energy intake. Children who consume 100% fruit juice **have higher intakes and adequacy** of vitamin A, vitamin C, magnesium, potassium, and higher intake of fiber and iron than non-consumers.
 - *Impact of 100% Fruit Juice Consumption on Diet and Weight Status of Children: An Evidence-based Review.* - Crowe-White et al.

How is this type of general nutrition research used:

Inform Policy

- Dietary Guidelines for Americans
 - Educate the general public
 - Shape the school breakfast/lunch programs
- Women, Infants and Children Program

Educate/Communicate to Health Professionals

- Registered Dietitians
- Physicians
- Nurse Practitioners

Orange Juice Research



100% Orange Juice – A Nutrient Dense Beverage

Excellent Source:

Vitamin C

Calcium, Vitamin D (fortified)

Good Source

Potassium

Folate

Thiamin

Vitamin B6

Lesser Amounts (<10% Daily Value):

Magnesium

Riboflavin

Niacin

Vitamin A

Phytonutrients:

Flavonoids

- **Hesperidin** – unique to citrus
- Naringenin

Carotenoids

- Beta-carotene
- Alpha-carotene
- Beta-cryptoxanthin
- Lutein
- Zeaxanthin



8 oz.
serving

Bioactives: Polyphenols

Polyphenols are associated with benefits seen with cocoa/chocolate, red wine, green tea, grape seeds and skin



Red Wine
Resveratrol



Green Tea
Catechin



100% Orange Juice
Hesperidin

Hesperidin plays a valuable role in the overall benefits of 100% orange juice and may play a positive role in:

- Antioxidant activities
- Anti-inflammatory processes
- Heart and vascular health
- Glucose metabolism
- Cognition

OJ is the only commonly consumed food that is a **SIGNIFICANT SOURCE OF HESPERIDIN**



Research Supporting Health Benefits



Heart Health

100% OJ consumption has been associated with favorable effects on several markers of cardiovascular health, including blood lipids, blood pressure, blood vessel function, and inflammatory and oxidative stress markers.



Brain Health

Flavonoids and hesperidin in oranges may help maintain cell health in brain tissue. These flavonoids are able to cross the blood-brain barrier, which the body uses to protect the brain from harmful agents.



Blood Sugar

Clinical studies across various ethnicities show 100% OJ has no association with fasting glucose, insulin levels, insulin resistance, or other markers for Metabolic Syndrome

Research Supporting Health Benefits



100% OJ Drinkers typically have higher diet quality and increased levels of key nutrients

NHANES 2003-2006 Analysis. 100% OJ drinkers are more likely to meet their EAR/AI, have higher fiber and whole fruit intake, higher healthy eating index scores, meet fruit recommendations, lower risk of Metabolic Syndrome (men) and lower total LDL cholesterol



100% OJ has No Association with Weight Gain

NHANES 2003-2006 Analysis. 100% OJ adult drinkers have lower BMI, waist circumference, % body fat. Evidence does not support an association between 100% fruit juice consumption and weight status in children.



100% OJ is a source for hydration and rehydration after workouts

100% OJ may be a good beverage of choice to support fluid balance as it ranked higher than many other beverages on several measures of hydration in a recent study.

Communicating the Research



The Complete Package

- Counts as a fruit serving
- Nutrient dense
- Bioactives (polyphenols)
- No added sugar
- Health benefits
- Not associated with weight gain
- Taste and convenience



2018-2019 Methods to Reach Consumers



Influencers



Paid/Digital Media



Earned Media



Website



Social Media



Content



Events



OJ Nutrition Website: Floridajuice.com

Florida OJ Health Benefits

Drinking Florida Orange Juice is not only delicious, it delivers a powerful combination of nutrients, vitamins, and antioxidants that have proven health benefits. From helping to reduce the risk of kidney stones to fighting inflammation, Florida Orange Juice is an excellent choice for overall health. See below to learn more about the benefits Florida Orange Juice provides:

