

Practice Guidelines for Nutrition in Pregnancy and Infant Feeding Related to the Prevention of Atopic Disease among Infants

Summary of Evidence and Practice Guidelines for Registered Dietitians and Public Health Nurses of the Leeds, Grenville, and Lanark District Health Unit

The following practice guidelines focus specifically on the guidelines for food inclusion/exclusion during pregnancy and lactation, as well as the timing of the introduction of complementary foods for infants at low and high risk of allergic disease with the goal of the prevention of food allergies in infants.

When an infant's "allergic risk" is referred to, there are two levels of risk to consider (1):

Low Risk means:

- Neither parent and no brothers or sisters have asthma or eczema or allergies (food, dust, pollen, cats, etc.....)

High Risk means:

- One or both parents or siblings (considered 1st degree relatives) have asthma or eczema or allergies (food, dust, pollen, cats, etc.....)

Guidelines for Nutrition in Pregnancy and Lactation

- No food restrictions recommended for women during pregnancy or lactation, other than a mother's own food allergies, regardless of allergenic risk of the fetus/infant (1, 2, 3).
- Studies generally have not supported a protective effect of a maternal exclusion diet (including the exclusion of cow's milk and eggs) during pregnancy on the development of atopic disease in infants (2, 3)
- Even if the infant's biological father is allergic to specific foods, there is no need for the mother to avoid those foods to which the father is allergic.

Guidelines for the Introduction of Complementary Foods for Infants at LOW or HIGH Risk of Food Allergies (1, 2)

- Exclusive breastfeeding for 6 months
- After 6 months of age, no solid food restrictions.
 - There is little risk to introducing foods after the age of 6 months, including those foods that are commonly allergenic.
 - Therefore, the following foods are safe to introduce after the age of 6 months – grains, vegetables, fruit, meat (beef, poultry, fish), meat alternatives, egg yolk, egg white, cow's milk products, soy, goat's milk, sesame, peanut, nuts, shellfish/seafood.

Although foods such as peanuts and other nuts are considered safe after six months of age for allergy reasons, **caution needs to be used to prevent choking**. Hard, small and round, smooth and sticky solid foods can block a young child's airway. From a choking perspective, **the following foods are not safe for infants and children under 4 years of age**: popcorn, hard candies, gum, cough drops, raisins, peanuts or other nuts, sunflower seeds, fish with bones, and snacks using toothpicks or skewers (6).

Regardless of allergy risk, **honey should still be delayed until after 1 year** of age to avoid risk of infant botulism (4).

Guidelines for the Feeding of Infant Formula for Infants at HIGH Risk of Food Allergies (1, 2)

- In infants who are not exclusively breastfed for 6 months:
 - There is good evidence that **extensively** hydrolyzed formula, compared with formulas made with intact cow's milk proteins, may delay some allergic symptoms.
 - There is moderate evidence that **partially** hydrolyzed formulas, compared with formulas made with intact cow's milk protein, may delay some allergic symptoms.
 - There is no convincing evidence for the use of soy-based formula for the purpose of allergy prevention.

Extensively hydrolyzed formulas include brand names such as Ross Alimentum, Mead Johnson Pregestimil and Mead Johnson Nutramigen.

Partially Hydrolyzed formulas include brand names such as Nestle Good Start (regular and with added omega-3 fatty acids).

Guidelines for Introducing Solid Foods to the Infant with Diagnosed Food Allergies

If any infant begins to show signs of allergy, a physician or nurse practitioner needs to be consulted. When signs of allergy appear, there may be recommendations for the delay of certain foods in addition to what is stated above (1).

Background

Guidelines for nutrition in pregnancy and breastfeeding, as well as the introduction of solids, needs specific attention when it comes to affecting the risk of allergic disease among infants. Previous guidelines outlined separate recommendations for the introduction of complementary foods to infants based on their status as low or high allergy risk (5, 6). More recent research has pointed recommendations in a different direction.

The American Academy of Pediatrics (AAP) released a clinical report in January 2008 (2), which reviews the nutritional options during pregnancy, lactation, and the first year of life that may affect the development of atopic disease in early life. Atopic diseases include Atopic eczema (dermatitis), food allergy, asthma, and allergic rhinitis. Some of the conclusions of that report include:

- The documented benefits of nutritional intervention that may prevent or delay the onset of atopic disease are largely limited to infants at high risk of developing allergy.
- Current evidence does not support a major role for maternal dietary restrictions during pregnancy or lactation.
- Few studies have examined the timing of the introduction of complementary foods as an independent risk factor for atopic disease in breastfed or formula-fed infants.
- There is evidence that breastfeeding for at least 4 months, compared with feeding formula made with intact cow's milk protein, can prevent or delay the occurrence of some allergic symptoms.
- There is no current convincing evidence that delaying the introduction of solid foods beyond 4 to 6 months of age has a significant protective effect on the development of atopic disease regardless of whether an infant is fed cow's milk protein formula or human milk. This includes the introduction of foods that are considered to be highly allergic such as fish, eggs, and foods containing peanut protein
- For infants after 4 to 6 months of age, there is insufficient data to support a protective effect of any dietary intervention on the development of atopic disease.

