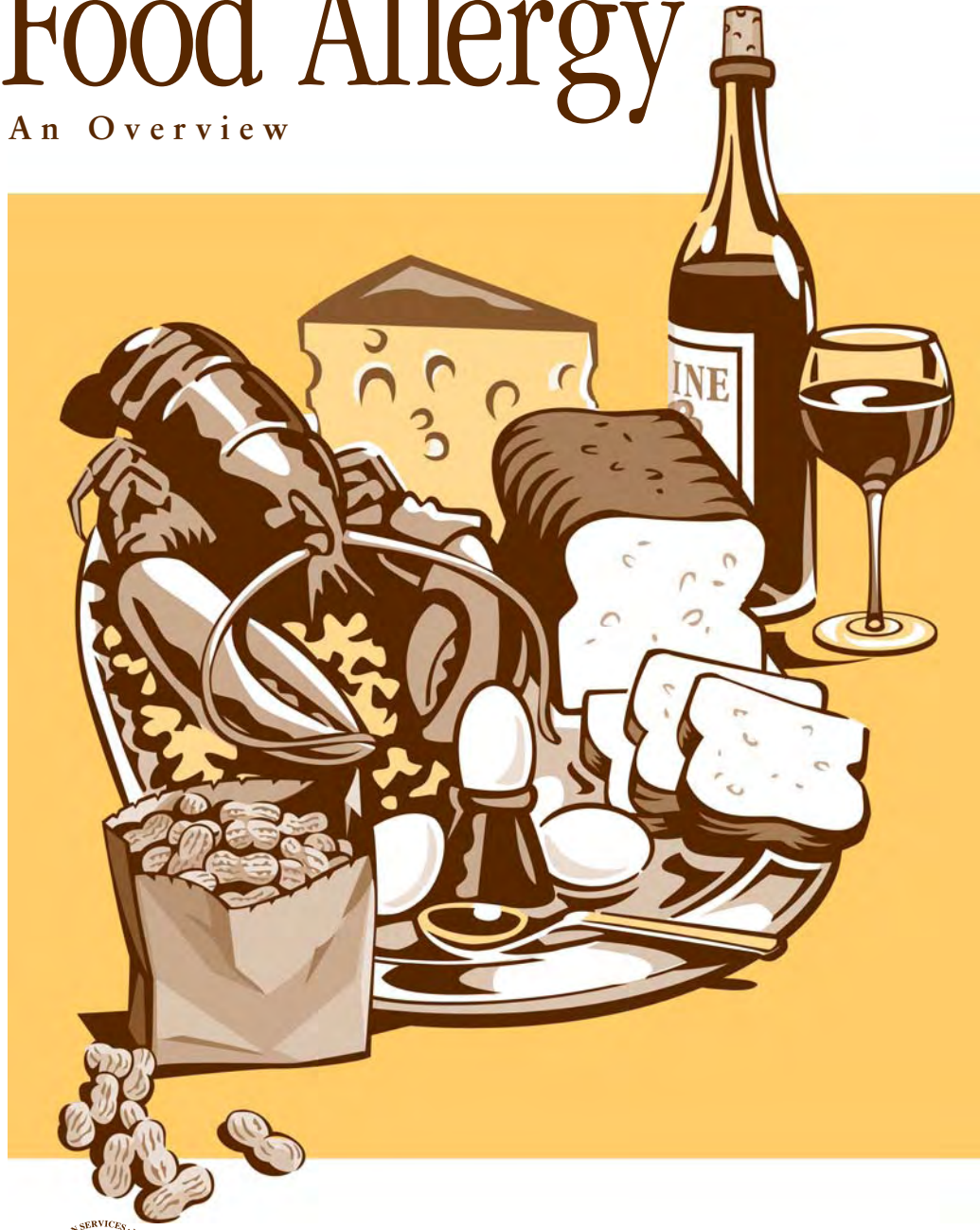
NIAID HEALTH INFO

Food Allergy

An Overview



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health

National Institute of Allergy and Infectious Diseases

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Introduction

Food allergy affects up to 6 to 8 percent of children under the age of 3 and close to 4 percent of adults. If you have an unpleasant reaction to something you have eaten, you might wonder if you have a food allergy. One out of three people either believe they have a food allergy or modify their or their family's diet. Thus, while food allergy is commonly suspected, healthcare providers diagnose it less frequently than most people believe.

