# Paediatric update



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**Welcome to our paediatric nutrition column 'Paediatric update'. In each column, Kiran Atwal, Freelance Paediatric Dietitian, will update you on new guidance, tools and current affairs. Here, Kiran explores: *'What happens when the infant gut microbiome is exposed to ultra-processed foods?'***

The first 1,000 days for infants are often cited as the most critical period for establishing the gut microbiome, after which it becomes less modifiable.[1] Described as an 'organ' in itself, the gut microbiome is responsible for a wide range of bodily functions, including digestion, metabolism and immunity, to name just a few.[2] The diversity and composition of the gut microbiota are linked to chronic disease; therefore, modulation is of utmost importance.[3] The mode of delivery, type of milk and use of antibiotics are factors that play a role in gut microbiome development during the first year of life.[1] Little is known about the impact of ultra-processed foods (UPF) during this period. However, a small birth cohort study from Brazil may offer some new insights.[4]

Dietary intake data and stool samples from a birth cohort of 728 children were analysed. At the one-year follow-up, significant differences in gut microbial diversity were found between those who were breastfed and/or never consumed UPF and those who did consume UPF. Results were pronounced in those who consumed two or more UPF daily, especially among those who consumed sweets. Distinct differences in microbial communities included lower levels of Bifidobacterium (beneficial bacteria) and higher levels of Firmicutes (pathogenic bacteria) in the UPF group compared to the breastfed group.[4] This suggests that a lack of breastfeeding and the consumption of UPF during complementary feeding are linked to unfavourable changes in the gut microbiome.

Determining the long-term health implications warrants further research, especially that which addresses some of the drawbacks of this study. Some limitations include a lack of specificity, as the researchers did not perform subgroup analyses on those exclusively breastfed for 6 months, formula-fed, or by other NOVA classifications of food. It is important to note that infant formula, which has been shown to impact the gut microbiota,[5] was not classified as an UPF in this study. Food portion sizes were not collected, as the composition of the diet was measured only by food frequency. Although this study was conducted in Brazil, variations in environmental exposure were observed, as a quarter of the children lived in areas without adequate sewage treatment, potentially influencing gut dysbiosis.[6] Finally, advanced techniques that measure microbial communities were not employed, limiting the reliability of the findings.

This study is one of the few that confirms the crucial role of early-life nutrition in shaping the gut microbiome. The evidence underscores the importance of breastfeeding alongside age-appropriate complementary feeding with unprocessed or minimally processed foods in the first year. This is particularly relevant as many infant weaning products are classified as UPF due to the addition of emulsifiers, additives and other industrial ingredients.

While measurements of the gut microbiome are limited at the population level, the publication of the 2023 Infant Feeding Survey by the Department of Health and Social Care in the UK is eagerly awaited. Gaining insights into the factors that influence dietary choices, such as the level of food security or breastfeeding support, is essential. A better understanding of these drivers may help to develop more realistic and evidence-based strategies to support parents and caregivers in overcoming barriers to healthier infant diets and optimising the gut microbiome, ultimately promoting improved long-term health outcomes.

References: **1.** Gómez-Martín M, *et al.* (2022). Association between diet and fecal microbiota along the first year of life. Food Res Int.; 162(Pt A): 111994. **2.** Turroni F, *et al.* (2020). The infant gut microbiome as a microbial organ influencing host well-being. Ital J Pediatr.; 46(1): 16. **3.** Maynard CL, *et al.* (2012). Reciprocal interactions of the intestinal microbiota and immune system. Nature.; 489(7415): 231-41. **4.** Faggiani LD, *et al.* (2025). Effect of ultra-processed food consumption on the gut microbiota in the first year of life: Findings from the MINA–Brazil birth cohort study. Clin Nutr.; 46: 181-190. **5.** Ma J, *et al.* (2020). Comparison of gut microbiota in exclusively breast-fed and formula-fed babies: a study of 91 term infants. Scientific Reports.; 10(1): 15792. **6.** Singh S, *et al.* (2022). Impact of Environmental Pollutants on Gut Microbiome and Mental Health via the Gut-Brain Axis. Microorganisms.; 10(7): 1457.