

FRUIT JUICE ACROSS THE LIFECYCLE: ADOLESCENTS

KEY POINTS

- A daily glass of 100% juice can help adolescents achieve fruit guidelines.
- A 150 ml glass of orange juice contains 55-78% of the Adequate Intake¹ (AI) for vitamin C and 10-12% of the AI for folate.
- Vitamin C improves non-haem iron absorption, helping to support normal iron status.
- 100% fruit juice is a source of fluid, contributing to normal hydration.



NUTRITION REQUIREMENTS AND CHALLENGES

According to the WHO, adolescents typically have the least healthy diets of any age group.² Increased requirements for growth combined with reduced parental control create a gap between nutritional needs and intakes. This is also the time when breakfast skipping, alcohol use and sugar-sweetened soft drink consumption peak. Dietary issues include:

Rapid growth – Adolescents go through a major growth spurt, while peak bone mass is reached in the late teens or early twenties. Brain and emotional development may increase the need for minerals, such as iodine and calcium, and long chain omega-3 fatty acids.

Extreme eating habits – Breakfast skipping, veganism, faddy weight loss diets and very high protein diets for muscle gain are all more common in adolescence and may lead to sub-optimal nutrient intakes if not handled correctly.

Early pregnancy – A small proportion of adolescent girls become pregnant, which increases their nutritional requirements at a time when they are reaching full growth themselves.

Sport and performance – Many adolescents participate in regular sport and exercise, which adds to their nutritional needs.

Low fruit intakes – A large international study of nearly half a million young people³ revealed that, while fruit and vegetable consumption was slowly improving in many European countries, intakes were still far too low. Daily fruit consumption ranged from 15% to 49% of recommendations, while daily vegetable consumption ranged from 20% to 55%.

100% FRUIT JUICE: BENEFITS FOR ADOLESCENTS

100% 'pure' juice is made by squeezing or crushing fruit. This means that the nutritional composition reflects that of the fruit used in the processing. Nutrient values are similar whether juice is 'from concentrate' or 'not from concentrate'. It is prohibited by European law to add sugars to 100% fruit juice regardless of the production method.⁴ 100% fruit juices are not the same as juice drinks or soft drinks, which may contain added sugar or artificial sweeteners.

The nutritional composition of 100% orange juice per 100 ml is shown below. One 150 ml glass contains 60 kcal (calories), 13.6 g of naturally occurring sugars and 55 mg of vitamin C. Values in blue represent official 'source of' claims that can be made on pack.

Nutritional composition of 100% orange juice per 100 ml

Energy	41 kcal
Calcium	11 mg
Iron	0.2 mg
Magnesium	9.5 mg
Phosphorus	15.3 mg
Potassium	152 mg
Zinc	0.06 mg
Vitamin C	36.4 mg
Thiamin	0.08 mg
Riboflavin	0.02 mg
Niacin	0.29 mg
Folate	21.5 µg
Vitamin B6	0.07 mg
Vitamin B12	0.02 mg
Vitamin A	4.1 µg
Vitamin D	0.0 µg
Vitamin E	0.18 mg
Vitamin K	0.08 µg

The nutrients found in 100% fruit juice have recognised roles in supporting normal health, as per EU authorised health claims.⁵

- Folate supports normal psychological function and immune function, and contributes to a reduction in tiredness and fatigue.
- Vitamin C supports normal teeth, skin and gums, and supports bone health by contributing to normal collagen. Vitamin C also increases iron absorption.
 - Adolescent girls may have low iron intakes and poor iron status leading to an increased risk of iron deficiency.⁶
- Potassium contributes to normal functioning of the nervous system and supports normal muscle function and blood pressure.

In the body, 100% fruit juice behaves differently to sugar-sweetened soft drinks in terms of glycemic control, so it is not correct to classify them in the same way. Evidence from randomised controlled trials shows that:

- 100% orange juice has a similar glycemic index (GI) to whole oranges (50 versus 43) and both are classed as low GI.⁷ In addition, 100% fruit juice has no significant impact on glucose control, insulin sensitivity or risk of type 2 diabetes according to a meta-analysis.⁸

- 100% orange juice has significantly more favourable effects on fat mass and glycemic control than a sugar-sweetened soft drink.⁹
- 100% orange juice has no impact on body weight or fat when consumed daily.¹⁰ There is no evidence that 100% fruit juices contribute to obesity in children or adolescents.

