

353 Food Allergies

Definition/Cut-off Value

Food allergies are adverse health effects arising from a specific immune response that occurs reproducibly on exposure to a given food (1).

This risk is assigned upon the presence of a food allergy diagnosed, documented, or reported by a physician or someone working under a physician's orders, or as self-reported by applicant/participant/caregiver. See Clarification for more information about self-reporting a diagnosis.

Note: Risk criteria 353 only applies to food allergies and should not be assigned to those who have non-immunologic adverse reactions to food. See Clarification section for more information.

Participant Category and Priority Level

Category	Priority
Pregnant Women	I
Breastfeeding Women	I
Non-Breastfeeding Women	III, IV, V, or VI
Infants	I
Children	III

Justification

Food allergies are a significant health concern as they can cause serious illness and life-threatening reactions. Prompt identification and proper treatment of food allergies improves quality of life and nutritional well-being. The actual prevalence of food allergies is difficult to establish due to variability in definitions and study designs. Studies of large, nationally representative samples suggest that 5.8% of children (ages 0-17) and 6.2% of adults have a food allergy based on a clinician's diagnosis and/or the severity of reported symptoms (2,3). These estimates do not include food intolerances or other non-immunologic reactions to food. Perceived food allergy prevalence in these studies was 19% among adults and 11.4% among children, suggesting that more access to testing and counseling is needed (2,3).

Common Food Allergens

Although reactions can occur from the ingestion of any food, a small number of foods are responsible for most food-induced allergic reactions (4). The foods that most often cause allergic reactions are listed below with their prevalence among all U.S. children and adults:

	Children (2)	Adults (3)
Any food allergy	7.6 %	10.8 %
Peanuts	2.2 %	1.8 %
Cow's milk	1.9 %	1.9 %
Shellfish	1.3 %	2.9 %
Tree nuts	1.2 %	1.2 %

Eggs	0.9 %	0.8 %
Fish	0.6 %	0.9 %
Wheat	0.5 %	0.8 %
Soy	0.5 %	0.6 %
Sesame*	0.2 %	0.2 %

*As of January 1, 2023, sesame was officially recognized as the 9th major food allergen in the United States and is required to be identified on food labels.

For many individuals, food allergies appear within the first two years of life. The majority of allergies to cow's milk, eggs, wheat and soy resolve in early childhood. In contrast, allergies to peanuts and tree nuts typically persist to adulthood. Adults may have food allergies continuing from childhood or may develop food allergies after childhood, which usually continue through life (5,6).

When a person has an allergy to one food, they tend to be allergic to similar foods within a food group. For example, all shellfish are closely related; if a person is allergic to one shellfish, there is a strong chance that person is also allergic to other shellfish. The same holds true for tree nuts, such as almonds, cashews, and walnuts (1).

Food Allergies vs. Non-Immunologic Adverse Reactions to Food

Food allergy reactions occur when the body's immune system responds to a food as if it were a threat. However, not all adverse reactions to food are caused by food allergies. Some are caused by "non-immunologic adverse reactions to food," which includes a wide range of disorders related to the consumption of foods (these reactions are often referred to as food intolerances, however this term is often misused, so it is not preferred) (7). Non-immunologic adverse reactions to food are often misdiagnosed as food allergies because the symptoms can be similar. However, unlike food allergies that trigger an immune response that may result from exposure to even small traces of a food allergen, non-immunologic adverse reactions to food do not involve the immune system and are typically dose-dependent (7). The National Institute of Allergy and Infectious Disease (NIAID) separates non-immunologic adverse reactions to food into four categories, including Metabolic, Pharmacologic, Toxic, and Idiopathic / Undefined (1,7), as follows:

