



# Food Additives and Allergies/Intolerances

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Food additives are used for a variety of reasons, including improving flavor or texture, boosting nutritional value and maintaining product safety from production to the pantry. The safety and efficacy of additives are overseen by the [U.S. Food and Drug Administration \(FDA\)](#).



While there are documented cases of adverse reactions to certain additives, these are typically not related to an immune-system response and therefore less severe than typical allergic reactions. True allergic reactions, including anaphylaxis, are very rare to most additives.



According to the American Academy of Allergy, Asthma and Immunology (AAAAI), there are studies that show adverse reactions to additives, but most reports are of single patients (or small clusters of patients) and are related to dyes and sulfites.

## How are additives labeled?

The FDA requires manufacturers to list all ingredients, in order of predominance, on the label. The label must also list the names of any FDA-certified color additives, but some ingredients can be listed jointly as “natural flavors,” “spices,” or “artificial flavoring” if they are dubbed to be “generally recognized as safe” (GRAS) by the FDA. This also applies to “artificial colors” if the color additive(s) is exempt from certification.

If an additive contains any allergen covered by the Food Allergen Labeling Consumer Protection Act (FALCPA)—a list that presently includes egg, milk, peanut, tree nut, soy, wheat, fish, and shellfish—the allergen must be stated on the label. Because there may be recipe or formulary changes at any time, it’s important for people with allergies to read labels every time. (Learn more about FALCPA at [foodallergy.org](#).)

## What’s the difference between a food allergy and an intolerance/sensitivity?

A food intolerance is a reaction to food that does not involve the immune system but might involve the digestive system causing gas, bloating, diarrhea, and upset stomach. This occurs when a person is unable to properly break down the food. This could be due to enzyme deficiencies (e.g., no lactase enzyme to breakdown lactose) or adverse reactions to naturally occurring chemicals in foods or additives.

A food allergy involves the immune system. When a person eats a food that he/she is allergic to, the immune system overreacts by producing antibodies called Immunoglobulin E (IgE) to proteins in food. These antibodies travel to cells that release chemicals, causing an allergic reaction. Unlike an intolerance to food, a food allergy can cause a serious, and even life-threatening, reaction, anaphylaxis.

## How do I know if I’m reacting to a food additive?

If you have reactions to multiple unrelated foods, or only with processed foods, a food additive may be the culprit.

## What should I do if I believe I had an adverse reaction to a food additive?

Discuss your symptoms and any reaction trends with your primary care physician or an allergist. Keeping a food diary may help pinpoint troublesome ingredients. A skin test has little diagnostic value in determining an allergy to a food additive. The gold standard is strict ingredient avoidance followed by an oral food challenge. This is the most effective way to determine the root cause of adverse reactions.<sup>1</sup>

<sup>1</sup> Wilson BG, Bahna SL. Adverse reactions to food additives. *Ann Allergy Asthma Immunol.* 2005;95(6):499-570. doi:10.1016/S1081-1206(10)61010-1

Below is list of some common food additives and information about their relationship to allergic reactions and intolerances/sensitivities. If you suspect you are having an adverse reaction to any ingredient, consult a medical professional.

## FLAVOR ENHANCERS

Flavor enhancers are present in many processed foods. These additives enhance flavors already present in foods, without providing their own separate flavor, and can often be natural.

**Hydrolyzed vegetable protein**, used by the food industry to enhance flavor, is protein that has been chemically broken apart into amino acids. It is widely used in processed savory food. It can also be found in personal care products. It is typically made with soy, wheat and/or corn so it must be avoided by people with IgE-mediated allergy to those ingredients.

**Monosodium glutamate**, better known as MSG, is a seasoning that combines sodium with glutamate, the most abundant amino acid in nature and one that provides “umami,” a savory taste. Tomatoes, parmesan cheese, soybeans, and seaweed are sources of glutamate, and the body metabolizes added MSG in the same way as it does the glutamate in these foods. Today, MSG is produced by the fermentation of plant-based sources like corn, sugar beets, sugar cane or molasses, and it can be purchased for at-home cooking. There are no reported cases of IgE-mediated allergy to MSG. Although some people identify themselves as sensitive to MSG, in studies with such individuals given MSG or a placebo, scientists have not been able to consistently trigger reactions.<sup>2</sup>

## ARTIFICIAL COLORING/DYES

These additives are used to offset color loss during production from exposure to light, air, temperature extremes, moisture, and storage conditions, as well as to enhance colors and provide color to colorless foods. They are usually found in candies, margarine, cheese, soft drinks, jams/jellies, gelatins, puddings and pie fillings.

**Annatto** is an orange food coloring made from the seeds of a South American tree, Bixa orellana. This additive has been found to cause allergic reactions, including anaphylaxis and hives/swelling.

**Carmine** is a red food coloring made from a dried insect called *Dactylopius coccus* Costa. This coloring is found in various drinks, red yogurt, and popsicles. Reactions to carmine include anaphylaxis.

**Tartrazine** is also known as FD&C Yellow No. 5. In 1986, The FDA’s Committee on Hypersensitivity to Food Constituents concluded that Tartrazine may cause hives in fewer than one out of 10,000 people.<sup>3</sup>

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<sup>2</sup> Questions and Answers on Monosodium glutamate (MSG). U.S. Food and Drug Administration. Web site. <https://www.fda.gov/food/food-additives-petitions/questions-and-answers-monosodium-glutamate-msg>. 2012.

