

CLINICAL RECOMMENDATIONS FOR REDUCING AND PREVENTING FOOD ALLERGIES

RECENT COURSE UPDATES



Marion Groetch, MS, RDN, CDN, & Hugh A. Sampson, MD

Director of Nutrition Services
Icahn School of Medicine at Mount Sinai

Kurt Hirschhorn Professor of Pediatrics
Icahn School of Medicine at Mount Sinai



How can food allergy management and nutrition be individualized for patients?

The goal of food allergy management in infants and children is both to prevent allergic reactions to foods and to promote health in these populations. An important part of that process is making sure that elimination diets are individualized to avoid excessive avoidance of foods. Except for cases of known cross-reactivity (eg, cashew/pistachio allergy), allergy to 1 food in a species group does not guarantee allergy to another in the same group. For example, patients who are allergic to salmon should not necessarily be advised to avoid all other fish, and those allergic to peanut should not avoid tree nuts.¹ We recommend evaluation of individual tree nuts, fish species and other foods to allow inclusion of all tolerated foods in the diet.²

Nutrition recommendations for complementary feeding should also be individualized according to whether a child is breast fed or formula fed. For example, iron is a critical nutrient in infants 6 to 12 months of age for optimal cognitive development. Infant formulas are supplemented with iron in the US, and formula-fed infants are likely to need less iron from complementary foods. In contrast, breastfed infants will need to be fed sufficient iron-rich foods to ensure adequate iron intake.³

When can a young toddler be transitioned from breast milk or hypoallergenic formula to a plant-based beverage?

World Allergy Organization (WAO) Diagnosis and Rationale for Action against Cow's Milk Allergy (DRACMA) guidelines recommend that children with cow's milk allergy (CMA) continue breast milk or infant formula until 2 years of age.⁴ However, children may be able to safely transition to plant-based beverages earlier. In all children younger than 2 years, a nutrition assessment should be performed prior to transition from breast milk or hypoallergenic formula. Infants who are at least 1 year old may be transitioned if they are...¹

- Eating a diet of solid foods that incorporates various foods from each food group
- Getting at least two-thirds of their calories from solid foods
- Eating age-appropriate textures

- Consuming no more than 16 oz of milk substitute per day (including breast milk, formula, and other dairy substitutes such as plant-based yogurt)
- Getting enough protein, fat, and micronutrients from solid foods and milk substitute

What plant-based beverages are appropriate milk substitutes for toddlers?

Parents should be informed that plant-based beverages, which are often labeled as "milk," have different compositions from cow's milk and may not meet children's nutritional requirements in the absence of a varied diet. For most children, fortified soy milk is a reasonable alternative to cow's milk and may be used as a cow's milk alternative. For families that desire or require alternatives to soy milk, pea protein milk—and possibly oat milk—may be considered, but the nutritional composition of each individual product should be assessed. Due to inadequate levels of protein, fat, and micronutrients, the following plant-based beverages are not recommended as cow's milk substitutes in toddlers: almond, rice, coconut, hemp, flax seed, and cashew milks.⁵

When plant-based beverages are consumed in small amounts by children and not as the primary milk source, the nutritional composition becomes less important.⁵

Have there been any new studies or updates to guidelines regarding the early introduction of allergenic foods besides peanut for the prevention of food allergies?

In 2021, a consensus approach to preventing food allergy through nutrition was developed by the American Academy of Allergy, Asthma, and Immunology (AAAAI); American College of Allergy, Asthma, and Immunology (ACAAI); and the Canadian Society for Allergy and Clinical Immunology (CSACI). These guidelines recommend the introduction of infant-safe forms of peanut protein and cooked egg at around 6 months of age (and not in infants younger than

4 months), regardless of infant risk for development of food allergy. These allergenic foods can be introduced at home when infants are developmentally ready for complementary feeding.⁶

At this time, the only allergenic food that has been proven to induce tolerance with early introduction is peanut, and a meta-analysis of 5 studies with variable outcomes following early introduction of egg suggests that early introduction of egg may also induce tolerance. Parents should also be encouraged to introduce varied and nutritious foods as part of a diverse diet to promote health and immunity. In fact, limited observational data indicate a diverse diet may be associated with a reduced risk of food allergies in infants.⁷

Are there risks associated with early introduction of allergenic foods?