This pamphlet describes allergic reactions to foods and their possible causes as well as the best ways to diagnose and treat allergic reactions to food. It also describes other reactions to foods, known as food intolerances, which can be confused with food allergy, and describes some unproven and controversial food allergy theories.

What Is Food Allergy?

Food allergy is an abnormal response to a food triggered by the body's **immune system.** In this pamphlet, food allergy refers to a particular type of response of the immune system in which the body produces what is called an allergic, or IgE, **antibody** to a food. (IgE, or **immunoglobulin** E, is a type of protein that works against a specific food.)

Allergic reactions to food can cause serious illness and, in some cases, death. Therefore, if you have a food allergy, it is extremely important for you to work with your healthcare provider to find out what food(s) causes your allergic reaction.

Sometimes, a reaction to food is not an allergy at all but another type of reaction called "food intolerance."

Food intolerance is more common than food allergy. The immune system does not cause the symptoms of food intolerance, though these symptoms may look and feel like those of a food allergy.

*Note: Words in **bold** are defined in the glossary at the end of this booklet.*

How Do Allergic Reactions Work?

An immediate allergic reaction involves two actions of your immune system

- Your immune system produces IgE. This protein is called a food-specific antibody, and it circulates through your blood.
- The food-specific IgE then attaches to **mast cells** and **basophils.** Basophils are found in blood. Mast cells are found in body tissues, especially in areas of your body that are typical sites of allergic reactions. Those sites include your nose, throat, lungs, skin, and **gastrointestinal (GI) tract.**

Generally, your immune system will form IgE against a food if you come from a family in which allergies are common —not necessarily food allergies but perhaps other allergic diseases, such as hay fever or asthma. If you have two allergic parents, you are more likely to develop food allergy than someone with one allergic parent.

If your immune system is inclined to form IgE to certain foods, you must be exposed to the food before you can have an allergic reaction.

As this food is digested, it triggers certain cells in your body to produce a food-specific IgE in large amounts. The food-specific IgE is then released and attaches to the surfaces of mast cells and basophils.

- The next time you eat that food, it interacts with food-specific IgE on the surface of the mast cells and basophils and triggers those cells to release chemicals such as **histamine.**

- Depending on the tissue in which they are released, these chemicals will cause you to have various symptoms of food allergy.

Food **allergens** are proteins in the food that enter your bloodstream after the food is digested. From there, they go to target organs, such as your skin or nose, and cause allergic reactions.

An allergic reaction to food can take place within a few minutes to an hour. The process of eating and digesting food affects the timing and the location of a reaction.

- If you are allergic to a particular food, you may first feel itching in your mouth as you start to eat the food.
- After the food is digested in your stomach, you may have GI symptoms such as vomiting, diarrhea, or pain.
- When the food allergens enter and travel through your bloodstream, they may cause your blood pressure to drop.
- As the allergens reach your skin, they can cause hives or eczema.
- When the allergens reach your mouth and lungs, they may cause throat tightness and trouble breathing.

Cross-Reactive Food Allergies

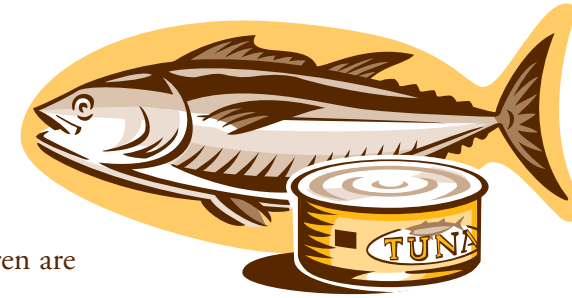
If you have a life-threatening reaction to a certain food, your healthcare provider will show you how to avoid similar foods that might trigger this reaction. For example, if you have a history of allergy to shrimp, allergy testing will usually show that you are not only allergic to shrimp but also to crab, lobster, and crayfish. This is called "cross-reactivity."

Another interesting example of cross-reactivity occurs in people who are highly sensitive to ragweed. During ragweed pollen season, they sometimes find that when they try to eat melons, particularly cantaloupe, they experience itching in their mouths and simply cannot eat the melon. Similarly, people who have severe birch pollen allergy also may react to apple peels. This is called the "oral allergy syndrome."

