Nutrition Guideline
Healthy Infants and Young Children
Introduction of Complementary Foods: Commonly Allergenic Foods

For Professional Reference Only

Applicable to: Nurses, Physicians, Dietitians, and Other Health Professionals

Recommendations

The recommendations for the introduction of commonly allergenic foods in this nutrition guideline apply to all infants, both term and preterm, and both those at low and high risk for food allergy.

- Intentionally introduce commonly allergenic foods (peanut, egg, cow's milk, tree nuts, fish, shellfish, wheat, soy, and sesame) to an infant when starting complementary foods, at around 6 months of age for term infants and 4-6 months corrected age for preterm infants.
- Prioritize peanut and egg as the first commonly allergenic foods to introduce when starting complementary foods as the evidence for reduced allergy risk is strongest for these two allergens.
- Once a commonly allergenic food has been introduced and tolerated, continued and regular ingestion is recommended to maintain tolerance. Expert opinion suggests offering peanut and egg in amounts an infant accepts and enjoys, aiming for weekly exposure, and regularly incorporating the other commonly allergenic foods into an infant's diet following family preferences and cultural practices.
- It is not recommended to rub a food on an infant's skin before feeding it to them as this may trigger an allergic immune response once the food is ingested. Skin contact with a food may also cause an irritant effect that could be misinterpreted as an allergic reaction.
- To make it easier to identify the offending food if an allergic reaction occurs, introduce only one commonly allergenic food per day.

Introduction

The purpose of the Introduction to Complementary Foods Nutrition Guideline: Commonly Allergenic Foods is to provide health professionals with an overview of the evidence-based nutrition recommendations on introducing commonly allergenic foods to infants to help prevent IgE-mediated food allergies, help address parent* concerns regarding the introduction of these foods and provide answers to commonly asked questions (*See* ***Key Questions List***).

* The term 'parent' will be used throughout this Nutrition Guideline to indicate parents, caregivers, or other persons caring for a child in the context of the family unit.

While comprehensive, this Nutrition Guideline will not include detailed information specific to:

- **Diagnoses and/or treatment of food allergy**: information and guidance on diagnoses and/or treatment of food allergy, including medications, warrants a consultation with Health Link (dial 811), a family physician, pediatrician or allergist.
- **Prevention of non-IgE mediated food allergies:** more information can be found here: Non-IgE-mediated food allergy: Evaluation and management | Canadian Paediatric Society (cps.ca)

This information is intended as a general resource only and is not meant to replace the medical counsel of a physician or individual consultation with a Registered Dietitian (RD). It is the responsibility of the health professional to evaluate the situation of each patient in their care, and apply the Nutrition Guideline appropriately. Individuals who are at high risk of malnutrition or who have a medical condition that is impacted by nutrition should receive RD intervention. See *Nutrition Guideline: Referral to a Registered Dietitian* for more information.

Background

The Nutrition Guideline was developed by Nutrition Services 0-6 Target Population Provincial Working Group, in consultation with the Canadian Paediatric Society and the Alberta Health Services (AHS) Maternal Newborn Child & Youth Strategic Clinical Network. The Nutrition Guideline is based on scientific evidence, best practice and expert opinion.

Food allergy affects an estimated 2 to 10% of the population.[1] It is unclear whether food allergy prevalence has increased over time[1–3] but perceived food allergies seem to have increased.[2,3]

