

# Early exposure to food and food allergy in children

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### Abstract

**Question** I have been under the impression that infants should avoid potential allergenic foods such as nuts, cow's milk, and eggs in order to avoid developing allergic reactions. What advice should I give parents regarding the introduction of food in infancy and the development of food allergy?

**Answer** There is no evidence that delaying the introduction of any specific food beyond 6 months of age helps to prevent allergy. A recent Canadian Paediatric Society statement recommends no delay in the introduction of food in infancy. Recent research also appears to suggest that early introduction of potentially allergenic foods (at 4 to 6 months of age) might actually provide a form of protection and help prevent allergy, but more research is needed.



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Food allergy is a subject of great concern for parents and clinicians caring for children. The incidence of food allergy has increased dramatically over the years, affecting 1% to 10% of children worldwide.<sup>1,2</sup> In the United States, the prevalence of reported food allergy in children younger than 18 years of age increased 18% ( $P < .01$ ) and ambulatory visits caused by food allergy tripled between 1993 and 2006 ( $P < .01$ ).<sup>3</sup> In Canada, the prevalence of food allergy is approximately 7% based on self-reported data.<sup>4</sup> The economic consequences of this health concern are substantial, as the diagnosis and management of food allergy come at a cost to health care systems.

### Delayed introduction of foods

For many years, the prevailing advice for preventing food allergy in infants at high risk (ie, those with first-degree relatives with allergic conditions such as atopic dermatitis, food allergy, asthma, or allergic rhinitis) was to delay introduction of potentially allergenic foods (eg, delay peanut exposure until 3 years of age).<sup>5</sup> However, this advice was based mainly on expert opinion and not evidence-based recommendations. Despite the paucity of evidence for a delay in allergenic food exposure, health care practitioners are still likely to recommend delaying specific foods. A 2012 study using a 9-item questionnaire in British Columbia found that 20 out of 93 surveyed general pediatricians were likely to recommend delaying cow's milk and even more likely to recommend delaying peanuts and eggs beyond 4 to 6 months of age.<sup>6</sup>

Previous recommendations regarding timing of food introduction included delaying foods such as cow's milk protein until 1 year of age, eggs until 2 years of age, and peanuts or seafood until 3 years of age.<sup>5</sup> It was thought that early intestinal exposure to allergenic foods would cause sensitization and subsequent development of allergy. More recently, the "dual-allergen-exposure hypothesis" that has emerged suggests that early cutaneous exposure to food protein through a disrupted skin barrier (ie, eczematous skin) is what leads to allergic sensitization. Furthermore, it is thought that early introduction to some allergenic foods might actually decrease the risk of atopic disease by promoting tolerance through regulatory T-cell pathways and minimize the chance of sensitization through the skin.<sup>1</sup>

### Early introduction of foods

There is a growing body of evidence that early introduction of foods such as peanuts, fish, and eggs (at an appropriate age) might actually be beneficial in preventing food allergy, and that delaying food introduction might contribute to allergic disease. In a 2008 study, the prevalence of peanut allergy was compared between Jewish children in the United Kingdom and Israel. A questionnaire determined that the prevalence of peanut allergy in children ages 4 to 18 was 1.85% in the United Kingdom compared with 0.17% in Israel ( $P < .001$ ).<sup>7</sup> The primary difference in diet was that Israeli children consumed peanuts earlier in life (starting at younger than 1 year of age), at a much more frequent rate, and in substantially higher amounts.<sup>7</sup> A Swedish prospective birth cohort study of 4089 children reported that

eating fish regularly before 1 year of age was associated with a reduced risk of allergic disease and sensitization to food allergens in the first 4 years of life (odds ratio 0.76, 95% CI 0.61 to 0.94).<sup>8</sup> In an Australian study, introduction to eggs at 12 months of age was associated with a higher risk of egg allergy compared with introduction at 4 to 6 months of age (odds ratio 3.4, 95% CI 1.8 to 6.5).<sup>9</sup> At present, there are large randomized prospective studies that have been under way for a few years investigating whether early and regular introduction of food prevents the development of allergy.

## Current recommendations

In 2008, the American Academy of Pediatrics made changes to its previous recommendations by stating that although solid foods should not be introduced before 4 to 6 months of age, there was no convincing evidence that delaying their introduction beyond this period was protective against allergy.<sup>10</sup> This aligned with European guidelines.<sup>11-13</sup>

In 2013, a new joint position statement, "Dietary Exposures and Allergy Prevention in High-Risk Infants," from the Canadian Paediatric Society and the Canadian Society of Allergy & Clinical Immunology was published (Box 1).<sup>14</sup> This position statement suggests that there is no benefit to delaying the introduction of any potentially allergenic food such as milk, eggs, peanuts, or fish beyond 6 months of age to prevent food allergy.<sup>14</sup> It advises against restricting maternal diet during pregnancy and lactation, reiterates the importance of breastfeeding, and gives some guidance for mothers who cannot or choose not to breastfeed.<sup>14</sup>

### Box 1. Recent CPS recommendations

Recent CPS recommendations\* to prevent food allergy include the following:


- No restriction of maternal diet is recommended during pregnancy or lactation (evidence II-2B)
- Exclusive breastfeeding for the first 6 months of life (evidence II-2B)
- Choose a hydrolyzed cow's milk-based formula, if necessary (evidence IB)
- Do not delay the introduction of any specific solid food beyond 6 months of age (evidence II-2B)
- More research is needed on the early introduction of specific foods to prevent allergy (evidence II-2B)
- Regular ingestion of newly introduced foods appears to be important for maintaining tolerance (eg, several times per week in non-choking forms). Routine skin or specific IgE blood testing before first ingestion is discouraged owing to high risk of false-positive results (evidence II-2B)

CPS—Canadian Paediatric Society, IgE—immunoglobulin E.

\*Levels of evidence reported in the recommendations have been described using the evaluation of evidence criteria outlined by the Canadian Task Force on Preventive Health Care.

Data from Chan et al.<sup>14</sup>

## Conclusion

For many years, the prevailing advice to parents regarding the prevention of allergy was to delay the introduction of certain allergenic foods. Current consensus is that there is a lack of evidence for delaying the introduction of food to prevent the development of food allergy. However, the possible protective benefit of introducing solid foods earlier in life is still under investigation and this cannot be routinely recommended at this time. 

### Competing interests

None declared

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