Common Food Allergies

In adults, the foods that most often cause allergic reactions include

- Shellfish such as shrimp, crayfish, lobster, and crab
- Peanuts
- Tree nuts such as walnuts
- Fish
- Eggs



The most common foods that cause problems in children are

- Eggs
- Milk
- Peanuts
- Tree nuts

Peanuts and tree nuts are the leading causes of the potentially deadly food allergy reaction called **anaphylaxis.**

Adults usually keep their allergies for life, but children sometimes outgrow them. Children are more likely to outgrow allergies to milk, egg, or soy, however, than allergies to peanuts. The foods to which adults or children usually react are those foods they eat often. In Japan, for example, rice allergy is frequent. In Scandinavia, codfish allergy is common.

Food Allergy or Food Intolerance?

If you go to your healthcare provider and say, "I think I have a food allergy," your provider has to consider other possibilities that may cause symptoms and could be confused with food allergy, such as food intolerance. To find out the difference between food allergy and food intolerance, your provider will go through a list of possible causes for your symptoms. This is called a "differential diagnosis." This type of diagnosis helps confirm that you do indeed have a food allergy rather than a food intolerance or other illness.

Types of Food Intolerance

Food poisoning

One possible cause of symptoms like those of food allergy is food contaminated with **microbes,** such as **bacteria,** and bacterial products, such as **toxins.** Contaminated meat and dairy products sometimes cause symptoms, including GI discomfort, that resemble a food allergy when it is really a type of food poisoning.

Histamine toxicity

There are substances, such as the powerful chemical histamine, present in certain foods that cause a reaction similar to an allergic reaction. For example, histamine can reach high levels in cheese, some wines, and certain kinds of fish such as tuna and mackerel.

In fish, histamine is believed to come from contamination by bacteria, particularly in fish that are not refrigerated properly. If you eat one of these foods with a high level of histamine,

you could have a reaction that strongly resembles an allergic reaction to food. This reaction is called **"histamine toxicity."**

Lactose intolerance

Another cause of food intolerance confused with a food allergy is **lactose intolerance** or lactase deficiency. This common food intolerance affects at least 1 out of 10 people.

Lactase is an **enzyme** that is in the lining of your gut. Lactase breaks down or digests lactose, a sugar found in milk and most milk products.

Lactose intolerance, or lactase deficiency, happens when there is not enough lactase in your gut to digest lactose. In that case, bacteria in your gut use lactose to form gas which causes bloating, abdominal pain, and sometimes diarrhea.

Your healthcare provider can use laboratory tests to find out whether your body can digest lactose.

Food additives

Another type of food intolerance is a reaction to certain products that are added to food to enhance taste, provide color, or protect against the growth of microbes. Several chemical compounds, such as MSG (monosodium glutamate) and sulfites, are tied to reactions that can be confused with food allergy.

MSG

MSG is a flavor enhancer and, when taken in large amounts, can cause some of the following signs:

- Flushing
- Sensations of warmth
- Headache
- Chest discomfort
- Feelings of detachment

These passing reactions occur rapidly after eating large amounts of food to which MSG has been added.

Sulfites

Sulfites occur naturally in foods or may be added to increase crispness or prevent mold growth.

Sulfites in high concentrations sometimes pose problems for people with severe asthma. Sulfites can give off a gas called sulfur dioxide that a person with asthma inhales while eating food containing sulfites. This gas irritates the lungs and can send an asthmatic into severe bronchospasm, a tightening of the lungs.

The Food and Drug Administration (FDA) has banned sulfites as spray-on preservatives in fresh fruits and vegetables. Sulfites are still used in some foods, however, and occur naturally during the fermentation of wine.

Gluten intolerance

Gluten intolerance is associated with the disease called "gluten-sensitive enteropathy" or **"celiac disease."** It happens if your immune system responds abnormally to gluten, which is a part of wheat and some other grains. Some researchers include celiac disease as a food allergy. This abnormal immune system response, however, does not involve IgE antibody.