Definitions

- **Anaphylaxis**: a serious allergic reaction that is rapid in onset and may cause death.[4] Reactions typically occur minutes to a few hours after exposure to the allergen.[5] Widely used criteria for suspected anaphylaxis can be found in **Appendix 1**.
- **Food allergens**: the components within foods that trigger adverse immunologic reactions; these are most often specific glycoproteins that can interact with the body's immune cells in a way that initiates the development of a food allergy.[3]
- **Food allergy**: an adverse health effect arising from a specific immune response that occurs reproducibly on exposure to a given food, and that can be either IgE-mediated or non-IgE-mediated.[3]
- **High-risk for allergic disease:** having either a personal history of atopy (tendency to produce IgE antibodies in response to allergens), including eczema, or having a first-degree relative with atopy such as eczema, food allergy, allergic rhinitis, or asthma.[6]
  Note: Some studies cited in this guideline used different criteria for defining infants at high risk for developing allergic disease, such as the presence of severe eczema and/or egg allergy.[7]
- **Oral tolerance**: the state of local and systemic immune unresponsiveness that is induced by oral administration of innocuous antigens such as food proteins.[8]
- **Sensitization**: a condition in which an individual produces detectable IgE antibodies to a particular allergen(s). It precedes and is required for the cell manifestations of a food allergy, but not all individuals with detectable IgE will experience a food allergy reaction to the allergen recognized by that IgE.[3]

Key Questions List

Key nutrition questions related to the introduction of commonly allergenic foods that are addressed in this Nutrition Guideline are listed below.

Recommendations and Rationale

- When is it recommended that commonly allergenic foods be introduced to infants?
- Which commonly allergenic foods should be introduced to infants, and why?
- Do the recommendations around the introduction of commonly allergenic foods apply to all infants?
- How often and how much of a commonly allergenic food does an infant need to eat to maintain tolerance?

Allergy Symptoms

- What symptoms should parents watch for that might indicate an allergic reaction to a food?
- What is the risk of an anaphylactic reaction the first time an infant eats a commonly allergenic food?

Practical Considerations

- Is it recommended to rub a food on an infant's skin before feeding it to them?
- What practical guidance can be offered to parents who are introducing commonly allergenic foods to an infant for the first time?
- How can families who have a member of the household with a diagnosed food allergy offer the specific food allergen to an infant?

Resources

- Are there any resources related to introducing commonly allergenic foods that I can use with my patients?
- Are there any resources related to feeding healthy infants and children that I can use with my patients?

Answers to Key Questions

Recommendations and Rationale

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When is it recommended that commonly allergenic foods be introduced to infants?

AHS Nutrition Services recommends that commonly allergenic foods be intentionally introduced to an infant when starting complementary foods (at around 6 months of age for term infants and 4-6 months corrected age for preterm infants). If tolerated, subsequent regular inclusion in an infant's diet is advised.[9]

Which commonly allergenic foods should be introduced to infants, and why?

Nutrition Services recommends that parents introduce commonly allergenic foods to infants (peanut, egg, cow's milk, tree nuts, fish, shellfish, wheat, soy,[6] and sesame[9,10]) when starting complementary foods at around 6 months of age for term infants and 4-6 months corrected age for preterm infants.

Emerging evidence suggests that the early introduction† of peanut and egg is associated with a lower risk of developing a peanut and egg allergy, respectively.[11,12] Prioritize these two allergens as the first commonly allergenic foods to introduce when starting complementary foods.[9] Some experts hypothesize the mechanisms of sensitization and protection of introducing peanut and egg are likely the same for other allergenic foods,[13] and some organizations recommend introducing all commonly allergenic foods when other complementary foods are introduced to an infant's diet.[14,15]

Do the recommendations around the introduction of commonly allergenic foods apply to all infants?

Yes, the Nutrition Services recommendations for the introduction of commonly allergenic foods apply to all infants, both term and preterm,[16] and both those at low- and high risk for food allergy.[17]

The evidence that early introduction of commonly allergenic foods may have a role in preventing food allergy has been primarily focused on infants at high risk for allergic disease.[18] Some researchers suggest that all infants, regardless of allergy risk, could potentially benefit from early introduction of allergenic foods,[17,19] and some organizations have released guidelines that recommend commonly allergenic foods be introduced to all infants when starting complementary foods.[14,15] Applying the recommendations in this guideline to all infants allows for a universal public health message and does not depend on the reliability of screening to determine if an infant is at low or high risk for allergic disease.

