



Fusion Integrative
Health & Wellness, LLC

*Dr. Dana's Ultimate
Guide to*

**ALLERGENS,
INTOLERANCES, AND
DIGESTIVE DISEASES**

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guide to allergens, intolerances, and digestive diseases

Introduction

Adverse food reactions are defined as any abnormal reaction following the ingestion of food.

The different adverse reactions are described as food hypersensitivity, including food intolerance and food allergy.

There are three important types of adverse food reactions:

Immune mediated reactions (involves chemical mediator release)

Food Allergy

- Type 1 hypersensitivity reaction
- Anaphylaxis

Food Sensitivity

- Non-Type 1 hypersensitivity reaction
- "Any other immune mediated (but non-Type 1 hypersensitivity) reaction"
- Not life-threatening

Non-Immune mediated reactions (doesn't involve chemical mediator release)

Food Intolerance

- e.g. lactose intolerance, bile salt deficiency, etc.

There are specific pathophysiological differences between food allergy and food intolerance, resulting in different diagnostic strategies and therapeutic options and are divided according to having an immune basis or not.

food allergies

- The prevalence of food allergies varies affecting 1-2% of adults and less than 10% of children.

Celiac disease

- It is estimated that celiac disease affects 1 in 100 people worldwide.
- Two and one-half million Americans are undiagnosed and are at risk for long-term health complications.
- People with a first-degree relative with celiac disease (parent, child, siblings) have a 1 in 10 risk of developing celiac disease.
- Untreated celiac disease can lead to the development of other autoimmune disorders such as Type 1 diabetes, multiple sclerosis (MS), dermatitis herpetiformis, anemia, infertility and miscarriage, heart disease, and intestinal cancers.

food intolerances

- Food intolerances are estimated to affect up to 20% of the population. However, complete understanding of diagnosis and management is complicated, given presentation and non-immunological mechanisms associated vary.
- Despite the commonality of food intolerance, the diagnosis is often not straightforward and requires an understanding of the varied clinical presentation including severity and timing of symptom onset. This is further complicated by the various mechanisms of food intolerance that can exist, ranging from pharmacological, to enzyme deficiencies, to non-specific gastrointestinal (GI) functioning.



food allergy

Food allergies occur when your body's immune system reacts to a substance in a food, usually a protein, your body sees as harmful. This sets off a chain reaction in the body which may include symptoms occurring within minutes and can range from mild (e.g. itchy eyes, runny nose, etc.) to severe, and can even be life-threatening.

Food allergy is an adverse health effect arising from a specific immune response that occurs reproducibly on exposure to a given food.

- A person's contact with a certain protein causes the body to produce an immunoglobulin E antibody, which can cause a wide range of symptoms which may vary in terms of onset and severity.
- More than 170 foods have been reported to cause IgE-mediated reactions; however, eight foods are responsible for 90 percent of all food allergies (egg, milk, peanuts, tree nuts, wheat, fish, crustacean shellfish and soy).

diagnosis/treatment

If a food allergy is suspected, an in-depth medical history and physical examination should be performed by the provider. A Skin Prick Test may be used to assist in the identification of foods that may provoke a reaction but should not be used alone to diagnose a food allergy. The double-blind, placebo-controlled food challenge is considered the gold standard for diagnosing food allergies.

Types of testing:

- Skin testing (poor for food allergies; 40% positive predictive value; poor in identifying food sensitivities)
- IgE RAST and ELISA testing (more accurate for food allergy [60% accuracy] vs. food sensitivity)

celiac disease

Celiac disease is an autoimmune disease that occurs in people with a genetic predisposition where the ingestion of gluten leads to damage in the small intestine.

When a person with celiac disease eats gluten, an immune response occurs that attacks the small intestine. These attacks lead to damage on the villi (small fingerlike projections that line the small intestine) that promote nutrient absorption. When the villi are damaged, nutrients cannot be absorbed properly into the body.

Celiac disease has some features of a true food allergy as it involves the immune system. Symptoms often include gastrointestinal issues as well as those unrelated to the digestive system (e.g. joint pain, headaches, etc.). However, people with celiac disease are not at risk of anaphylaxis.

