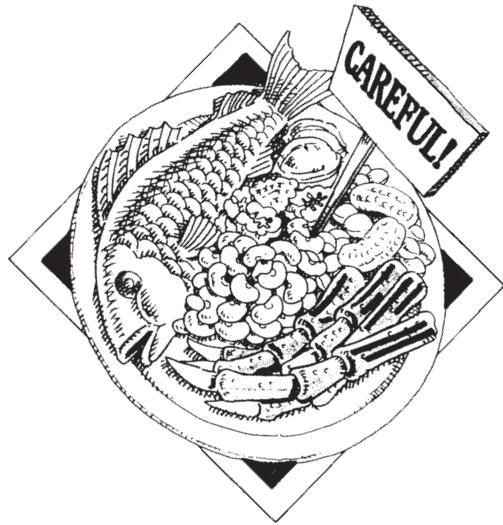




# ADVERSE REACTIONS TO FOODS A PATIENT'S GUIDE TO:

- ◆ Problem Foods & Food Additives
  - ◆ Diagnosis
  - ◆ Treatment
  - ◆ Resources



## BACKGROUND & INTRODUCTION

Hippocrates, an early Greek physician and philosopher, was one of the first to note that cow's milk could cause health problems for some people. Although we don't know if he was referring to a true allergy to cow's milk protein or to an inability to digest a milk sugar called lactose, we do know that food allergy reports began to appear in modern Europe in the early 1900's. Since the 1940's, food allergy has been clearly recognized by doctors around the world.

The true number of people who have food allergy is unknown (estimates of the incidence of cow's milk allergy are reported to range from 0.3% to 7.5%. The incidence is higher in infants than in adults.) Many adverse reactions to foods, such as those to cow's milk, are seldom a result of true allergic reactions. In some cases, such symptoms have been presumed to be allergic reactions only because no other cause could be found and/or because the patient's symptoms improved when the food, for example, cow's milk, was removed from the diet.

This booklet summarizes what is currently known about food allergy. It is hoped that the information provided



will help answer some of the questions about food allergy and other adverse reactions to foods to clear up some of the persistent misconceptions and myths that surround this topic.

## DEFINITION OF TERMS

Since no uniform definitions exist for the various terms, the Committee on Adverse Reactions to Foods of the American Academy of Allergy and Immunology suggests the following:

**Adverse Reaction or sensitivity to a food:** A general term that is used to describe any abnormal reaction to a food or food additive that is eaten, whether caused by allergic or non-allergic mechanisms.

**Food allergy or hypersensitivity to a food:** An abnormal immunologic reaction in which the body's immune system overreacts to harmless things and irritating, uncomfortable symptoms result after eating a food or food additive. The word "allergy" is frequently

over used and misused. The reaction actually only occurs in some people, usually as the result of a genetic factor, an may be noticeable after just a small amount of the food or food additive is eaten. (Wheezing after consuming milk or dairy products is an example.)

**Food intolerance:** An abnormal physical response to a food or food additive that is eaten and is not proved to be immunologic, i.e., milk sugar (lactose) intolerance where the individual lacks the enzymes to break down the milk sugar for proper digestion.

**Food anaphylaxis:** A severe allergic reaction that can sometimes be fatal.

**Food poisoning:** An adverse reaction caused by a food or food additive without immune system mechanisms being involved. Toxins (poisons or bacteria) may be either contained within the food or released by microorganisms or parasites contaminating food products.

**Pharmacologic food reaction:** An adverse reaction in which a chemical found in a food or food additive produces a drug-like (pharmacologic) effect, i.e., caffeine in coffee causing "the jitters."



## **F**OODS THAT CAUSE PROBLEMS

Food allergens, those parts of foods that cause allergic reactions, are usually proteins. Most of these allergens can still cause reactions even after they are cooked or have undergone digestion in the intestines. Numerous food proteins have been studied to establish allergen content. The most thoroughly studied allergens include cow's milk, egg, peanut, wheat, and soy are the most common food allergens.

All foods come from either a plant or an animal source. Foods are grouped into families according to their origin. For example, black-eyed peas, kidney beans, lima beans, peas, soybeans, and peanuts are some of the members of the pea (legume) family, whereas asparagus, chives, garlic, onion, and shallot are members of the lily family. In some food groups, especially legumes and seafood's, an allergy to one member of a family may result in the person being allergic to other members of the same group (known as cross-reactivity). Persons allergic to peanuts are more likely to be allergic to soybeans, peas, and other legumes than to walnuts or pecans. However, some persons may be allergic to both peanuts and walnuts. These allergies are called coincidental allergies.



Soybeans are being used more frequently as protein extenders and food supplements. Thus, the potential for developing an allergy to soybeans is also increasing.

Within animal groups of foods, cross-reactivity within food families is not seen as often. For example, people allergic to cow's milk can usually eat beef, and patients allergic to eggs can usually eat chicken.