Following the release of the report from the AAP, the European Society of Pediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN) Committee on Nutrition (7) released a medical position paper in January 2008, which summarizes the evidence for health effects of complementary foods. In general, the paper states that the evidence for delaying or avoiding the introduction of allergenic foods to prevent or delay the development of allergy is not persuasive. Some of the conclusions of this report include:

- Exclusive or full breastfeeding for 6 months is a desirable goal
- The term "complementary feeding" should embrace all solid foods and liquids other than breastmilk or infant formula
- Avoidance or delayed introduction of potentially allergenic foods, such as fish and eggs, has not been convincingly shown to reduce allergies, either in infants considered at risk for the development of allergy or those not considered to be at risk

Two other papers that support the above recommendations of the AAP and ESPGHAN include documents from EuroPrevall (8) and the European Academy of Allergology and Clinical Immunology (EAACI) (9).

In Canada, there is currently no consensus statement to guide the practice of health professionals when it comes to the prevention of allergic disease in infants. Health Canada (10) has identified nine priority food allergens which include peanuts, tree nuts, sesame seeds, milk, eggs, seafood, soy, wheat, and sulfites (a food additive). In addition, a number of individual research sources and professional bodies in Canada (such as Dietitians of Canada) have begun to provide some direction to health care practitioners in Canada that, while not a consensus, can outline nutrition recommendations based on current evidence. Those sources are cited throughout the document.

It is important to remember that the lack of conclusive evidence does not indicate that a particular clinical approach is either approved or disproved. Rather, it indicates that further research is needed to clarify whether there is a positive or negative effect on atopy outcome (2). **Considering these limitations, the information and recommendations are subject to change at any time as new research is completed, and practice guidelines are updated.**

Current infant feeding guidelines endorsed by Health Canada and the Canadian Pediatric Society recommend exclusive breastfeeding for the first 6 months of life (11). Therefore, while it is understood that the protective effect of breastfeeding in terms of allergic disease is most well documented as it relates to the first 4 months of life, infant feeding recommendations for infants at low or high risk of allergy will focus on exclusive breastfeeding for the first 6 months so to encourage this practice among families. In addition, the focus of this document is on the prevention of atopic disease rather than the treatment of atopic disease or food allergy in infancy.

Understanding Allergenic “Risk”

When an infant’s “allergic risk” is referred to, there are two levels of risk to consider (1):

Low Risk means:

- Neither parent and no brothers or sisters have asthma or eczema or allergies (food, dust, pollen, cats, etc.....)

High Risk means:

- One or both parents or siblings (considered 1st degree relatives) have asthma or eczema or allergies (food, dust, pollen, cats, etc.....)

When the “**risk of allergy**” is discussed, it refers to the risk of allergy in general, not just food. Therefore, family history of non-food allergy can increase the risk of an infant having a food specific allergy. The development of food allergies is not specific to the existence of food allergy in the family.

“**Family history**” of allergy, as outlined above, refers to the biological parents and siblings of the infant being considered. Extended family, such as aunts, uncles, cousins, and grandparents has much less of an effect on an infant’s allergy risk. Therefore, allergies in extended family are not considered in evaluating an infant’s individual risk of allergic disease.

Allergies that impact risk of food allergy include asthma, eczema, and other allergies such as food, dust, pollen, and pets (1). Allergy to drugs (such as penicillin or sulfa drugs) and venom allergies are not considered part of an infant’s food allergy risk at this time. If a child is fostered or adopted, it is the biological family that poses the risk and all efforts should be made to find out what the allergy history of the biological family is. A parent or sibling’s food allergy (or any allergy) should be confirmed by diagnosis by a physician to be considered as contributing to an infant’s risk of allergic disease.

Symptoms that May Indicate Food Allergy in the Baby and Young Child Adapted from (1)

The following symptoms are signs that an allergic reaction to a food may be happening. If a parent suspects that their infant is having an allergic reaction to food and is exhibiting any of these symptoms, they should consult their physician or nurse practitioner.

<p>Gastrointestinal tract</p> <ul style="list-style-type: none"> • Abdominal distress • Frequent “spitting up” • Nausea • Vomiting • Diarrhea <p>Gastrointestinal symptoms associated with food allergy occur soon after consuming a food; does not include chronic stomach, intestinal, or bowel conditions.</p> <p>Skin</p> <ul style="list-style-type: none"> • Hives (urticaria) • Facial reddening and swelling (angioedema) • Swelling and reddening around the mouth • Eczema • Redness on skin (appears soon after eating food) • Reddened ears • Rash of unknown origin (appears soon after eating food) <p>Skin related symptoms associated with food allergy occur acutely within minutes after consuming a food; does not include chronic skin conditions.</p>	<p>Respiratory tract</p> <ul style="list-style-type: none"> • Nasal stuffiness • Sneezing • Nose rubbing • Noisy breathing • Persistent cough • Wheezing • Asthma • Itchy, runny, reddened eyes <p>Respiratory symptoms associated with food allergy occur acutely within minutes after consuming a food, and often respiratory are not the only symptoms of the food allergy that appear; does not include chronic respiratory symptoms.</p> <p>Other</p> <ul style="list-style-type: none"> • “Feeding problems” (baby may forcibly reject food) • Failure to gain weight (failure to thrive) • Weight loss • In extreme cases, involvement of all body systems in anaphylaxis. This can be life threatening.
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Case Scenarios

Q: If a pregnant woman has asthma and lactose intolerance, should she avoid certain foods?