Celiac disease can develop at any age after the ingestion of foods or medications that contain gluten.

If left untreated, celiac disease can lead to additional serious health problems.

diagnosis/treatment



Treatment: Currently, the only treatment for celiac disease is lifelong adherence to a strict gluten-free diet.

- Avoid: foods with wheat, rye and barley (e.g. bread and beer)

That said, there are some people who eat gluten and experience symptoms similar to that of celiac disease, but they do not have celiac disease (ruled out by testing). This is also known as non-celiac gluten sensitivity (NCGS). If this is the case, an elimination diet is appropriate.

food intolerance

Food intolerance is different from food allergies in that food intolerances have different causes. An intolerance occurs when the body is unable to digest a certain component of a food (e.g. lactose). Symptoms may be unpleasant, including abdominal cramping, diarrhea, or flatulence, but they are not life-threatening.

Food intolerance is a non-immunological response initiated by a food or food component at a dose normally tolerated and account for most adverse food responses.

Lactose Intolerance

- Lactase, the enzyme that breaks down lactose, is the most prominent sugar found in dairy.
- When dairy is consumed, hydrogen gas (and sometimes methane) is produced and subsequently causes bloating, gas, distention, and abdominal discomfort.
- Additionally, lactic acid may be produced and may cause loose stool and diarrhea.
- Treatment includes avoidance of dairy products, or with lactase treated dairy products, or supplemental enzymes that contain lactase

diagnosis/treatment

Hydrogen Breath Test (lactose intolerance)



food sensitivities

Food and food-chemical sensitivities are highly complex non-allergic, non-celiac inflammatory reactions.

Food sensitivities are complex, non-allergic, non-celiac inflammatory reactions that can involve both innate and adaptive immune pathways.

Across a range of chronic inflammatory conditions, food sensitivities are one of the most important sources of inflammation and symptoms; and are also one of the most challenging to manage, clinically speaking.

Food sensitivities may play a role as a source of inflammation in the following conditions: IBS, migraine, fibromyalgia, arthritis, GERD, obesity, metabolic syndrome, ADD/ADHD, etc.

Food and food-chemical sensitivities have clinical characteristics that can make it challenging to identify trigger foods. For example, symptom manifestation may be delayed by many hours after ingestion; reactions may be dose dependent; because of a breakdown of oral tolerance mechanisms, there are often many reactive foods and food-chemicals; even so-called anti-inflammatory foods, such as salmon, parsley, turmeric, ginger, blueberry, and any “healthy” food can be reactive.

How are food allergies and intolerances different from food sensitivities?

A true food allergy causes an immune system reaction that affects numerous organs in the body and may cause a range of symptoms. In some cases, an allergic food reaction can be severe or life-threatening. In contrast, food intolerance symptoms are generally less serious and often limited to digestive problems.

If a food intolerance is present, a person may be able to eat small amounts of the offending food without trouble. That said, a reaction may be prevented. (e.g. lactose intolerance: drink lactose-free milk or take lactase enzyme pills to aid digestion.)

The difference between a food allergy and sensitivity is the body's response. When a food allergy is present, the immune system causes the reaction. If a food sensitivity or intolerance is present, the reaction is triggered by the digestive system.

Food sensitivities are not life-threatening. There are food intolerances that are not immune-mediated and are instead caused by an inability to process or digest a food. Food sensitivities and intolerances are more common than food allergies and neither involves the immune system.

Symptoms of food sensitivity vary. But the symptoms of intolerance are all digestive-related. These can include: gas and bloating, diarrhea, constipation, cramping, nausea, etc.

common allergens

More than 170 foods are known to cause food allergies. However, eight foods account for 90 percent of all food-allergic reactions in Americans:

Milk

- Casein is a protein found in milk and milk products.
- Milk is a frequent cause of allergy worldwide and accounts for the highest occurrence of food allergy in infancy.
- Reported prevalence in early childhood ranges between 2-6%, but is outgrown in up to 90% of cases by the age of 6 years and affects few adults.
- While milk allergy is associated with an immune reaction against a specific protein, intolerance to milk may result from a (usually) genetically determined inability to metabolize the milk sugar lactose.
- Allergy to milk proteins usually results in a combination of different symptoms often in the gastrointestinal tract, the skin and the airways within the first hour after consumption.
- The broad usage of cow's milk in a large range of different processed food (e.g. baking goods, instant soups, seasonings, chocolate, and margarine) represents a challenge to milk allergic consumer to avoid.