Psychological causes

Some people may have a food intolerance that has a psychological trigger. If your food intolerance is caused by this type of trigger, a careful psychiatric evaluation may identify an unpleasant event in your life, often during childhood, tied to eating a particular food. Eating that food years later, even as an adult, is associated with a rush of unpleasant sensations.

Other causes

There are several other conditions, including ulcers and cancers of the GI tract, that cause some of the same symptoms as food allergy. These symptoms include vomiting, diarrhea, and cramping abdominal pain made worse by eating.

Diagnosis

After ruling out food intolerances and other health problems, your healthcare provider will use several steps to find out if you have an allergy to specific foods.

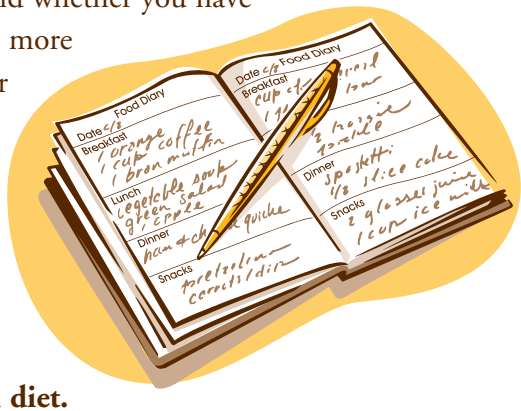
Detailed History

A detailed history is the most valuable tool for diagnosing food allergy. Your provider will ask you several questions and listen to your history of food reactions to decide if the facts fit a food allergy.

- What was the timing of your reaction?
- Did your reaction come on quickly, usually within an hour after eating the food?
- Did allergy medicines help? Antihistamines should relieve hives, for example.
- Is your reaction always associated with a certain food?
- Did anyone else who ate the same food get sick? For example, if you ate fish contaminated with histamine, everyone who ate the fish should be sick.
- How much did you eat before you had a reaction? The severity of a reaction is sometimes related to the amount of food eaten.
- How was the food prepared? Some people will have a violent allergic reaction only to raw or undercooked fish. Complete cooking of the fish may destroy the allergen, and they can then eat it with no allergic reaction.
- Did you eat other foods at the same time you had the reaction? Some foods may delay digestion and thus delay the start of the allergic reaction.

Diet Diary

Sometimes your healthcare provider can't make a diagnosis solely on the basis of your history. In that case, you may be asked to record what you eat and whether you have a reaction. This diet diary gives more detail from which you and your provider can see if there is a consistent pattern in your reactions.



Elimination Diet

The next step some healthcare providers use is an **elimination diet.** In this step, which is done under your provider's direction, certain foods are removed from your diet.

- You don't eat a food suspected of causing the allergy, such as eggs.
- You then substitute another food—in the case of eggs, another source of protein.

Your provider can almost always make a diagnosis if the symptoms go away after you remove the food from your diet. The diagnosis is confirmed if you then eat the food and the symptoms come back. You should do this only when the reactions are not significant and only under healthcare provider direction.

Your provider can't use this technique, however, if your reactions are severe or don't happen often. If you have a severe reaction, you should not eat the food again.

Skin Test

If your history, diet diary, or elimination diet suggests a specific food allergy is likely, your healthcare provider will then use either the scratch or the prick skin test to confirm the diagnosis.

During a scratch skin test, your healthcare provider will place an **extract** of the food on the skin of your lower arm. Your provider will then scratch this portion of your skin with a needle and look for swelling or redness, which would be a sign of a local allergic reaction.

A prick skin test is done by putting a needle just below the surface of your skin of the lower arm. Then, a tiny amount of food extract is placed under the skin.

If the scratch or prick test is positive, it means that there is IgE on the skin's mast cells that is specific to the food being tested. Skin tests are rapid, simple, and relatively safe.

You can have a positive skin test to a food allergen, however, without having an allergic reaction to that food. A healthcare provider diagnoses a food allergy only when someone has a positive skin test to a specific allergen and when the history of reactions suggests an allergy to the same food.

Blood Test

Your healthcare provider can make a diagnosis by doing a blood test as well. Indeed, if you are extremely allergic and have severe anaphylactic reactions, your provider can't use skin testing because causing an allergic reaction to the skin

test could be dangerous. Skin testing also can't be done if you have eczema over a large portion of your body.