1. **Metabolic** - A reaction is caused by an inability to metabolize a food component. For example, the most common non-immunologic adverse reaction to food is lactose intolerance and is caused by a deficiency in the enzyme lactase, which is necessary in the metabolism of lactose, a type of sugar found in dairy products. (For more information see nutrition risk criterion #355, Lactose Intolerance.)
2. **Pharmacologic** - A reaction caused by the consumption of a food or food additive that results in drug-like pharmacologic effects. For example, overconsumption of caffeine can cause undesirable symptoms for some individuals such as nervousness, insomnia, headaches, nausea, and diarrhea (8).
3. **Toxic** - A reaction caused by a toxin found in a food. For example, consumption of fish in the Scombridae family (e.g., tuna, mackerel, bonito, etc.) can cause scombroid fish poisoning or histamine fish poisoning if the fish contains high levels of histamine (9).
4. **Idiopathic / Undefined** - There are some reactions for which there has yet to be a defined mechanism for the resulting symptoms. For example, many individuals claim to have a hypersensitivity to monosodium glutamate (MSG), and report a myriad of symptoms including headaches, numbness, dizziness, heart palpitations, chest pain and back pain (10). However, decades of research have yet to prove a definitive link between these symptoms and the consumption of MSG (11). Some research

suggests that those diagnosed with Irritable Bowel Syndrome (IBS) may have some of their symptoms associated with undefined non-immunologic adverse reactions to food including wheat (e.g., non-celiac wheat sensitivity (NCWS)) and foods high in fermentable oligo-, di-, and mono-saccharides and polyols (FODMAPs) (12).

See clarification section for more information about assigning risks for these reactions to foods.

IgE vs Non-IgE Mediated Allergic Reactions to Foods

There are several types of immune responses to foods, including immunoglobulin E (IgE)-mediated, non-immunoglobulin E (non-IgE)-mediated or mixed.

The most common types of food allergies involve IgE-mediated responses. In an IgE-mediated response, the immune system produces allergen-specific IgE antibodies (sIgE) when a food allergen first enters the body. Upon re-exposure to the food allergen, the sIgE identifies it and quickly initiates the release of chemicals, such as histamine (13). These chemicals cause various symptoms based on the area of the body in which they were released. These reactions typically occur within minutes up to a couple of hours after ingestion and include symptoms such as urticaria (hives), angioedema (swelling), wheezing, cough, nausea, vomiting, hypotension (low blood pressure) and anaphylaxis (6).

Food-induced anaphylaxis is the most severe form of IgE-mediated food allergies. It often occurs rapidly, within seconds to a few hours after exposure, and is potentially fatal without proper treatment (often including the use of epinephrine). Food-induced anaphylaxis often affects multiple organ systems and produces many symptoms, including difficulty breathing, swelling and reduced blood pressure (14). Tree nuts, peanuts, milk, egg, fish, and shellfish are the leading causes of food-induced anaphylaxis (1). Prompt diagnosis and avoidance of allergens is essential to prevent life-threatening reactions.

Non-IgE-mediated allergic reactions to foods are generally delayed in onset, occurring more than 2 hours after ingestion, are more chronic in nature, and primarily affect the skin and/or gastrointestinal system (6). Celiac Disease (Risk 354) is one example of a non-IgE mediated allergic reaction to food. Other less common examples, which fall under Risk 353: Food Allergies, are found in the table below.

Examples of Non-IgE mediated allergic reactions to foods:

Condition	Brief Description
Food protein-induced enterocolitis syndrome (FPIES)	FPIES is a gastrointestinal food hypersensitivity that manifests as episodes of severe vomiting and diarrhea. It can lead to acute dehydration, changes in blood pressure and body temperature, pallor, and lethargy. If chronic and undiagnosed, it can cause weight loss or failure to thrive (Risk 134). FPIES is commonly misdiagnosed initially as a severe stomach illness because the symptoms are so similar. Though any food can trigger FPIES, the most common triggers are cow's milk, soy, rice, and oats. Management involves strict avoidance of the triggering food. Most cases resolve by age 5 (15,16).
Food protein-induced allergic proctocolitis (FPIAP)	FPIAP is a food allergy that manifests as bloody stools, typically within the first few weeks of life. The most common food that triggers FPIAP is cow's milk. Symptoms typically resolve with elimination of cow's milk and soy protein. Cases often resolve around 12 months of age (17,18).
Food protein-induced enteropathy (FPE)	FPE (sometimes referred to as cow's milk-sensitive enteropathy) involves injury to the small intestine when cow's milk is present in the diet (19). Symptoms typically present as protracted diarrhea within weeks of introducing cow's milk protein and resolve when cow's milk is avoided. Other food proteins, such as soybean, wheat,

and egg, can also cause FPE. More than half of infants with FPE also have vomiting and failure to thrive, and some may have malabsorption, abdominal distension and early satiety. Bloody stools are usually absent (16,20,21).