- Cardiovascular Health >**
The nutrients and vitamins found in 100% orange juice play a role in maintaining a healthy heart.
- Immune System Support >**
The vitamins and minerals found in 100% orange juice support a healthy immune system.
- Skin Health >**
The nutrients and antioxidants found in 100% orange juice can help you maintain healthy skin.
- Iron Absorption >**
100% orange juice may help your body absorb iron and other nutrients from foods.
- Cognitive Function >**
The nutrients and plant compounds in 100% orange juice may have positive effects on brain function.
- Respiratory Health >**
100% orange juice contains essential nutrients that may improve asthma symptoms.
- Kidney Health >**
100% orange juice is one best juices to drink that may reduce the risk of kidney stones.
- Bone Health >**
One 8-ounce glass of 100% orange juice fortified with calcium and vitamin D provides nutrients that may help maintain strong bones.
- Inflammation and Oxidative Stress >**
100% orange juice has an array of nutrients with antioxidant powers.

Nutrition Website: Weight Management

Detailed Nutrition Information

100% Orange Juice and Weight in Adults

Clinical studies have reported that 100% orange juice intake had no negative effects on BMI, waist circumference, body weight or body composition in adults (including large amounts of approximately 25 to 33 ounces per day for four to 12 weeks).⁵⁻¹⁰ In fact, men and women who consumed orange juice were reported to have a lower BMI and were 21 percent less likely to be obese compared to adults not consuming orange juice.⁴

References

1. USDA/DHHS. 2015-2020 Dietary Guidelines for Americans. <http://health.gov/dietaryguidelines/2015/guidelines>
2. O'Neil et al. *Nutr Res* 2011;31:673-682.
3. Wang et al. *Pub Health Nutr*. 2012; 15(12):2220-2227.
4. O'Neil et al. *Nutr J*. 2012 Dec 12;11:107.
5. Cesar et al. *Nutr Res*. 2010a;30(10):689-694.
6. Basile et al. *Proc Fla State Hort Soc*. 2010;123:228-233.
7. Morand et al. *Am J Clin Nutr*. 2011;93(1):73-80.
8. Simpson et al. *Food Funct*. 2016; Apr;7(4):1884-91.
9. Foroudi et al. *J Medicinal Food*. 2014; 17(5):612-617.
10. Asgary et al. *ISRN Nutr*. 2014;405867.
11. O'Neil et al. *Am J Health Promo*. 2010;24(4):231-237.
12. Evidence Analysis Library (EAL), Academy of Nutrition and Dietetics. Dietary and Metabolic Impact of Fruit Juice Consumption Evidence Analysis Project. www.evidenceanalysislibrary.com/2014.
13. Crowe-White et al. *Crit Rev Food Sci Nutr*. 2016;56(5):871-884.
14. Auerbach et al. *Pediatrics*, 2017; 139(4):e20162454.
15. O'Neil et al. *Am J Lifestyle Medicine*. 2008; 2(4):315-354.
16. Rampersaud. *Food Sci*. 2007;200772(4):S261-266.
17. Heyman et al. *Pediatrics*. 2017;;139(6):e20170967.



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TERMS & CONDITIONS

PRIVACY POLICY

ABOUT

OPEN GOVERNMENT

ACCESSIBILITY

INSPECTOR GENERAL

NON-DISCRIMINATION STATEMENT

EEO AGENCY

Weight

Impact of 100%

Florida Orange Juice has no added sugars, and Americans recognize it as a healthy choice to maintain a healthy weight.

Studies report that 100% orange juice compared to other beverages had no effects on BMI, waist circumference, or body weight.