In some settings, clinicians may provide advice for infants identified as high risk for allergic disease to introduce commonly allergenic foods earlier than around 6 months of age. As long as the infant is at least 4 months of age (4 months corrected age for preterm infants) and showing signs of readiness for complementary foods, families are encouraged to follow this individual guidance.

† Early introduction in these studies was 4-6 months for egg and 4-11 months for peanut

Some evidence suggests that food allergy risk is not increased with the early introduction of complementary foods for preterm infants.[20] However, there is insufficient evidence on the optimal timing specifically for the introduction of commonly allergenic foods to preterm infants. At this time, Nutrition Services' opinion is to apply the recommendations for term infants to preterm infants and introduce commonly allergenic foods between 4-6 months corrected age, when starting complementary foods.[16]

How often and how much of a commonly allergenic food does an infant need to eat to maintain tolerance?

Once a commonly allergenic food has been introduced and is tolerated, continued and regular ingestion is recommended to maintain tolerance.[9] There is insufficient evidence to recommend a precise dose and frequency of ingestion of commonly allergenic foods to support tolerance.[9] Regular exposure for several years is likely more important than a specific amount or frequency.[9] Expert opinion suggests offering peanut and egg in amounts an infant accepts and enjoys, aiming for weekly exposure, and regularly incorporating the other commonly allergenic foods into an infant's diet following family preferences and cultural practices.[9] If the allergen exposure is not continued as part of an infant's usual diet, this may increase the risk of developing a food allergy.[15,21]

Allergy Symptoms

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What symptoms should parents watch for that might indicate an allergic reaction to a food?

Food allergy symptoms usually develop within minutes of eating a food, but sometimes can occur up to several hours after ingestion.[5,22] Allergy symptoms occur on a continuum, from mild (requiring no or minimal intervention) to anaphylactic shock (requiring life-saving therapies).[23] Food allergy symptoms are listed below:[5,22–26]

- **Skin and mucosal tissue:** hives, itching, redness/flushing, swollen face, lips, tongue, uvula
- **Respiratory (breathing):** coughing, wheezing, shortness of breath, chest pain/tightness, throat tightness, trouble swallowing, hoarse voice/cry
- **Nasal symptoms:** nasal congestion, runny, itchy nose, watery eyes, sneezing
  Note: unlikely symptoms of food allergy if experienced >2 hours after food ingestion or without other allergic symptoms such as hives, swelling, or vomiting
- **Gastrointestinal (stomach):** nausea, pain/cramps, vomiting, diarrhea
- **Cardiovascular (heart):** tachycardia (not related to crying), change in skin colour (pale, blue), weak pulse, tachypnea (rapid breathing), dizziness, loss of consciousness

Because infants are unable to verbalize symptoms, they can also demonstrate some of the above symptoms with:[5]

- irritability/inconsolability
- sudden tiredness/lethargy/seeming limp
- excessive drooling

Skin and gastrointestinal symptoms are generally considered mild symptoms.[23] If an infant shows mild symptoms of a food allergy when a new food is introduced, parents are advised to stop feeding the food and use allergycheck.ca to determine the likelihood that the symptoms were caused by a food allergy. A family physician can help them determine if they need a referral to an allergist or if they can simply trial the food again.

The most severe symptoms are lower respiratory tract and laryngeal symptoms, neurologic, cardiovascular, or reactions involving multiple organ systems.[27] Anaphylaxis is a serious allergic reaction that is rapid in onset and may be life-threatening.[4] Anaphylaxis also lies along the continuum of severity, ranging from mild-moderate respiratory symptoms to circulatory shock and/or collapse.[28] Anaphylaxis usually involves two or more organ systems;[22] although rarely, acute hypotension can occur after exposure to a known or highly probable allergen, even in the absence of typical skin involvement.[4,24] In infants, hypotension can present as tachycardia not related to crying, poor perfusion (cool or pale distal extremities, cyanosis), tachypnea (shallow breathing), inconsolability, sudden tiredness/lethargy/hypotonia, or loss of consciousness.[26] See ***Appendix 1*** for criteria to help identify anaphylaxis.