Found in/terms to indicate presence:

- Milk, milk solids, non-fat milk solids, milk powder
- Yogurt, kefir
- Whey
- Cream, sour cream, whipped cream
- Lactose, lactalbumin, lactoglobulin, hydrolysates
- Cheese, cream cheese, cottage cheese
- Butter, artificial butter flavor, butterfat, ghee
- Buttermilk, buttermilk solids
- Casein, caseinate, sodium caseinate, rennet casein, hydrolyzed casein



Egg

- Symptoms of egg allergy are frequently manifested as reactions of the digestive system.
- Major proteins involved in egg allergy are located in the egg white while egg yolk proteins appear to trigger allergic reactions infrequently. Most egg white allergens retain their allergenicity after heating. Individuals sensitized to hens' egg commonly react to eggs of other species as well.
- Individuals with egg allergy need to avoid typical egg-containing foods and often have to avoid many baked goods, mayonnaise, salad dressings, cosmetics, and medical products (e.g. vaccines, hair-care products, etc.).

Found in/terms to indicate presence:

- Albumin
- Egg (protein, white, dried, powdered, yolk)
- Globulin
- Lecithin
- Livetin, lysozyme
- Mayonnaise
- Meringue
- Ovalbumin
- Ovomucoid
- Ovomucin
- Vitellin, ovovitellin



Peanuts

- Current studies suggest that peanut allergy affects about 1% of children and 0.6% of adults in the U.S.
- Symptoms of peanut allergy range from relatively mild and local responses (e.g. in the oral cavity) to life-threatening systemic reactions (e.g. asthma, anaphylaxis) that require emergency treatment.
- Peanut was the first food to be formally examined to establish threshold doses:
 - ≤ 1 mg: lowest reported threshold dose for peanut
 - The difference in levels of threshold dose may related to the preparation method of the peanut source.
 - An average scaled peanut weighs between 500-1000 mg. This means that 1/1000 of a peanut is enough to trigger a reaction in some people.

Found in/terms to indicate presence:

- Peanuts

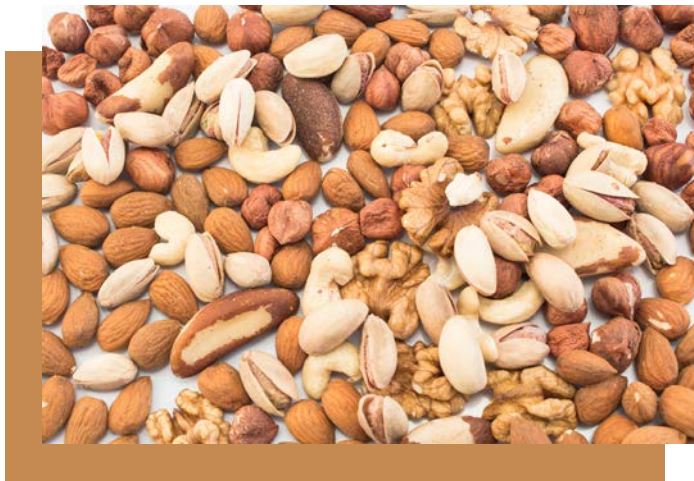


Tree Nuts (including almonds, walnuts and cashews)

- Nuts represent one of the most important groups of allergens worldwide and include Brazil nuts, chestnut, hazelnut, pine nut, walnut, etc. Some fruits and legumes are commonly considered to be nuts (e.g. almond, pecan nuts, coconut, cashew, etc.).
- Nuts are known to be one of the most potent allergenic foods in terms of the amount required to elicit a response and the severity of reactions. Allergy often entails severe multi-systemic and respiratory symptoms and occasionally fatal anaphylactic reactions. However, most frequent symptoms are skin reactions.
- The allergens responsible for nut allergy include seed storage proteins (vicilins, legumins, albumins), plant defense-related proteins and profilins.
- It may be possible to avoid consumption of nut-containing food products, but cross-contamination of manufactured foods can be difficult to manage.
- Since adverse reactions to nuts and peanuts can be triggered by minimal amounts of the food, strict avoidance is imperative.