Your healthcare provider may use blood tests such as the RAST (radioallergosorbent test) and newer ones such as the CAP-RAST. Another blood test is called ELISA (enzyme-linked immunosorbent **assay**). These blood tests measure the presence of food-specific IgE in your blood. The CAP-RAST can measure how much IgE your blood has to a specific food. As with skin testing, positive tests do not necessarily mean you have a food allergy.

Double-Blind Oral Food Challenge

The final method healthcare providers use to diagnose food allergy is double-blind oral food **challenge.**

- Your healthcare provider will give you capsules containing individual doses of various foods, some of which are suspected of starting an allergic reaction. Or your provider will mask the suspected food within other foods known not to cause an allergic reaction.
- You swallow the capsules one at a time or swallow the masked food and are watched to see if a reaction occurs.

In a true double-blind test, your healthcare provider is also "blinded" (the capsules having been made up by another medical person). In that case your provider does not know which capsule contains the allergen.

The advantage of such a challenge is that if you react only to suspected foods and not to other foods tested, it confirms

the diagnosis. You cannot be tested this way if you have a history of severe allergic reactions.

In addition, this testing is difficult because it takes a lot of time to perform and many food allergies are difficult to evaluate with this procedure. Consequently, many healthcare providers do not perform double-blind food challenges.

This type of testing is most commonly used if a healthcare provider thinks the reaction described is not due to a specific food and wishes to obtain evidence to support this. If your provider finds that your reaction is not due to a specific food, then additional efforts may be used to find the real cause of the reaction.

Treatment

Food allergy is treated by avoiding the foods that trigger the reaction. Once you and your healthcare provider have identified the food(s) to which you are sensitive, you must remove them from your diet. To do this, you must read the detailed ingredient lists on each food you are considering eating.

Many allergy-producing foods such as peanuts, eggs, and milk, appear in foods one normally would not associate them with. Peanuts, for example, may be used as a protein source, and eggs are used in some salad dressings.

Because of a new law in the United States, FDA now requires ingredients in a packaged food to appear on its label. You can avoid most of the things to which you are sensitive if you read food labels carefully and avoid restaurant-prepared foods that might have ingredients to which you are allergic.

If you are highly allergic, even the tiniest amounts of a food allergen (for example, a small portion of a peanut kernel) can prompt an allergic reaction.

If you have food allergies, you must be prepared to treat unintentional exposure. Even people who know a lot about what they are sensitive to occasionally make a mistake. To protect yourself if you have had allergic reactions to a food, you should

- Wear a medical alert bracelet or necklace stating that you have a food allergy and are subject to severe reactions
- Carry an auto-injector device containing **epinephrine** (adrenaline), such as an epipen or twinject, that you can get by prescription and give to yourself if you think you are getting a food allergic reaction

- Seek medical help immediately, even if you have already given yourself epinephrine, by either calling the rescue squad or by getting transported to an emergency room

Anaphylactic allergic reactions can be fatal even when they start off with mild symptoms such as a tingling in the mouth and throat or GI discomfort.

Exercise-Induced Food Allergy

At least one situation may require more than simply eating food with allergens to start a reaction: exercise-induced food allergy. People who have this reaction only experience it after eating a specific food before exercising. Some people get this reaction from many foods, and others get it only after eating a specific food. As exercise increases and body temperature rises, itching and light-headedness start and allergic reactions such as hives may appear and even anaphylaxis may develop.

The management of exercised-induced food allergy is simple—avoid eating for a couple of hours before exercising.

Schools and daycare centers must have plans in place to address any food allergy emergency. Parents and caregivers should take special care with children and learn how to

- Protect children from foods to which they are allergic
- Manage children if they eat a food to which they are allergic
- Give children epinephrine

Simply washing your hands with soap and water will remove peanut allergens. Also, most household cleaners will remove them from surfaces such as food preparation areas at home as well as daycare facilities and schools. These easy-to-do measures will help prevent peanut allergy reactions in children and adults.

There are several medicines you can take to relieve food allergy symptoms that are not part of an anaphylactic reaction. These include

- Antihistamines to relieve GI symptoms, hives, or sneezing and a runny nose
- Bronchodilators to relieve asthma symptoms

It is not easy to determine if a reaction to food is anaphylactic, however. It is important to develop a plan with a healthcare provider as to what reactions you should treat with epinephrine first, rather than antihistamines or bronchodilators.

