

dietary fats

3. *importance in infant & child nutrition*

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Per kilogram of bodyweight, a toddler (1-4 year old) requires 72 kilocalories compared to an adult typically requiring 30-35 kilocalories, and toddlers have stomachs one third the size of adults (1). Owing to this smaller capacity for food intake and increased energy demands, fats play an integral role in children's diets since they are more energy dense than other macronutrients, providing 9 kilocalories per gram versus protein and carbohydrate which provide 4 kilocalories per gram. As well as providing a good source of energy, fats are also needed for absorption of fat-soluble vitamins, formation of cell membranes and provision of the essential fats omega 3 and 6, which the body cannot synthesise and which contribute to brain and nervous system health.

nutritional requirements

Children 4 years of age and above are recommended to adhere to the same

dietary reference values as adults, aiming to achieve 35% total energy intake from fat and including 6.5% as polyunsaturated fats, 13% as monounsaturated fats and limiting saturated fat intake to 11% of total energy intake (2). For children under 4 years of age, there are no Dietary Reference Values but the Public Health England 'Eatwell Guide' provides a rough framework for those 2 years and older (3). This includes the recommendation to consume small amounts of unsaturated fats and oils and to include low fat dairy. For Early Years settings, separate voluntary guidance applies the DRVs for those 4 years above in the absence of specific recommendations (4). This guidance also recommends that babies and young children under two are given full-fat dairy, such as milk, cheese and yoghurt, to ensure sufficient energy is provided. From 2 years of age, children can move towards having semi-skimmed milk to drink, if a varied and balanced diet is achieved and growth is sufficient, but skimmed milk should be avoided until 5

years of age.

For the first 6 to 24 months of life, research suggests that diets relatively high in fat are not harmful although where more than 50% dietary fat contributes to total energy intake there may be a risk of reduced dietary diversity (5). Conversely, a low fat diet may result in insufficient energy intake. Whilst there are no widely used fat targets for this age group, an EFSA panel recommended that fat should constitute 40% of energy intake from 6 to 12 months and that 35-40% fat contribution is adequate for second and third years of life, based on current levels of intake and achievable dietary patterns (6).

Although difficult to assess, it is thought fat intake of breastfed infants under 6 months is approximately 50-55% total energy (6). Owing to regulation that sets out composition requirements of infant formula, formula is typically composed of 40-50% energy from fat but guidance on what type of fat is used to achieve this target is limited (7). Although widely acknowledged that it is difficult to simulate the chemical composition of breastmilk, infant formula companies are continually trying to better their product in this vein. Recent interest lies in using bovine milk fats alongside the typical vegetable oils that make up the required fat content, given evidence that this may positively influence factors such as night-time discomfort, stool consistency (8) and cognitive development (9), but more evidence is required to advise on their routine use (10).

fat-soluble vitamins

There are two key fat-soluble vitamins when it comes to children's diets, vitamins A & D, since these were identified as at risk of

deficiency in the diets of children in the UK (11). These vitamins require dietary fat for transport into the body.

Vitamin D is integral to calcium and phosphorus metabolism, which are required for bone health. Vitamin A is required for many functions including growth, vision and immune function. In the UK, children under the age of 1 are advised to supplement 8.5-1ug vitamin D daily if breastfed or consuming less than 500ml infant formula per day (12). From 6 months, a vitamin A, C & D supplement is advised until 5 years of age, unless more than 500ml of infant formula is provided (13). Infant formula is fortified with vitamins A, C and D.

A recent review by the Scientific Advisory Committee on Nutrition suggests that intakes of vitamin A may now exceed the tolerable upper limit of intake for some children, and that supplementation may require review (13).

essential fats

The polyunsaturated fats omega-6, linoleic acid, and omega-3, alpha-linolenic acid, are essential in our diets as our bodies can't make them. Important long-chain omega 3 fatty acids are synthesised from alpha-linolenic acid by the body, Eicosapentaenoic acid (EPA) and Docosahexaenoic acid (DHA), the latter of which is needed for normal development of the nervous system, retina and brain.

Owing to the importance of DHA in the developing brain and vision of infants and children, it was made mandatory to fortify infant formula with DHA (7) and it is advised that oily fish, which is the best source of DHA, is included in a child's diet from the



outset of introducing solids. Some evidence suggests that consumption of omega 3 & 6 during weaning influences short-term visual function (6).