A: No. There are no food restrictions recommended in pregnancy to prevent food allergies in infants. Asthma is an allergic disease and therefore her infant is at higher risk of food allergies – the introduction of solid foods will need to be delayed according to guidelines for high allergy risk infants. However, lactose intolerance is not a food allergy – this alone does not put the infant at higher risk.

Q: If the baby's dad has eczema, does that make the infant high risk for developing food allergy?

A: Yes. Atopic eczema is an allergic disease, and if the baby's father has eczema then the baby is at higher risk of developing allergies, including to foods. However, there is no evidence-based proof that delaying the introduction of solid foods to an infant at high risk of allergy will protect them from developing food allergy.

If the eczema is non-atopic, then this does not apply. Examples of non-atopic eczema include:

- hand eczema due to use of harsh soap, cleaning agents, or hand sanitizer
- eczema due to contact reactions to fragrances or metal (e.g., nickel)

A person can have both Atopic and non-atopic eczema. A physician should be consulted regarding whether an individual's particular kind of eczema is Atopic or not.

Q: If a mother is breastfeeding and the baby's father has a peanut allergy, does the breastfeeding mother need to avoid peanuts?

A: No. Although peanut protein will pass through breastmilk, there is no evidence to suggest that a breastfeeding mother needs to avoid certain foods in order to prevent food allergy in a high risk infant. And although the baby's father having a peanut allergy makes the baby "high risk" for developing atopic disease, there is no evidence-based proof that delaying the introduction of solid foods to an infant at high risk of allergy will protect them from developing food allergy.

References

1. Joneja J. Dealing with Food Allergies in Babies and Children. Boulder: Bull Publishing Company. 2007.
2. Greer FR, Sicherer SH, Burks AW. Effects of early nutritional interventions on the development of atopic disease in infants and children: The role of maternal dietary restriction, breastfeeding, timing of introduction of complementary foods, and hydrolyzed formulas. *Pediatrics* 2008; 121:183-91.
3. Kramer MS, Kakuma R. Maternal dietary antigen avoidance during pregnancy and/or lactation for preventing or treating atopic disease in the child. *Cochrane Database Systematic Review* 2008; 3:CD000133.
4. Canadian Pediatric Society, Dietitians of Canada, Health Canada. Nutrition for Healthy Term Infants. Minister of Public Works and Government Services Canada 1998.
5. Halken S. Prevention of allergic disease in childhood: clinical and epidemiological aspects of primary and secondary allergy prevention. *Pediatr Allergy Immunol* 2004; 15 (Suppl.16):9-32.
6. Muraro A, Dreborg S, Halken S, et al. Dietary prevention of allergic diseases in infants and small children. Part III: Critical review of published peer-reviewed observational and interventional studies and final recommendations. *Pediatr Allergy Immunol* 2004; 15:291-307.
7. Agostoni C, Decsi T, Fewtrell M, Goulet O, Kolacek S, Koletzko B, Fleisher Michaelson K, Moreno L, Puntis J, Rigo J, Shamir R, Szajewska H, Turck D, van Goudoever J. Complementary Feeding: A commentary by the ESPGHAN Committee on Nutrition. *Journal of Gastroenterology and Nutrition* 2008; 46:99-110.
8. Grimshaw KE, Allen K, Edwards CA, Beyer K, Boulay A, van der Aa LB, Sprikkelman A, Belohlavkoba S, Clausen M, Dubakiene R, Duggan E, Reche M, Marino LV, Norhede P, Ogorodoba L, Shoemaker A, Stanczyk-Przyluska A, Szepefalusi Z, Vassilopoulou E, Veehof SH, Vlieg-Boerstra BJ, Wjst M, Dubois AE. Infant feeding and allergy prevention: A review of current knowledge and recommendations. A Europrevall state of the art paper. *Allergy* 2009; 64(10):1407-16.
9. Host A, Halken S, Muraro A, Dreborg S, Niggemann V, Aalberse R, Arshad SH, von Berg A, Carlsen KH, Dusche'n K, Eigenmann PA, Hill D, Jones C, Mellon M, Oldeus G, Oranje A, Pascual C, Prescott S, Sampson H, Svartengren M, Wahn U, Warner JA, Warner JO, Vandenplas Y, Wickman M, Zeiger RS. Dietary Prevention of Allergic diseases in infants and small children. *Pediatr Allergy Immunol* 2008; 19:1-4.
10. Health Canada. Food Allergies. 2007 [cited February 4, 2008]. Available from http://www.hc-sc.gc.ca/fn-an/securit/allerg/fa-aa/index_e.html.
11. Health Canada. Statements: Exclusive Breastfeeding Duration and Vitamin D Supplementation, 2004