If anaphylaxis is suspected, seek immediate medical attention by calling 911, stating that they suspect the infant is having an anaphylactic reaction.[29]

Parents can consult with a physician or pharmacist for advice on allergy treatment medications.

What is the risk of an anaphylactic reaction the first time an infant eats a commonly allergenic food?

The available evidence, although limited, suggests that the risk of an anaphylactic reaction the first time an infant eats a commonly allergenic food is low, and that the risk of a severe anaphylactic reaction is extremely unlikely, with infants demonstrating less severe reactions than older children.[30,31]

In the Learning Early About Peanut (LEAP) study‡, no infants had anaphylactic reactions on the first ingestion of peanuts.[7] In other studies, the risk of an anaphylactic reaction on first ingestion of peanut was low.[32–34] Of infants who did experience anaphylactic reactions on first ingestion of a food, most had mild or moderate reactions,[32–35] with many of these studies reporting no severe anaphylactic reactions.[32,34,35]

If anaphylaxis is suspected, seek immediate medical attention by calling 911.[15]

Practical Considerations

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Is it recommended to rub a food on an infant's skin before feeding it to them?

No, it is not recommended to rub a food on an infant's skin before feeding it to them. If an infant is exposed to a food allergen through the skin, especially if there is eczema or broken skin, food sensitization can occur, and an allergic immune response can be triggered once the food is ingested.[3,36] Skin contact with a food is not a way to determine if the food will be tolerated when it is eaten and may also cause an irritant effect that could be misinterpreted as an allergic reaction.[15]

It is suggested that early oral exposure to food allergens through the digestive tract can promote immune tolerance, potentially preventing the development of a food allergy.[37] Therefore, experts recommend that infants be exposed to food allergens early through their gastrointestinal tract to achieve oral tolerance to the allergen.[38]

‡ The LEAP trial randomized 640 infants aged 4 to 11 months with severe eczema and/or egg allergy and peanut skin prick test wheals 1-4 mm to either consume or avoid peanut until age 5 years.[7]

What practical guidance can be offered to parents who are introducing commonly allergenic foods to an infant for the first time?

Parents can be provided with the following advice when introducing commonly allergenic foods to an infant for the first time:

- A commonly allergenic food should not be the first food offered to an infant.[9] Introduce an iron-rich food that is not one of the common allergens first (e.g., lentils, beef, or oat baby cereal with iron in an appropriate texture for the infant's developmental stage). This will help ensure that symptoms such as spitting/gagging that might occur when an infant is first learning to eat complementary foods are not mistaken as a sign of an allergy.
- Introduce only one commonly allergenic food per day.[39] Although there is no evidence showing that this is necessary,[9] this may make it easier to identify a food that may have caused an allergic reaction if one were to occur.
- Introduce commonly allergenic foods when at least one adult is present to give their full attention to the infant, and when the infant will be awake for at least 2 hours afterwards, in case allergy symptoms develop.[15]
- The texture or size of any complementary food should be age-appropriate to prevent choking.[6] For example, for young infants, smooth peanut butter can be diluted with water or mixed with a previously tolerated food (e.g., breastmilk, infant cereal, yogurt).
- On the first introduction, offer the infant a small amount of the commonly allergenic food on the tip of a spoon. Wait 10 minutes. If no symptoms develop, continue to give the remainder of the food at the infant's usual pace of eating.[15] When introducing a commonly allergenic food for the first time, there is no need to go to an emergency room parking lot as a severe allergic reaction in infants rarely occurs.[15]
- Introduce commonly allergenic foods when an infant is feeling well. Symptoms of other illnesses, like a cold, may be mistaken for possible allergic reactions.

How can families who have a member of the household with a diagnosed food allergy offer the specific food allergen to an infant?

