

HOW TO SUPPORT A HEALTHY GUT IN CHILDREN?

- ✓ Gut health can be defined as a state of well-being and absence of gastro-intestinal distress ⁽¹⁾
- ✓ It is influenced by numerous factors, including the gut microbiota
- ✓ To find out more, have a look at our infographic on the importance of gut health in children

A closer look at diet and lifestyle factors that influence gut health in children

0-6 months

Breastfeeding

Human milk contains beneficial elements for the intestinal microbiota, such as human milk oligosaccharides, which stimulate the growth of gut microbiota bacteria such as *Bifidobacterium* and *Lactobacillus* ⁽²⁾



- Exclusive breastfeeding should be promoted for at least **4 months** ⁽³⁾
- Exclusive or predominant breastfeeding is a desirable goal for approximately **6 months** ⁽³⁾

(1) Bischoff SC. 'Gut health': a new objective in medicine? *BMC Med.* 2011;9:24. doi:10.1186/1741-7015-9-24

(2) Goulet O. Potential role of the intestinal microbiota in programming health and disease. *Nutr Rev.* 2015;73 Suppl 1:32-40. doi:10.1093/nutrit/nuv039

(3) Fewtrell M, Bronsky J, Campoy C, et al. Complementary feeding: a position paper by the European Society for Paediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN) Committee on Nutrition. *J Pediatr Gastroenterol Nutr.* 2017;64(1):119-132. doi:10.1097/MPG.0000000000001454

6 months - 2 years

Complementary feeding

Around the age of 6 months, an infant's need for energy and nutrients starts to exceed what is provided by breast milk, and complementary foods are necessary ^(3,4). Introducing solid foods alongside breastmilk or infant formula, will help gastrointestinal maturation which is driven by the type of foods ingested: exposure to solids, transition from a high-fat, human milk or formula-based diet, to a high-carbohydrate diet ⁽³⁾



- When possible, frequent, on-demand breastfeeding until **2 years** of age or beyond is recommended ⁽³⁾
- Complementary feeding can be started after **4 months** and no later than **6 months**, by introducing small amounts of food, to be increased gradually as the child ages

The frequency of meals should also increase as the child age:

2-3 meals/day for infants of 6-8 months

3-4 meals/day for infants of 9-23 months

Plus, 1-2 additional snacks as required ⁽⁴⁾



(3) Fewtrell M, Bronsky J, Campoy C, et al. Complementary feeding: a position paper by the European Society for Paediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN) Committee on Nutrition. *J Pediatr Gastroenterol Nutr.* 2017;64(1):119-132. doi:10.1097/MPG.0000000000001454

(4) WHO, Infant and young child feeding, factsheet. (2020). [https://www.who.int/news-room/fact-sheets/detail/in\[1\]fant-and-young-child-feedin](https://www.who.int/news-room/fact-sheets/detail/in[1]fant-and-young-child-feedin). Accessed June 23, 2021.

Food diversity and healthy hydration for a healthy gut in children

Food diversity has been associated with strengthening learning potential and well-being in children and adolescents. To foster healthy growth and improve cognitive development, children's nutrition should be a variety of adequate, safe and nutrient-dense complementary foods. This reduces the risk of becoming overweight or obese and developing noncommunicable diseases later in life ⁽⁵⁾

To promote diet diversity in children:



Increase the consumption of fruit and vegetables to ensure an adequate daily intake of dietary fibre ⁽⁵⁾



Shift total fat intake away from saturated fats and trans-fatty acids, as well as limit free sugar and salt consumption ⁽⁵⁾

Meals combining fibers and live bacteria on the same plate are ideal options to promote a healthy gut in children



What about a healthy, tasty and colorful breakfast bowl?

- Wholegrain cereals for longer lasting energy and fiber
- Fruits for vitamins and minerals
- Nuts and seeds for antioxidants, poly-unsaturated fats and fat-soluble vitamins (A, E, K)
- Plain yogurt for protein, calcium, phosphorus, vitamin B12 and live bacteria

Maintaining adequate fluid intake is important for children:

for physiological reasons and for the adoption of healthy, sustainable drinking habits. Yet, surveys suggest that the majority of children do not drink sufficiently, particularly at school ⁽⁶⁾



1/4 of children worldwide drink less than a glass of water per day ⁽⁷⁾

- Offer water regularly to children throughout the day without relying on them to signal their thirst
- Associate water intake with "moments" such as wake up, breakfast, morning and afternoon breaks
- Make water accessible to children at all times by using age-appropriate cups