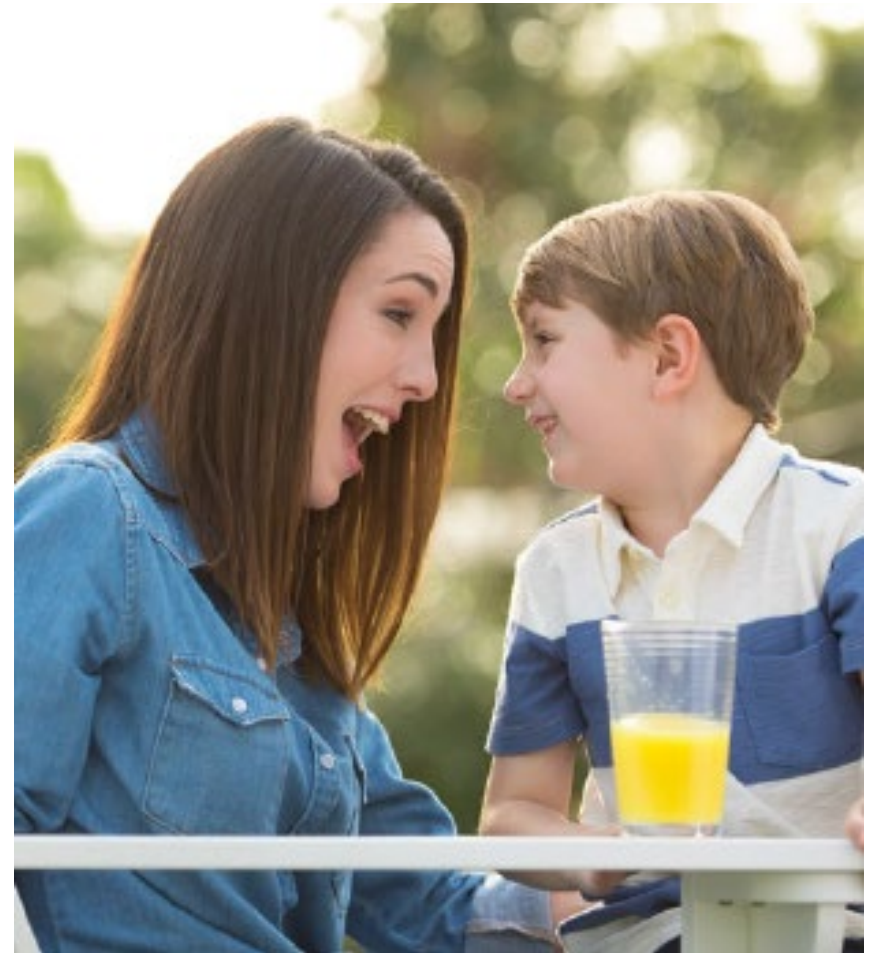
100% Fruit Juice

Multiple systems of management issues.

many commonly consumed fruit juices AND has fewer calories.^{15,16}

Promoting Informed Healthy Choices

- Balanced, healthy eating with more fruits and vegetables
- Focus on nutrient-dense foods, such as 100% OJ
- Including OJ in the diet can help meet daily fruit intake, improve health and diet quality



Future Research at the DOC



Ongoing and New Research

- Longitudinal analysis of children and OJ consumption as related to weight, health measures, activity and diet quality
- NHANES analysis on OJ consumption and its effect on weight and diet quality in adults and children
- NHANES study of trends relating to OJ consumption and nutrient adequacy in adults and children over time

Criteria for projects moving forward

- Produce useful data/information to be leveraged by FDOC's Global Marketing Department in order to:
 - Support nutritional benefits of OJ
 - Support health benefits associated with OJ consumption
 - Counteract negative media coverage
- Support research studies to:
 - Review and strengthen existing research
 - Fill gaps in existing research and literature
 - Support and advise nutrition policy as related to orange juice

Summary

- Nutrition research is evolving, varied and not without challenges and is used to inform national nutrition policy.
- OJ is a source of necessary vitamins and minerals and is one of the only commonly consumed foods containing hesperidin, a polyphenol with antioxidant properties and other benefits.
- FDOC relies on OJ research to develop and support communication and marketing strategies that encourage consumption and promote the positive aspects of drinking OJ.
- FDOC continues to plan and fund as well as promote and support nutrition research, which is instrumental in keeping the conversation around OJ current, relevant, and engaging.

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FloridaJuice.com