Found in/terms to indicate presence:

- Almonds
- Brazil nuts
- Cashews
- Chestnuts
- Filberts/hazelnuts
- Macadamia nuts
- Pecans
- Pine nuts, pinole, pignoli, pinon
- Pistachios
- Walnuts



Fish (including pollock, salmon, cod, tuna, snapper, eel, and tilapia)

- Commonly observed symptoms of allergic reactions to fish are skin and gastrointestinal reactions occurring shortly after ingestion. Occasionally, severe systemic reactions including anaphylactic shock are observed.
- Most allergic reactions are caused by the fish muscle protein parvalbumin. Parvalbumin retains its allergenicity even after heating and avoidance of fish-containing foods is essential for sensitive individuals.
- Fish is often present in processed foods such as garnishes, sauces, and soups.

Found in/terms to indicate presence:

- Anchovies
- Bass
- Catfish
- Flounder
- Grouper
- Haddock
- Halibut
- Herring
- Mahi mahi
- Perch
- Pike
- Pollock
- Salmon
- Scrod
- Sole
- Snapper
- Swordfish
- Tilapia
- Trout
- Tuna



Shellfish (including shrimp, lobster & crab)

- Allergies to crustacean and molluscan shellfish seems to predominantly affect older children and adults, especially in regions with a high rate of consumption.
- Symptoms of crustacean and molluscan shellfish allergy range from mild local reactions in the oral cavity to severe life-threatening systemic reactions. Occasionally, gastrointestinal and respiratory symptoms occur.
- Since shellfish retains its allergenic potential even after heating, avoidance of all forms of shellfish is essential.
- Crustacean shellfish may be present in some processed instant foods such as pizza and salad dressings.
- The major allergen of molluscan shellfish is tropomyosin. Individuals developing allergic reactions to one mollusc species often react to other species as well.

Found in/terms to indicate presence:

Crustaceans:

- Crab
- Crawfish, crayfish, ecrevisse
- Lobster, langouste, langoustine, scampo, coral, tamalley
- Shrimp, prawns, crevettes

Mollusks

- Bivalves
 - Oysters, mussels, scallops
- Cephalopods
 - Squids, octopuses
- Gastropods
 - Abalone, limpets, land and marine snails, whelks
- Clam
- Cockle

Soy

- Soybean and its products are widely used in food and food products (e.g. tofu, emulsifiers, texturizers, etc.).
- Symptoms of allergy to soybean are similar to peanut and range from relatively mild reactions to life-threatening reactions.

Found in/terms to indicate presence:

- Edamame
- Hydrolyzed soy protein
- Miso (fermented soy)
- Natto
- Shoyu
- Soy fiber, flour, grits, nuts, powder
- Soy butter, cheese, ice cream, milk, yogurt
- Soy protein isolate
- Soy sauce
- Tamai
- Tempeh
- Textured soy flour (TSF), textured soy protein (TSP), textured vegetable protein (TVP)
- Tofu (silken, firm, dried)
- Soy lecithin

Wheat

- Allergic reactions to wheat and other cereals are most commonly observed in infants and usually resolved within the first several weeks of life.
- Wheat allergy may also include bakers' asthma (occupational exposure to grain flour dust) and, less frequently IgE-mediated allergy associated with exercise, called wheat-dependant exercise-induced anaphylaxis (WDEIA).
- Gluten is the primary storage protein of wheat grains and contains many related proteins (primarily, gliadin and glutenin). These storage proteins are found in rye, barley, and oats and are collectively referred to as 'gluten'.