Food Allergy in Infants and Children

Allergy to cow's milk is particularly common in infants and young children. It causes hives and asthma in some children. In others, it can lead to colic and sleeplessness, and perhaps blood in the stool or poor growth. Infants are thought to be particularly susceptible to this allergic syndrome because their immune and digestive systems are immature. Milk allergy can develop within days to months of birth.

If your baby is on cow's milk formula, your healthcare provider may suggest a change to soy formula or an elemental formula if possible. Elemental formulas are produced from processed proteins with supplements added (basically sugars and **amino acids**). There are few if any allergens within these materials.

Healthcare providers sometimes prescribe **glucocorticosteroid** medicines to treat infants with very severe GI reactions to milk formulas. Fortunately, this food allergy tends to go away within the first few years of life.

Breast feeding often helps babies avoid feeding problems related to allergic reactions. Therefore, health experts often suggest that mothers feed their baby only breast milk for the first months of life to avoid milk allergy from developing within that timeframe.

Some babies are very sensitive to a certain food. If you are nursing and eat that food, sufficient amounts can enter your breast milk to cause a food reaction in your baby. To keep possible food allergens out of your breast milk, you might try not eating those foods, such as peanuts, that could cause an allergic reaction in your baby.

There is no conclusive evidence that breastfeeding prevents allergies from developing later in your child's life. It does, however, delay the start of food allergies by delaying your infant's exposure to those foods that can prompt allergies. Plus, it may avoid altogether food allergy problems sometimes seen in infants.

By delaying the introduction of solid foods until your baby is 6 months old or older, you can also prolong your baby's allergy-free period. Speak to your healthcare provider for specific instructions on when to add specific food groups to your child's diet.

Some Controversial and Unproven Theories

Controversial and Unproven Disorders

There are several disorders that are popularly thought by some to be caused by food allergies. Either there is not enough scientific evidence to support those claims, or there is evidence that goes against such claims.

Migraine headaches

There is controversy about whether migraine headaches can be caused by food allergy. Studies show people who are prone to migraines can have their headaches brought on by histamine and other substances in foods. The more difficult issue is whether food allergies actually cause migraines in such people.

Arthritis

There is virtually no evidence that most rheumatoid arthritis or osteoarthritis can be made worse by foods, despite claims to the contrary.

Allergic tension fatigue syndrome

There is no evidence that food allergies can cause a disorder called the allergic tension fatigue syndrome, in which people are tired, nervous, and may have problems concentrating or have headaches.

Cerebral allergy

Cerebral allergy is a term that has been given to people who have trouble concentrating and have headaches as well as other complaints. These symptoms are sometimes blamed on mast cells activated in the brain but no other place in the body. Researchers have found no evidence that such a scenario can happen. Most health experts do not recognize cerebral allergy as a disorder.

Environmental illness

In a seemingly pristine environment, some people have many nonspecific complaints such as problems concentrating or depression. Sometimes this is blamed on small amounts of allergens or toxins in the environment. There is no evidence that these problems are due to food allergies.

Childhood hyperactivity

Some people believe hyperactivity in children is caused by food allergies. Researchers, however, have found that this behavioral disorder in children is only occasionally associated with food additives, and then only when such additives are consumed in large amounts.

There is no evidence that a true food allergy can affect a child's activity except for the possibility that if a child itches and sneezes and wheezes a lot, the child may be uncomfortable and therefore more difficult to guide. Also, children who are on anti-allergy medicines that cause drowsiness may get sleepy in school or at home.

Controversial and Unproven Diagnostic Methods

Cytotoxicity testing

One controversial diagnostic technique is **cytotoxicity testing,** in which a food allergen is added to a blood sample. A technician then examines the sample under the microscope to see if white cells in the blood "die." Scientists have evaluated this technique in several studies and have found it does not effectively diagnose food allergy.

Provocative challenge

Another controversial approach is called sublingual (placed under the tongue) or subcutaneous (injected under the skin) **provocative challenge.** In this procedure, diluted food allergen is put under your tongue if you feel that your arthritis, for instance, is due to foods. The technician then asks you if the food allergen has made your arthritis symptoms worse. In clinical studies, researchers have not shown that this procedure can effectively diagnose food allergy.

