

FRUIT JUICE ACROSS THE LIFECYCLE: CHILDREN

KEY POINTS

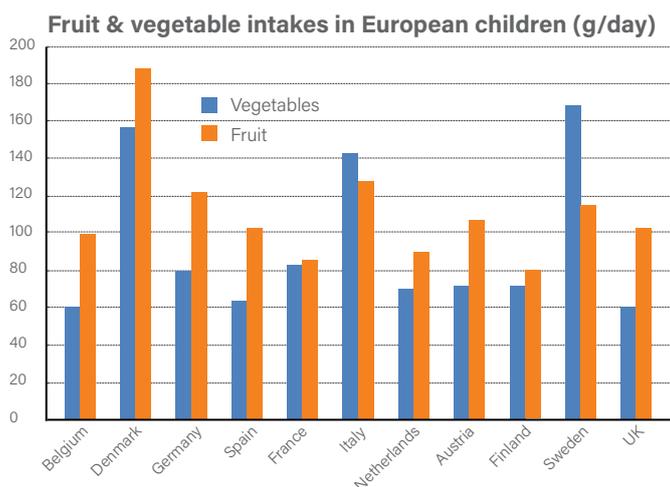
- Easy way for children to consume vitamins and minerals.
- A daily glass of 100% juice can complement fruit targets.
- A 150 ml glass of orange juice contains 121-182% of the Adequate Intake¹ (AI) for vitamin C and 16-23% of the AI for folate.
- Vitamin C improves non-haem iron absorption, helping to support normal iron status.
- 100% fruit juice is a source of fluid, contributing to normal hydration.



NUTRITION REQUIREMENTS AND CHALLENGES

Childhood is the period from late infancy to the beginning of adolescence. During this time, children increase their repertoire of foods and drinks, improving the variety and options for nutritional intake. This is necessary for growth, mental development and social/cultural development. Dietary issues include:

Low fruit intake – European surveys² suggest that fruit and vegetable intakes are low across the board amongst children and young people compared with population recommendations of 400-500 g per day. As shown in the chart below, intakes also vary considerably between countries. The WHO³ reported that, on average, less than half of children eat fruit on a daily basis. A small glass of 100% fruit juice counts as a portion of fruit in many countries.



Fussy eating – While most children eat too few fruits and vegetables, this is especially the case for preschool children and those who are picky/fussy eaters or food neophobic. These groups also tend to have diets that are lower in vitamin C.⁴ For fussy eaters who are reluctant to eat whole fruits or vegetables, 100% juices can offer an alternative source of vitamins and minerals. For example, a small glass of orange juice (150 ml) provides the European daily vitamin C requirement for children.⁵

Poor iron status – A review⁶ of 44 studies conducted in 19 European countries found that, while average iron intakes in babies and toddlers were close to recommended values, significant proportions of children had inadequate intakes, ranging from 10% in the Netherlands up to 50% in Austria, Finland and the United Kingdom. Prevalence of iron deficiency was around 5% in Western Europe but up to 50% in Eastern Europe.

Constipation – The North American Society of Pediatric Gastroenterology, Hepatology and Nutrition guideline on constipation suggests taking advantage of the sorbitol content of certain juices for managing the risk of constipation in children. Prune, pear and apple juices may help increase the frequency and water content of stools for young children with constipation.⁷

100% FRUIT JUICE: BENEFITS FOR CHILDREN

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.⁸ 100% 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 in Europe.

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.⁹

- Folate supports normal psychological function and immune function.
- Vitamin C supports normal teeth, skin and gums and supports bone health by contributing to normal collagen. Vitamin C also increases iron absorption from non-haem sources such as green leafy vegetables and fortified foods.

- 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 in children suggests that:

- 100% fruit juice was not associated with any change in body mass index z-scores in children aged one year and above in a review of eight prospective cohort studies involving more than 34,000 children.¹⁰
- Consuming 100% orange juice relates to a higher intake of vitamin A, vitamin C, folate and magnesium, according to a secondary analysis of the US NHANES study.¹¹ In addition, there was no difference in risk of obesity in children who consumed fruit juice versus non-consumers. Interestingly, 100% fruit juice consumers had higher fruit intakes and scored better on the Healthy Eating Index 2005.

INCLUDING FRUIT JUICE IN THE DIET

The American Academy of Pediatrics¹² advises that children older than one year can drink 100% fresh or reconstituted fruit juice daily as part of a healthy diet. The adequate daily amounts are noted in the table below. In many European countries, 100% fruit juice is recognised as complementary to population fruit and vegetable targets.

1-3 years	100 ml
4-6 years	100-150 ml
7-18 years	up to 235 ml

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 and is the preferred option for dentists.

TIPS FOR PATIENTS

Fruit Juice Matters has created a linked one-page leaflet, **Why fruit juice? FOR CHILDREN**, 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 30 mg for 4-6-year-olds and 45 mg for 7-10-year-olds; Adequate Intake for folate is 140 µg for 4-6-year-olds and 200 µg for 7-10-year olds.
2. EU Science Hub (2016) Fruit and vegetables. https://ec.europa.eu/jrc/en/health-knowledge-gateway/promotion-prevention/nutrition/fruit-vegetables#_who2016a.
3. WHO (2016) World Health Organization WHO Regional Office for Europe, Growing up unequal: gender and socioeconomic differences in young people's health and well-being. Health behaviour in school-aged children (HBSC) study: International report from the 2013/2014 survey.
4. Kozioł-Kozakowska A et al. (2017) Prevalence of food neophobia in pre-school children from southern Poland and its association with eating habits, dietary intake and anthropometric parameters: a cross-sectional study. *Pub Health Nutr* 18: 1-9.
5. EFSA (2013) Dietary Reference Values for vitamin C. <https://efsa.onlinelibrary.wiley.com/doi/abs/10.2903/j.efsa.2013.3418>.
6. Eussen S et al. (2015) Iron intake and status of children aged 6-36 months in Europe: a systematic review. *Ann Nutr Metab* 66: 80-92.
7. Baker SS et al. (1999) Constipation in infants and children: evaluation and treatment. A medical position statement of the North American Society for Pediatric Gastroenterology and Nutrition. *J Pediatr Gastroenterol Nutr* 29: 612-626.
8. 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>.
9. 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.
10. Auerbach BJ et al. (2017) Fruit juice and change in BMI: A meta-analysis. *Pediatr* 139: e20162454.
11. O'Neil CE et al. (2011) One hundred percent orange juice consumption is associated with better diet quality, improved nutrient adequacy, and no increased risk for overweight/obesity in children. *Nutr Res* 31: 673-82.
12. Heyman MB et al. (2017) Fruit juice in infants, children and adolescents: Current recommendations. *Pediatr* 139: e20170967.
13. EFSA (2015) Scientific Opinion on Dietary Reference Values for iron. *EFSA J* 13:4254, 115 pp.