Found in/terms to indicate presence:

- Bread crumbs
- Bulgur
- Cereal extract
- Couscous
- Durum (durum flour, durum wheat)
- Einkorn
- Emmer
- Farina Flour (all-purpose, cake, enriched, graham, high protein, high gluten, pastry)
- Kamut
- Semolina
- Spelt
- Sprouted wheat
- Triticale
- Vital wheat gluten
- Wheat (bran, germ, gluten, grass, malt, starch)
- Whole wheat berries

gluten

- Gluten is a protein found in wheat, rye and barley.
- Gluten is predominantly found in sources such as pasta, cakes, pastries and biscuits, but can also be used as a binding and extending agent in processed foods.
- Gluten is not considered a common allergen and is not required to be declared. However, wheat is considered a common allergen in the U.S. and must be clearly depicted on packaged food labels.

Found in/terms to indicate presence:

- Barley (malt)
- Brewer's yeast
- Oats (unless specifically labeled gluten-free)
- Rye
- Wheat

common food sensitivities

Food additives and chemicals are thought to contribute to both GI symptoms similar to IBS, as well as extraintestinal symptoms including urticaria, headache, eczema, rhinitis, nasal congestion, or post nasal drip (Source: Barrett, J.S.; Gibson, P.R. Fermentable oligosaccharides, disaccharides, monosaccharides and polyols (FODMAPs) and nonallergic food intolerance: FODMAPs or food chemicals? Therap. Adv. Gastroenterol. 2012, 5, 261–268.)

Examples of food-related chemicals that may induce gastrointestinal and extraintestinal symptoms (and related common food sources):

Food Chemical

Natural food chemicals

- Amines (cheese, chocolate, bananas, ham, fish)
- Glutamate (tomato)
- Salicylates (apples, tomato)

Added food chemicals

- Antioxidants (oils, margarine)
- Benzoates (soft drinks, cordials)
- Colors (confectionary, jelly)
- Monosodium glutamate (MSG) (Chinese take-out, packaged foods)
- Nitrates (deli meats)
- Propionates (bread)
- Sorbic acid (processed cheese slices)
- Sulfites (soft drinks, cordials, dried fruit)

*Note: This is not a complete list of all possible natural/added food chemicals.

checking ingredient labels

Label reading is considered one of the important focus areas for the RDN when providing education to patients with food allergies. It is very important to emphasize on how to interpret the ingredients on food labels. If a food label contains precautionary labeling, such as "this product may contain trace amounts of allergen," the food should be avoided.

gluten

- Check for obvious ingredients
 - Wheat, barley, rye, malt, brewer's yeast, oats (uncles specifically labeled gluten-free)
- If a product claims to be gluten-free on the package, then it is most likely safe to eat as the FDA only allows packaged foods with less than 20ppm of gluten to be labeled "gluten-free." However, you should still check the ingredients list. It is also important to remember that "wheat-free" does not necessarily mean "gluten-free."
- If there is not a "gluten-free" label on the product packaging, read the ingredients label thoroughly. Check for hidden or questionable ingredients. Some ingredients have the potential to contain gluten.





Food Allergen Advisory Labeling:

How major food allergens are listed:

- The law requires that food labels identify the food source names of all major food allergens used to make the food. This requirement is met if the common or usual name of an ingredient (e.g., buttermilk) that is a major food allergen already identifies that allergen's food source name (i.e., milk). Otherwise, the allergen's food source name must be declared at least once on the food label in one of two ways.
 - The name of the food source of a major food allergen must appear in one of two ways:
 - In parentheses following the name of the ingredient
 - e.g. "lecithin (soy)," "flour (wheat)," and "whey (milk)"
 - Immediately after or next to the list of ingredients in a "contains" statement
 - e.g. "Contains Wheat, Milk, and Soy."
- FALCPA's labeling requirements do not apply to the potential or unintentional presence of major food allergens in foods resulting from "cross-contact" situations during manufacturing.
- "Cross-contact" occurs when a residue or trace amount of an allergenic food becomes incorporated into another food not intended to contain it.
- FDA guidance for the food industry states that food allergen advisory statements, e.g., "may contain [allergen]" or "produced in a facility that also uses [allergen]" should not be used as a substitute for adhering to current good manufacturing practices and must be truthful and not misleading.



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learning more?

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