Sublingual provocative challenge is not the same as a potentially new treatment for food allergy called sublingual immunotherapy or SLIT. Researchers are currently evaluating this treatment.

Immune complex assay

An immune complex assay is sometimes done on people suspected of having food allergies to see if groups, or complexes, of certain antibodies connect to the food allergen in the bloodstream. Some think that these immune groups link with

food allergies. The formation of such immune complexes is a normal offshoot of food digestion, however, and everyone, if tested with a sensitive-enough measurement, has them. To date, no one has conclusively shown that this test links with allergies to foods.

IgG subclass assay

Another test is the IgG subclass assay, which looks specifically for certain kinds of IgG antibody. Again, there is no evidence that this diagnoses food allergy.

Controversial and Unproven Treatments

One controversial treatment, which sometimes may be used with provocative challenge, includes putting a diluted solution of a particular food under your tongue about a half hour before you eat the food suspected of causing an allergic reaction. This is an attempt to "neutralize" the subsequent exposure to the food you believe is harmful. The results of carefully conducted clinical research show this procedure does not prevent an allergic reaction.

Allergy shots

Another unproven treatment involves getting allergy shots (immunotherapy) containing small quantities of the food extracts to which you are allergic. These shots are given regularly for a long period of time with the aim of "desensitizing" you to the food allergen. Researchers have not yet proven that allergy shots reliably relieve food allergies.

Research

The National Institute of Allergy and Infectious Diseases conducts research on food allergy and other allergic diseases. This research is focused on understanding what happens to the body during the allergic process—the sequence of events leading to the allergic response and the factors responsible for allergic diseases. This understanding will lead to better methods of diagnosing, preventing, and treating allergic diseases. Researchers also are looking at better ways to study allergic reactions to foods.

Educating people, including patients, healthcare providers, school teachers, and daycare workers, about the importance of food allergy is also an important research focus. The more people know about the disorder, the better equipped they will be to control food allergies.

Several treatment approaches are currently being tested in research settings.

Immunotherapy with Allergen Injections

One potential treatment for food allergy involves getting injections or shots (immunotherapy) subcutaneously (under the skin) that contain small quantities of the food extracts to which a person is allergic. These shots are given regularly for a long period of time with the aim of increasing the ability to tolerate the food allergen. Researchers have not yet found a safe and effective way to give allergens subcutaneously, because people often have allergic reactions to these injections.

Immunotherapy with Allergen Under the Tongue

Another potential treatment for food allergy involves putting allergens under the tongue, called sublingual immunotherapy (SLIT). Researchers think this is safer than giving under the skin. As of mid-2007, however, this treatment was only in very early stages.

Anti-IgE Therapy

One published study suggested that some (but not all) people with peanut allergy might be partially protected against allergic reactions to low doses of peanut by taking regular subcutaneous injections of one particular form of a medicine called anti-IgE. Because the FDA-approved anti-IgE medicine has not yet been tested for peanut allergy, this treatment is not currently available for peanut allergy. Scientists need to do further research to determine the value of anti-IgE.

More Information

National Institute of Allergy and Infectious Diseases
6610 Rockledge Drive, MSC 6612
Bethesda, MD 20892-6612
301–496–5717
www.niaid.nih.gov

National Library of Medicine
MedlinePlus
8600 Rockville Pike
Bethesda, MD 20894
1–888–FIND–NLM (1–888–346–3656) or 301–594–5983
www.medlineplus.gov

American Academy of Allergy, Asthma & Immunology
555 East Wells Street, Suite 1100
Milwaukee, WI 53202-3823
1–800–822–ASMA (1–800–822–2762)
www.aaaai.org

The American Academy of Pediatrics
141 Northwest Point Boulevard
Elk Grove Village, IL 60007-1098
847–434–4000
www.aap.org

American College of Allergy, Asthma & Immunology
85 West Algonquin Road, Suite 550
Arlington Heights, IL 60005
1–800–842–7777
www.acaai.org

Asthma and Allergy Foundation of America
1233 20th Street, NW, Suite 402
Washington, DC 20036
1–800–7–ASTHMA (1–800–727–8462) or 202–466–7643
www.aafa.org