In families where a member of the household has a diagnosed food allergy, parents are encouraged to consider the overall benefit of adding the allergen to the infant's diet (reduced risk of allergy in the infant) versus the risk (potential for further sensitization and accidental exposure of the family member with the allergy).[40] Many families are successful in offering foods to which a family member is allergic safely in the home with careful cleaning of surfaces, having designated eating areas (highchairs, tables), and teaching household members not to share foods.[15] Proper handwashing with soap and warm water for all family members before and after eating can reduce the risk of spreading food allergens within the home.[15] It is also possible to offer those allergenic foods to infants outside of the home, such as at a relative's home or in an outdoor setting such as a park.[15]

Resources

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Are there any resources related to introducing commonly allergenic foods that I can use with my patients?

Allergy Check (allergycheck.ca) is an online tool that can be used by parents and professionals to help understand whether or not specific symptoms may be caused by a food allergy and when it might be helpful to see a physician about food allergy. It also guides users to credible sources of information. Allergy Check is a collaborative project by the BC Children's Hospital's Division of Allergy and Immunology and the Digital Lab, an integrated unit of the Hospital and University of British Columbia's Department of Pediatrics, and supported by Food Allergy Canada and the Canadian Society of Allergy and Clinical Immunology.[41]

Note: Allergy Check is referred to as an 'app' (application); however, it functions as a website and does not require the user to download anything to their device.

Eat Early. Eat Often. (Food Allergy Canada - available on the Food Allergy Canada Early Introduction website) is a client resource with practical tips on introducing commonly allergenic foods to infants. While this resource was developed specifically for use with infants at high risk of food allergy, Alberta Health Services recommends that all infants, regardless of food allergy risk, be offered commonly allergenic foods and can use the guidance in the resource Eat Early. Eat Often.

Are there any resources related to feeding healthy infants and children that I can use with my patients?

For nutrition resources visit Nutrition Education Materials at ahs.ca/nutritionhandouts and click on **Infants** or **Children/Adolescents.**

For more health information related to healthy infants and children see Healthy Parents Healthy Children.

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Appendix 1

Anaphylaxis Criteria

Anaphylaxis is highly likely when any *one* of the following 3 criteria is fulfilled:

1.	Acute onset of an illness (minutes to several hours) with involvement of the skin, mucosal tissue, or both (e.g., generalized hives, pruritus or flushing, swollen lips-tongue-uvula)
	AND AT LEAST ONE OF THE FOLLOWING:
	a) Respiratory compromise (e.g., dyspnea, wheeze-bronchospasm, stridor, reduced peak expiratory flow, hypoxemia)
	b) Reduced blood pressure or associated symptoms of end-organ dysfunction (e.g., hypotonia [collapse], syncope, incontinence)
OR	
2.	Two or more of the following that occur rapidly after exposure to a *likely* allergen for that patient (minutes to several hours): a) Involvement of the skin-mucosal tissue (e.g., generalized hives, itch-flush, swollen lips-tongue-uvula) b) Respiratory compromise (e.g., dyspnea, wheeze-bronchospasm, stridor, reduced peak expiratory flow, hypoxemia) c) Reduced blood pressure or associated symptoms (e.g., hypotonia [collapse], syncope, incontinence) d) Persistent gastrointestinal symptoms (e.g., crampy abdominal pain, vomiting)
OR	
3.	Reduced blood pressure after exposure to *known* allergen for that patient (minutes to several hours): a) Infants and children: low systolic blood pressure (age-specific) or greater than 30% decrease in systolic blood pressure* b) Adults: systolic blood pressure of less than 90 mm Hg or greater than 30% decrease from that person's baseline
*Low systolic blood pressure for children is defined as less than 70 mm Hg from 1 month to 1 year, less than (70 mm Hg 1 [2 x age]) from 1 to 10 years, and less than 90 mm Hg from 11 to 17 years.	

Source: Sampson HA, Muñoz-Furlong A, Campbell RL, Adkinson NF, Bock SA, Branum A, et al. Second symposium on the definition and management of anaphylaxis: Summary report - Second National Institute of Allergy and Infectious Disease/Food Allergy and Anaphylaxis Network symposium. J Allergy Clin Immunol. 2006;117(2):391–7.