At this time, there are no proven risks of introducing allergenic foods in infants for whom complementary feeding is developmentally appropriate. That said, there are also no proven benefits for early introduction of food allergens outside of peanut and egg.^{6,8}

Furthermore, there is evidence that peanut-induced food protein–induced enterocolitis syndrome (FPIES) cases have increased among infants with early peanut introduction. While these reports are thus far observational and based on case series, it is important to be aware of this trend, particularly given the high rate of misdiagnosis and delayed diagnosis for FPIES.^{9,10}

Furthermore, there has been an increase in peanut and tree nut inhalation among infants since the publication of the LEAP study. {Leung, 2021 #9919} Many infant-safe forms of peanut are available for early introduction and should be discussed with parents when discussing the start of complementary feeding. Instructions for the early introduction of peanut for infants developed by the National Institute of Allergy and Infectious Disease can be found here: https://www.niaid.nih.gov/sites/default/files/addendum_guidelines_peanut_appx_d.pdf

What are your thoughts on commercial allergen introduction products marketed for infant feeding?

There are few benefits and several risks associated with the use of commercial allergen introduction products. A recent study of commercial allergen products showed that the amount of food allergen proteins contained in these products varies widely, from 0.1 to 3 g. In some cases, no food allergen protein from the advertised allergen(s) could be detected in the products.¹¹ In the LEAP and EAT studies, 3 to 6 g of allergenic food proteins were fed per week, and there is no evidence that introduction of levels lower than that can be effective in preventing food allergy.^{12,13} Indeed, it's possible that lower levels of these allergenic proteins may not be enough to induce tolerance but may be enough to sensitize infants to allergens. A recent case series discussed 12 infants from

a single institution who developed food allergy despite the use of commercial allergen introduction products.¹⁴

It should also be noted that these products tend to be more expensive and less nutritious than whole foods eaten as a part of varied complementary feedings.¹⁵

Should food allergen introduction be considered a part of complementary feeding, or is food allergen introduction a separate process?

All foods given to infants, including potential allergens, should be considered as a part of a healthy and varied diet intended to meet the nutritional needs of infants. Peanut can be introduced using peanut flour or peanut butter without added salts, sugar, or fats. Peanut butter must be thinned with water, breast milk, or formula or mixed into pureed foods, with 1 to 2 teaspoonfuls (30-60 kcal) served 2 to 3 times per week. Well-cooked egg can be mashed into pureed foods or served as finger food, with one-third of an egg (26 kcal) fed 2 to 3 times per week. Both peanut and egg provide protein and important nutrients and can be nutritious when served as one of the recommended servings for protein-based foods in the infant diet.¹⁶ Always consider serving variety and a balance of nutritious foods such as fruits, vegetables, meats and other protein foods, and whole grains.¹⁵

You mentioned that some studies like the PEBBLES study would help us to understand the value of skin care in the prevention of food allergy. Are there any updates on this topic?

The results of the PEBBLES study have not yet been released, as the trial is ongoing.¹⁷ However, other data have been made available on this topic in recent years. In the EAT study, 1303 exclusively breastfed 3-month-old infants were enrolled and followed up for several years. In contrast with the hypothesis of the PEBBLES study, the EAT study showed that infants who were frequently moisturized were at higher risk of developing food allergy; for each additional moisturization per week, the risk for developing food allergy increased by 20%. This trend held true regardless of whether the infants had atopic dermatitis. Based on these findings, the researchers suggested that moisturizer application may lead to transcutaneous allergen sensitization and subsequent food allergy.¹⁸ Furthermore, in a recent meta-analysis of 33 studies that enrolled nearly 26,000 infants, moisturizer use did not reduce the risk of atopic dermatitis but did slightly increase the risk of food allergy and skin infections.¹⁹

The primary end point of PEBBLES is expected to be reported in May 2022, so we may have more information on this topic soon.¹⁷ Until that time, caution should be used when recommending moisturizer as a way to prevent allergy, and clinicians should discuss the importance of good hand hygiene prior to moisturizer application with parents.

For more context, watch Ms. Groetch and Dr. Sampson's recorded CE/CME webcast, *Clinical Recommendations for Reducing and Preventing Food Allergies*. It's part of our extensive collection of educational material, *Understanding Food Allergies in Infants and Children*.