The Food Allergy and Anaphylaxis Network
11781 Lee Jackson Highway, Suite 160
Fairfax, VA 22033
1–800–929–4040
www.foodallergy.org

Allergy Extracts

Food and Drug Administration
Center for Biologics Evaluation and Research
1401 Rockville Pike
Rockville, MD 20852-1448
1–800–835–4709 or 301–827–1800
www.fda.gov/cber

Celiac Disease and Lactose Intolerance

National Institute of Diabetes and Digestive and Kidney Diseases
National Digestive Diseases Information Clearinghouse
2 Information Way
Bethesda, MD 20892-3570
1–800–891–5389
www.digestive.niddk.nih.gov

Eczema

National Arthritis and Musculoskeletal and Skin Diseases Information Clearinghouse
1 AMS Circle
Bethesda, MD 20892-3675
1–877–22–NIAMS (1–877–226–4267) or 301–495–4484
www.niams.nih.gov

American Academy of Dermatology
P.O. Box 4014
Schaumburg, IL 60168-4014
847–330–0230
www.aad.org

National Eczema Association for Science and Education
4460 Redwood Highway, Suite 16-D
San Rafael, CA 94903-1953
1–800–818–7546 or 415–499–3474
www.nationaleczema.org

Food Contents

U.S. Department of Agriculture
Food and Nutrition Information Center
National Agricultural Library, Room 105
10301 Baltimore Avenue
Beltsville, MD 20705-2351
301–504–5719
www.nal.usda.gov/fnic

Food Facts

American Dietetic Association

National Center for Nutrition and Dietetics Information Line
1–800–366–1655
www.eatright.org/Public

Glossary

allergens—substances that cause an allergic reaction.

amino acids—any of the 26 building blocks of proteins.

anaphylaxis—a severe reaction to an allergen that can cause itching, fainting, and in some cases, death.

antibody—a molecule tailor-made by the immune system to lock onto and destroy specific foreign substances such as allergens.

assay—a laboratory method of measuring a substance such as immunoglobulin.

bacteria—kind of microbe, some of which can contaminate or spoil food.

basophils—white blood cells that contribute to inflammatory reactions.

challenge—process of assessing the immune system's response to a food allergen.

cells—the smallest units of life; the basic living things that make up tissues.

celiac disease—a disease of the digestive system that damages the small intestine and interferes with absorption of nutritional contents of food.

cytotoxicity testing—an unproven laboratory method of diagnosing allergies by examining blood samples under a microscope to see if white blood cells "die."

elimination diet—certain foods are removed from a person's diet and a substitute food of the same type, such as another source of protein in place of eggs, is introduced.

enzyme—a protein produced by living cells that promotes specific biochemical reactions at body temperatures.

epinephrine—a drug form of adrenaline (a natural hormone in the body) that stimulates nerves.

extract—a concentrated liquid preparation containing minute parts of specific foods.

gastrointestinal (GI) tract—an area of the body that includes the stomach and intestines.

glucocorticoid—a type of steroid drug that reduces inflammation.

granule—grain-like part of a cell.

histamine—chemical released by mast cells and basophils.

histamine toxicity—an allergic-like reaction to eating foods containing high levels of histamine.

immune system—a complex network of specialized cells, tissues, and organs, such as the lungs, that defends the body against attacks by disease-causing microbes.

immunoglobulin—one of a large family of proteins, also known as antibody.

inflammation—an immune system reaction to allergens or germs. Signs include redness, swelling, pain, or heat.

lactose intolerance—the inability to digest lactose, a kind of sugar found in milk and other food products. Lactose intolerance is caused by a shortage of the enzyme lactase, which is produced by the cells that line the small intestine.

microbes—tiny life forms, such as bacteria, viruses, and fungi, that may cause disease.

mast cells—large granule-containing cells found in body tissues that are typical sites of allergic reactions.

molecule—building block of a cell; examples are proteins, fats, and carbohydrates.

provocative challenge—an unproven test in which diluted food allergen is placed under the tongue or injected under the skin to find out whether symptoms get worse.

tissues—groups of similar cells joined to perform the same function.

toxins—agents produced by plants and bacteria that are poisonous and that also may trigger allergic reactions.

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