<sup>3</sup> Overview of Food Ingredients, Additives and Colors. U.S. Food and Drug Administration. Web site. <https://www.fda.gov/food/food-ingredients-packaging/overview-food-ingredients-additives-colors#qayellow5>. 2010.

# EMULSIFIERS

Emulsifiers allow for smooth mixing of ingredients and prevent separation. They are found in such products as salad dressings, peanut butter, chocolate, margarine, ice cream and plant-based milk alternatives.

**Lecithin** is an emulsifier made from soybeans or eggs and therefore may contain those allergenic proteins. However, allergic reactions to soy lecithin are rare, even in those allergic to soy, as concentration is typically low in most foods.<sup>4</sup>

## STABILIZERS AND THICKENERS

These additives make a food's texture and consistency uniform and improve the way the food feels in a person's mouth. Products containing stabilizers or thickeners include frozen desserts, dairy, dairy alternatives, cakes, pudding/gelatin mixes, dressings, jams/jellies and commercial sauces.

**Carrageenan** is the extract from a red seaweed commonly known as Irish moss, which is native to the British Isles. It has been reported to cause adverse gastrointestinal effects but reports of IgE-mediated allergy are rare.<sup>5</sup>

**Guar gum** is made from seed of the guar plant and is high in fiber. This additive can trigger a rare allergic reaction and/or rhinitis, and there have been cases of occupational asthma in people working directly with the product.<sup>6</sup> Guar gum can also cause digestive symptoms, including gas and bloating.

**Xanthan gum** is a sugar-like compound made by mixing fermented sugars with a certain kind of bacteria. It's often used as a binder in gluten-free products. Some people may develop gastrointestinal symptoms, such as bloating, gas and diarrhea.

## pH CONTROL AGENTS

These additives prevent spoilage and control acidity and alkalinity in beverages, frozen desserts, chocolate, canned or jarred foods and baking powder.

**Citric acid** is added to products to boost flavor, blend ingredients and prevent botulism in canned foods. While citric acid naturally exists in some fruits and vegetables, like lemon and tomato, it's manufactured citric acid (MCA) that is used extensively as an additive, especially in soft drinks and candies. People can have food allergy to citrus fruits, like orange and grapefruit, but these reactions are unrelated to MCA. However, there are some documented cases of citric acid intolerance.<sup>7</sup>

**Lactic acid** is produced when specific bacteria feed off sugars and is also a natural chemical in the body. It occurs naturally in fermented foods, such as sauerkraut, kimchi, yogurt, and sourdough bread, but can also be manufactured and added to packaged foods as a preserving agent. While the word "lactic" may suggest that a product contains milk, lactic acid is not always made from milk. However, lactic acid starter cultures may contain milk. There are several additives that contain the word "calcium" or that start with "lact" that lead people to believe a product has milk in it when it may not. These include calcium lactate, calcium stearoyl lactylate, sodium lactate, and sodium stearoyl lactylate. Be sure to read the full ingredients list or call the manufacturer if you have further questions.

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<sup>4</sup> Institute of Agriculture and Natural Resources, Food Allergy Research and Resource Program. [Soy lecithin, soybeans and soy lecithin](#). Updated August 7, 2019.

<sup>5</sup> H. Kular, J. Dean, V. Cook, A case of carrageenan allergy in a pediatric patient, *Annals of Allergy, Asthma & Immunology*, Volume 121, Issue 5, Supplement, 2018, Page S119, ISSN 1081-1206, <https://doi.org/10.1016/j.anai.2018.09.395>.

<sup>6</sup> Lagier F, Cartier A, Somer J, Dolovich J, Malo JL. Occupational asthma caused by guar gum. *J Allergy Clin Immunol*. 1990;85(4):785-790. doi:10.1016/0091-6749(90)90199-e

<sup>7</sup> Sweis IE, Cressey BC. Potential role of the common food additive manufactured citric acid in eliciting significant inflammatory reactions contributing to serious disease states: A series of four case reports. *Toxicol Rep*. 2018;5:808-812. Published 2018 Aug 9. doi:10.1016/j.toxrep.2018.08.002

## PRESERVATIVES

In addition to slowing or preventing changes in color, flavor or texture, preservatives prevent food spoilage caused by organisms such as bacteria, molds and yeasts. Preservatives are found in fruit sauces and jellies, beverages, baked goods, cured meats, oils, margarines, cereals, dressings, snack foods, and processed fruits and vegetables.

**Nitrates/nitrites** are used to extend shelf life and preserve foods by inhibiting growth of organisms, which can sometimes be deadly. They are also added to enhance flavors and color in packaged foods. Most nitrates in the diet occur naturally in dark leafy green vegetables. Nitrates and nitrites are commonly found in processed meats, such as hot dogs or deli meats like bologna and salami. There are reported cases of hives and itching, as well as anaphylaxis, related to nitrate.

**Sulfites** are also used to delay spoilage, such as preventing browning in fresh fruit or vegetables, and to extend shelf life, as in the production of dried fruit. Sulfites are often contained in beer and wine, but not clear alcohol such as vodka. Asthma exacerbations, anaphylaxis and hives are all reported reactions to sulfites; however, the FDA only requires labeling on any food or beverage with a concentration greater than 10 parts per million.

**The bottom line? There are more than 3,000 food additives listed on the FDA site. Though there is a rigorous approval process for the safety of additives, some people may be sensitive to certain ingredients and, in some cases, experience an allergic reaction.**

**Remember to read all ingredient labels every time and reach out to manufacturers if you have any questions. If you believe you experienced an adverse reaction to an ingredient, consult with a board-certified physician, ideally an allergist.**



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