GO TO WEBCAST

[PNCE.ORG](https://www.pnce.org)

This material is supported by an educational grant from Mead Johnson Nutrition

 ANNENBERG CENTER
FOR HEALTH SCIENCES
AT EISENHOWER

References

1. Groetch M, Venter C. Nutritional management of food allergies. *Journal of Food Allergy*. 2020;2(2):131-141. doi:10.2500/jfa.2020.2.200032
2. Venter C, Groetch M, Netting M, Meyer R. A patient-specific approach to develop an exclusion diet to manage food allergy in infants and children. *Clin Exp Allergy*. 2018;48(2):121-137. doi:10.1111/cea.13087
3. Caroli M, Vania A, Tomaselli MA, et al. Breastfed and formula-fed infants: Need of a different complementary feeding model? *Nutrients*. 2021;13(11):3756. doi:10.3390/nu13113756
4. Fiocchi A, Brozek J, Schunemann H, et al. World Allergy Organization (WAO) Diagnosis and Rationale for Action against Cow's Milk Allergy (DRACMA) Guidelines. *World Allergy Organ J*. 2010;3(4):57-161. doi:10.1097/WOX.0b013e3181defeb9
5. Merritt RJ, Fleet SE, Fifi A, et al. North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition Position Paper: Plant-based Milks. *J Pediatr Gastroenterol Nutr*. 2020;71(2):276-281. doi:10.1097/MPG.0000000000002799
6. Fleischer DM, Chan ES, Venter C, et al. A consensus approach to the primary prevention of food allergy through nutrition: Guidance from the American Academy of Allergy, Asthma, and Immunology; American College of Allergy, Asthma, and Immunology; and the Canadian Society for Allergy and Clinical Immunology. *J Allergy Clin Immunol Pract*. 2021;9(1):22-43 e24. doi:10.1016/j.jaip.2020.11.002
7. Venter C, Maslin K, Holloway JW, et al. Different Measures of diet diversity during infancy and the association with childhood food allergy in a UK birth cohort study. *J Allergy Clin Immunol Pract*. 2020;8(6):2017-2026. doi:10.1016/j.jaip.2020.01.029
8. Sampath V, Abrams EM, Adlou B, et al. Food allergy across the globe. *J Allergy Clin Immunol*. 2021;148(6):1347-1364. doi:10.1016/j.jaci.2021.10.018
9. Lopes JP, Cox AL, Baker MG, et al. Peanut-induced food protein-induced enterocolitis syndrome (FPIES) in infants with early peanut introduction. *J Allergy Clin Immunol Pract*. 2021;9(5):2117-2119. doi:10.1016/j.jaip.2020.12.023
10. Robbins KA, Ackerman OR, Carter CA, Uygungil B, Sprunger A, Sharma HP. Food protein-induced enterocolitis syndrome to peanut with early introduction: a clinical dilemma. *J Allergy Clin Immunol Pract*. 2018;6(2):664-666. doi:10.1016/j.jaip.2017.06.038
11. Filep S, Chapman MD. Doses of specific allergens in early introduction foods for prevention of food allergy. *J Allergy Clin Immunol Pract*. 2022;10(1):150-158 e153. doi:10.1016/j.jaip.2021.02.051
12. Du Toit G, Roberts G, Sayre PH, et al. Randomized trial of peanut consumption in infants at risk for peanut allergy. *N Engl J Med*. 2015;372(9):803-813. doi:10.1056/NEJMoa1414850
13. Perkin MR, Logan K, Marrs T, et al. Enquiring About Tolerance (EAT) study: Feasibility of an early allergenic food introduction regimen. *J Allergy Clin Immunol*. 2016;137(5):1477-1486 e1478. doi:10.1016/j.jaci.2015.12.1322
14. Cox AL, Shah A, Groetch M, Sicherer SH. Allergic reactions in infants using commercial early allergen introduction products. *J Allergy Clin Immunol Pract*. 2021;9(9):3517-3520 e3511. doi:10.1016/j.jaip.2021.04.068
15. Schroer B, Groetch M, Mack DP, Venter C. Practical challenges and considerations for early introduction of potential food allergens for prevention of food allergy. *J Allergy Clin Immunol Pract*. 2021;9(1):44-56 e41. doi:10.1016/j.jaip.2020.10.031
16. US Department of Agriculture. 2020–2025 Dietary Guidelines for Americans December 2020. Accessed April 7, 2022. https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf
17. The PEBBLES Study - Testing a Strategy for Preventing Eczema and Food Allergy in High Risk Infants (PEBBLES). September 12, 2018. Accessed April 6, 2022. <https://clinicaltrials.gov/ct2/show/NCT03667651>
18. Perkin MR, Logan K, Marrs T, et al. Association of frequent moisturizer use in early infancy with the development of food allergy. *J Allergy Clin Immunol*. 2021;147(3):967-976 e961. doi:10.1016/j.jaci.2020.10.044
19. Kelleher MM, Cro S, Cornelius V, et al. Skin care interventions in infants for preventing eczema and food allergy. *Cochrane Database Syst Rev*. 2021;2(2):CD013534. doi:10.1002/14651858.CD013534.pub2