Prevention

There is no evidence that pregnant or breastfeeding women should restrict any foods to prevent the development of allergies in their offspring (22). There is also no evidence to suggest that exclusive breastfeeding is associated with the prevention of any specific food allergies among breastfed infants (23). However, exclusive breastfeeding for the first 3-4 months has been shown to decrease the risk of eczema¹ in the first 2 years of life, a condition which has been associated with the development of food allergies (24). There are currently no published trials that compare the timing of the introduction of allergenic foods on the development of food allergy in exclusively formula-fed versus exclusively breastfed infants (22).

The American Academy of Pediatrics (AAP) recommends that all infants, including those with a family history of food allergies, be exclusively breastfed until 6 months of age, unless contraindicated for medical reasons, and continue breastfeeding as long as mutually desired by mother and child for two years or more (22,25). For infants who cannot be exclusively breastfed, there is not currently a specific formula that is recommended to prevent food allergy. Past recommendations to feed hydrolyzed formulas or soy formulas to prevent food allergies in high-risk infants who cannot be exclusively breastfed are not supported by current research (26-30).

Previous research suggested a benefit of the delayed introduction of highly allergenic foods to high-risk infants and children. However, this advice on the introduction of potentially allergenic food was modified in 2008 when new research failed to find any benefit regarding the delayed introduction of allergenic foods to at-risk infants and children (22, 31-33). Additional research has even suggested that the early introduction of allergenic foods may help to prevent the development of allergies to the foods offered among both the general population as well as high-risk populations (34-39). It is also important to note that exclusion diets should not be advised in the treatment of children with eczema unless there is a clinical history of IgE-mediated allergic reactions. Unjustified elimination of a specific food can be harmful and lead to loss of tolerance to the food, with high rates of anaphylaxis when reintroduced (40). Currently, the strongest evidence for recommendations regarding the benefits of introducing potentially allergenic foods has been derived from research on peanuts and eggs. As a result, the AAAAI recommends the introduction of peanut-containing products and egg or egg-containing products to all infants, irrespective of their relative risk of developing peanut allergy, starting around 6 months of life. The AAAAI also recommends not deliberately delaying the introduction of other potentially allergenic foods (cow's milk, soy, wheat, tree nuts, sesame, fish, shellfish) once the introduction of solid foods has begun (23).

Introduction to potentially allergenic foods can occur at home when the infant is developmentally ready for complementary food introduction, in accordance with the family's cultural practice, but not before the infant demonstrates developmental readiness with eating a few other common starter foods. While the AAAAI indicates that in-office allergy screening (such as sIgE and skin prick testing) by healthcare professionals is not required prior to offering potentially allergenic foods, irrespective of relative risk, this remains an option to

¹ Eczema, also referred to as atopic dermatitis (AD), is a common inflammatory skin disorder characterized by recurrent lesions and intense itch. Eczema affects up to 20% of children and 10% of adults. While it can occur at any age, the typical age of onset is between 3 – 6 months (41,42).

consider for families that prefer to not introduce allergenic foods at home. Once potentially allergenic foods have been introduced, they should continue to be offered (23).

WIC staff should encourage WIC families to speak with their healthcare providers (HCP) to discuss their plans for the introduction of potentially allergenic foods, especially those considered to be at risk of developing food allergies. According to a consensus report from the American Academy of Allergy, Asthma, and Immunology (AAAAI) and the Canadian Society for Allergy and Clinical Immunology (CSACI), infants should be considered “at increased risk” for developing a food allergy (or an additional food allergy) if they have mild or moderate eczema, a family history of atopy (a genetic tendency to develop allergic diseases such as asthma, allergic rhinitis, and eczema) in either parents, or who have already been diagnosed with at least one food allergy. Infants should be considered “at the highest risk” for developing a food allergy if they have severe eczema (23).