+2 years

(5) WHO. Regional Office for the Eastern Mediterranean. Healthy diet. (2019). <https://apps.who.int/iris/handle/10665/325828>

(6) Bottin JH, Morin C, Guelinckx I, Perrier ET. Hydration in children: what do we know and why does it matter? *Ann Nutr Metab.* 2019;74 Suppl 3:11-18. doi:10.1159/000500340

(7) Iglesia I, Guelinckx I, De Miguel-Etayo PM, et al. Total fluid intake of children and adolescents: cross-sectional surveys in 13 countries worldwide. *Eur J Nutr.* 2015;54 Suppl 2(Suppl 2):57-67. doi:10.1007/s00394-015-0946-6

Environment, family and children's behavior may also influence gut health

Family and psychosocial environment

Recent research suggests that certain gut microbiota compositions have been associated with specific behaviour patterns during child development. Findings suggest that the relationships within the family, the child's food intake and eating behaviours may influence the gut microbiota⁽⁸⁾

4 approaches

to build healthy eating habits in children and support healthy gut development⁽⁹⁾

- ✓ **Positive parental feeding**
(such as avoiding restriction, promoting independent food choices and letting the child limit their portion size)
- ✓ **Eating and sharing the same meal and foods together**
- ✓ **Healthy home food environment**
- ✓ **Pleasure of eating**

Role modeling

Children learn by mimetism of their environment. Parents and grown-ups are important role models⁽¹⁰⁾



Children with water-drinking parents are **38%** more likely to drink water



Children from households where sodas are often consumed are **3-times** more likely to also drink sodas than other children

(8) Flannery JE, Stagaman K, Burns AR, et al. Gut feelings begin in childhood: the gut metagenome correlates with early environment, caregiving, and behavior. *mBio*. 2020;11(1):e02780-19. Published 2020 Jan 21. doi:10.1128/mBio.02780-19

(9) Haines J, Haycraft E, Lytle L, et al. Nurturing children's healthy eating: position statement. *Appetite*. 2019;137:124-133. doi:10.1016/j.appet.2019.02.007

(10) NHC Dr Emma Derbyshire Report: "Drink as I do" The influence of parents' drink choices on children. 2016. NHC_Drink-as-I-do-report_Final.pdf (naturalhydrationcouncil.org.uk). Accessed June 23, 2021.

Medications

When children get sick, antibiotics or PPI (Proton Pump Inhibitors) may be prescribed to treat certain diseases. On the downside, they may have an impact on the gut microbiota and gut health.

Antibiotics

are prescribed to kill harmful bacteria, but they also affect the beneficial ones



Antibiotic treatment, especially if repeated during the first years of life can induce transient and sometimes persistent alterations to the adult gut microbiota called **dysbiosis** ⁽¹¹⁾



Appropriate testing to diagnose whether infections are viral or bacterial can help optimise antibiotic choice and dosage ⁽¹²⁾

PPI



Research has shown that PPIs have been associated with several health issue risks, including **gastrointestinal infection** and **hyperacidity** after discontinuation ⁽¹³⁾

(11) Gibson MK, Crofts TS, Dantas G. Antibiotics and the developing infant gut microbiota and resistome. *Curr Opin Microbiol.* 2015;27:51-56. doi:10.1016/j.mib.2015.07.007

(12) Le Saux N. Antimicrobial stewardship in daily practice: managing an important resource. *Paediatr Child Health.* 2014;19(5):261-270. doi:10.1093/pch/19.5.261

(13) De Bruyne P, Ito S. Toxicity of long-term use of proton pump inhibitors in children. *Arch Dis Child.* 2018;103(1):78-82. doi:10.1136/archdischild-2017-314026



Constipation

Constipation and being ashamed of talking about toilet issues are common childhood problems. Up to **30%** of children worldwide suffer from constipation, consisting of up to **25%** of pediatric gastroenterology visits ⁽¹⁴⁾

Constipation: education and diet play a role

15%



of the children with chronic defecation problems could be helped with **toilet training** ⁽¹⁴⁾



A **balanced diet** that includes fibers, whole grains, fruits and vegetables, and sufficient water intake helps pass **soft and painless stool** and **avoid constipation** ⁽¹⁴⁾

(14) Nurko S, Zimmerman LA. Evaluation and treatment of constipation in children and adolescents. *Am Fam Physician*. 2014;90(2):82-90.



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