It is also advised educational institutions from early years through to adolescents provide at least one portion every three weeks (15,16). Although supplements are not routinely advised for children, some evidence suggests improvements in cognition and behaviour can be seen with DHA supplementation (17) but more research is required in this area.

summary

Children, particularly toddlers, have high energy demands and the energy density of dietary fats means they are key to achieving adequate energy intake. Alongside their energy density, fats are important to children's diets given they are required to transport key vitamins, A & D, and provision of essential fats, omega 3 & 6. In the UK, there is a risk of vitamin D deficiency, but it is likely children receiving an adequately varied diet will not be deficient in vitamin A. Owing to its importance in brain and visual health, oily fish should be included in the diet from weaning.

References

1. Infant & Toddler Forum. Healthy Eating For Toddlers. 2018; Available from: <https://infantandtoddlerforum.org/health-and-childcare-professionals/>
2. Public Health England. Government Dietary Recommendations Government recommendations for energy and nutrients for males and females aged 1 – About Public Health England. 2016;1–12. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/618167/government_dietary_recommendations.pdf
3. Public Health England. Eatwell Guide. 2018; Available from: www.gov.uk/government/publications/the-eatwell-guide
4. Children's Food Trust. Developing new example menus for early years settings in England , to reflect current government dietary recommendations Technical report. 2016;(December).
5. Fewtrell M, Bronsky J, Campoy C, Domellöf M, Embleton N, Mis NF, 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):119–32.
6. EFSA. Scientific Opinion on nutrient requirements and dietary intakes of infants and young children in the European Union. *EFSA J.* 2013;11(10):1–103.
7. Commission TE. COMMISSION DELEGATED REGULATION (EU) 127 / 2015 - of 25 September 2015 - supplementing Regulation (EU) No 609/ 2013 of the European Parliament and of the Council as regards the specific compositional and information require. *Off J Eur Union [Internet].* 2016;L25(609). Available from: [https://eur-lex.europa.eu/legal-content/EN/TX/T/PDF/?uri=CELEX:32016R0127&from=EN&file:///C:/Users/miche/Documents/Citavi6/Projects/Milk_Lokal_210918/Citavi Attachments/Office - COMMISSION DELEGATED REGULATION EU 2016 \(2\).pdf Y3 - 21.12.2020 S1 - 29 M](https://eur-lex.europa.eu/legal-content/EN/TX/T/PDF/?uri=CELEX:32016R0127&from=EN&file:///C:/Users/miche/Documents/Citavi6/Projects/Milk_Lokal_210918/Citavi Attachments/Office - COMMISSION DELEGATED REGULATION EU 2016 (2).pdf Y3 - 21.12.2020 S1 - 29 M)
8. Sheng X et al. Reduced crying and favourable stool characteristics in Chinese infants fed milk fat-based formula. *Asia Pac J Clin Nutr.* 2020;29(1):144–51.
9. Timby N, Domellöf E, Hernell O, Lönnerdal B, Domellöf M. Neurodevelopment, nutrition, and growth until 12 mo of age in infants fed a low-energy, low-protein-formula supplemented with bovine milk fat globule membranes: A randomized controlled trial. *Am J Clin Nutr.* 2014;99(4):860–8.
10. Timby N, Domellöf M, Lönnerdal B, Hernell O. Supplementation of infant formula with bovine milk fat globule membranes. *Adv Nutr.* 2017;8(2):351–5.
11. Department of Health. Weaning and the weaning diet. 1994;(I):114.
12. SACN. Vitamin D and Health 2016. *Vitam D Heal 2016 [Internet].* 2016;56–116. Available from: <https://www.gov.uk/government/groups/scientific-advisory-committee-on-nutrition>
13. SACN. Feeding in the First Year of Life 2018, 2018;271. Available from: <https://www.gov.uk/government/publications/sacn-report-on-feeding-in-the-first-year-of-life>
14. First Steps Nutrition Trust. Eating well: the first year [Internet]. 2015. Available from: www.firststepsnutrition.org
15. Infant & Toddler Forum. Nutrients: Functions, sources and requirements. 2018; Available from: <https://www.gov.uk/government/publications/school-food-standards-resources-for-schools/school-food-standards-practical-guide>
16. Public Health England. Example menus for early years settings in England Part 1 : Guidance About Public Health England. 2017;1–53. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/658870/Early_years_menus_part_1_guidance.pdf
17. Kuratko CN, Barrett EC, Nelson EB, Salem N. The relationship of docosahexaenoic acid (DHA) with learning and behavior in healthy children: A review. *Nutrients.* 2013;5(7):2777–810.



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