Management

Food allergies have been shown to produce anxiety and affect quality of life; however, management strategies can help mitigate these negative outcomes. Food allergen avoidance is the safest method for managing food allergies. HCPs should work closely with families to provide education on food allergen avoidance and emergency management plans that are culturally and age appropriate. This includes education on reading food labels and ingredient lists, communicating allergens with people providing food, and the avoidance of any cross-reactive foods, i.e., similar foods within a food group (see Clarification for more information). Emergency management plans are essential for individuals with severe food allergic reactions, such as anaphylaxis. Nutrition counseling and weight and/or growth monitoring is recommended for all individuals with food allergies to ensure a nutritionally adequate diet (1).

Formula fed infants with a documented allergy to cow’s milk protein should be provided with an extensively hydrolyzed protein formula. According to the AAP, soy formulas should not be considered first for infants with a documented allergy to cow’s milk protein since approximately 10 to 14% of infants with a cow’s milk protein allergy also have a soy protein allergy (43). Infants who are partially breastfed or formula fed, with certain non-IgE mediated allergies, such as FPIES and FPIP, may require extensively hydrolyzed casein or amino acid-based formula. WIC nutritionists should refer infants to their HCP if there is a concern of allergy to a formula and follow recommendations made.

Implications for WIC Nutrition Services

Through participant-centered counseling, WIC staff can assist participants with food allergies in making changes that improve quality of life and promote nutritional well-being while avoiding allergenic foods. Based on the needs and interests of the participant, WIC staff can (as appropriate):

- Refer participants diagnosed with severe asthma, eczema, eosinophilic esophagitis (EoE) and exercise-induced anaphylaxis to a HCP for food allergy evaluation, since food allergies often coexist with these conditions (1).
- Facilitate and encourage the participant’s ongoing follow-up with their HCP for optimal management of the food allergy.
- Promote exclusive breastfeeding until six months of age and continuing as long as mutually desired by mother and child for 2 years or beyond (25).
- Provide hypoallergenic formula for participants with appropriate medical documentation, as needed.
- Individually tailor food packages to substitute or remove allergenic foods.

- Educate participants on maintaining adequate nutritional intake while avoiding allergenic foods. Surveys suggest that many individuals with food allergies are allergic to multiple foods. Multiple food allergies increase the level of effort required to avoid the triggering foods, as well as the risk of malnutrition.
- Monitor weight status and growth patterns of participants.
- Educate participants with food allergies on reading food labels and identifying allergenic foods and ingredients. See resources below:
 - <https://www.fda.gov/consumers/consumer-updates/have-food-allergies-read-label> Accessed November
 - <http://www.webmd.com/allergies/foodtriggers>. Accessed November
 - <https://www.foodallergy.org/resources/how-read-food-label>. Accessed November
- Educate participants with food allergies on planning meals and snacks for outside the home.
- Refer participants with suspected sensitivity to foods to their HCP for an oral food challenge of allergenic foods, as appropriate.
- Establish/maintain communication with the participant's HCP.

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Clarification

Self-reporting of a diagnosis by a medical professional should not be confused with self-diagnosis, where a person simply claims to have or to have had a medical condition without any reference to professional diagnosis. A self-reported medical diagnosis (“My doctor says that I have/my son or daughter has...”) should prompt the CPA to validate the presence of the condition by asking more pointed questions related to that diagnosis.

WIC participants diagnosed with a non-immunologic adverse reaction to food should not be assigned risk code 353. For example, risk code 355 should be assigned for those diagnosed with Lactose Intolerance. Code 360 should be assigned for participant diagnosed with conditions including, but not limited to:

- Irritable Bowel Syndrome (IBS)
- Non-celiac wheat sensitivity (NCWS)
- Scombroid Fish Poisoning / Histamine Fish Poisoning
- Caffeine Toxicity

Food allergies are diagnosed by a HCP by evaluating a thorough medical history and conducting a physical exam to consider possible trigger foods to determine the underlying mechanism of the reaction, which guides testing. Along with a detailed history of the disorder, such as symptoms, timing, common triggers and associations, there are several types of tests that the HCP may use in diagnosing food allergies. These include the following:

- Food Elimination Diet
- Oral Food Challenges
- Skin Prick Test (SPT)
- Allergen-specific serum IgE (sIgE)
- Atopy Patch Test

Diagnosing food allergies is difficult because the detection of sIgE does not necessarily indicate a clinical allergy. Often, more than one type of test is required to confirm a diagnosis.