INCLUDING FRUIT JUICE IN THE DIET

The American Academy of Pediatrics¹¹ advises that older children and adolescents (7-18 years of age) can drink up to 235 ml of pure fruit juice daily.

Depending on your country's guidelines, a serving of 100% fruit juice can be 150-235 ml per day and counts towards official fruit and vegetable targets. It has been calculated that fruit intakes would increase by 51% if European adolescents drank one small glass of 100% fruit juice daily.¹²

Since vitamin C enhances the bioavailability of non-haem iron (for example from fortified foods, supplements and green leafy vegetables)¹³, fruit juice is best consumed with a meal. This can also minimise any potential impact on tooth enamel.

Fruit juice is 90% water and can contribute towards fluid requirements, thus supporting normal hydration. It is nutritionally beneficial to encourage adolescents to switch from sugar-sweetened soft drinks and energy drinks to a daily small glass of 100% fruit juice.

TIPS FOR PATIENTS

Fruit Juice Matters has created a linked one-page leaflet, **Why fruit juice? FOR ADOLESCENTS**, which you may find useful to give to your patients. Click [here](#) to download a copy.

Disclaimer: Every effort has been made to ensure that the information contained in this document is reliable and has been verified. The information is intended for non-commercial communication to health care professionals only. The information given in this dossier does not constitute dietary advice.

1. Adequate Intake for vitamin C is 70 mg for 11-14-year-olds and 100 mg for 15-17-year-olds; Adequate Intake for folate is 270 µg for 11-14-year olds and 330 µg for 15-17-year-olds.
2. WHO (2016) http://www.euro.who.int/__data/assets/pdf_file/0006/303477/HBSC-No.7_factsheet_Diet.pdf?ua=1.
3. Vereecken C et al. (2015) Fruit and vegetable consumption trends among adolescents from 2002 to 2010 in 33 countries. *Eur J Pub Health* 25: 16-19.
4. European Parliament and of the Council (2012) Fruit juice directive. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:115:0001:0011:EN:PDF>.
5. EU register of authorised health claims http://ec.europa.eu/food/safety/labelling_nutrition/claims/register/public/?event=register.home&CFID=289871&CFTOKEN=412e98b139a96490-3D871B69-99EF-047F-75B17F49E11D55B4.
6. National Diet and Nutrition Survey (2016) London: Food Standards Agency/Public Health England.
7. Atkinson RD et al. (2008) International Tables of Glycemic Index and Glycemic Load Values. *Diabetes Care* 31: 2281-2283.
8. Murphy MM et al. (2017) 100 % fruit juice and measures of glucose control and insulin sensitivity: a systematic review and meta-analysis of randomised controlled trials. *J Nutr Sci* 6: e59 (15 pages).
9. Büsing F et al. (2018) High intake of orange juice and cola differently affects metabolic risk in healthy subjects. *Clin Nutr* in press.
10. Ribeiro C et al. (2017) Orange juice allied to a reduced-calorie diet results in weight loss and ameliorates obesity-related biomarkers: a randomized controlled trial. *Nutr* 38: 13-19.
11. Heyman MB et al. (2017) Fruit juice in infants, children and adolescents: Current recommendations. *Pediatr* 139: e20170967.
12. Fruit Juice Matters (2016) The place of fruit juice in European food-based dietary guidelines. <https://fruitjuicematters.nl/files/attachments/.84/Rapport-over-de-verschillen-binnen-Europese-landen-in-de-voedingsrichtlijnen-voor-de-consumptie-van-groente-en-fruit.pdf>.
13. EFSA (2015) Scientific Opinion on Dietary Reference Values for iron. *EFSA J* 13:4254, 115 pp.