Cooking some proteins usually reduces their ability to cause a reaction, but the heating processes may actually make some proteins more allergenic. The protein of cow's milk is composed of two types: casein (80%) and whey (20%). Most of these proteins are not affected by heating. Persons allergic to eggs usually react only to the egg white, which contains several proteins, and again, cooking or heating does not make these proteins non-allergenic. Natural processes such as ripening also may affect the allergenic properties of a food. For example, tomatoes become more allergenic as they ripen.

## **F**OOD INTOLERANCE REACTIONS

Food intolerance reactions are usually caused by factors in the diet other than proteins (food allergens). One of the more common food intolerance reactions, for instance, may be the result of the body's inability to properly digest sugars in the food (e.g., milk sugar intolerance). Other food intolerance reactions may be the result of

natural drug-like chemicals in the foods (e.g., reactions to caffeine (jitteriness) in coffee or soft drinks or reactions (headaches) to amines in cheese and chocolate. Examples of the amine-type drugs include tyramine found in cheese and phenylethylamine found in chocolate). Still other non-allergic adverse reactions may be due to chemicals added to food stuffs in order to preserve the food or increase its appeal. These chemicals are called food additives and their effect will be discussed later on in this booklet.



## **S**EVERE ALLERGIC REACTIONS CAUSED BY FOOD

Anaphylaxis is a generalized allergic reaction that is often severe and sometimes fatal. This reaction may involve any body system; however, the skin, nose, throat, lungs, stomach, intestinal tract, heart and blood vessels are primarily affected. The first signs of anaphylaxis may be a red, itchy rash, and a feeling of warmth. These may be followed or accompanied by light-headedness, shortness of breath, or sneezing; a feeling of anxiety; stomach or uterine cramps; and/or vomiting and diarrhea. In most cases of anaphylaxis, the symptoms go away or are reversed by treatment. In other rare cases,

the symptoms are prolonged and may lead to death.

Foods frequently listed as causes of anaphylaxis include peanuts, nuts, shellfish, eggs, and seeds. Anaphylactic reactions have also been reported in persons who have eaten milk, chocolate, barley, rice, wheat, citrus fruits, melons, bananas, tomatoes, spinach, corn, potatoes and soybeans. However, any given food protein can be troublesome, depending on the individual.

Anaphylactoid reactions mimic food allergy symptoms but are not caused by true allergic mechanisms. These common reactions may occur with foods such as strawberries, eggs, wine plus other alcohol containing beverages and, on occasion, by spoiled fish.

## **S**KIN & RESPIRATORY REACTIONS CAUSED BY FOODS

The most common allergic skin reaction to food is hives. Hives are red, very itchy, swollen areas of the skin. Hives arise suddenly, and leave quickly. They often appear in clusters, with new clusters appearing as other areas clear. Hives may occur alone or with any of the symptoms listed under anaphylaxis.

Atopic dermatitis is an occasionally transient - but more likely chronic - itchy inflammation of the skin often occurring in individuals with personal or family histories of allergic rhinitis or asthma.

The role of specific food allergens' effect on atopic dermatitis has been a matter of debate. Many physicians have supported the view that exposure to food allergens (especially milk) and even food exposures encountered during pregnancy and through breast feeding worsened atopic dermatitis. Others, critical of the design of these studies, have remained unconvinced of the relationship. Recent double-blind studies, however, indicated a definite relationship between food hypersensitivity and a worsening of the rash in some children with atopic dermatitis.



Nasal allergy may occasionally be the respiratory tract's reaction to food allergens, although more commonly, such reactions are caused by intolerance. Symptoms of nasal allergy, sometimes loosely referred to as "hay fever," include itching of the nose or roof of the mouth, sneezing, and difficulty breathing through the nose. Symptoms of eye allergy, if present, include itchy, red, and tearing eyes.

Asthma, the condition in which the airways of the lung narrow, may be related to food allergy. Most cases of asthma caused by a food occur in infants and are frequently connected to cow's milk sensitivity. Foods, however, are not thought to play a frequent role in triggering asthma in adults.

## **G**ASTROINTESTINAL REACTIONS CAUSED BY FOODS

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The most common symptoms one might be likely to experience are vomiting, diarrhea, and abdominal cramping. Other less common symptoms may include a red rash around the mouth, itching and swelling of the mouth and throat, nausea, abdominal pain, swelling of the stomach and gas. Although diarrhea and vomiting are the two most common symptoms of food allergy reactions, they may also be a symptom of food intolerance and some other problems such as parasites and infections. In fact, lactose intolerance is a major cause of adult diarrhea.

In infants, reaction to certain foods, especially fruits, cow's milk, egg white, peanuts, and wheat are common.

Some of these reactions, such as a rash around the mouth (due to the natural acids in foods like tomatoes and oranges), or diarrhea (due to excess sugar in fruit juice or commercial beverages), are non-allergic in nature and are usually temporary problems. Other reactions, though, are truly allergic and may be caused by other traces of the offending food when eaten again.

As the child becomes older, however, even those foods causing allergic reactions may be tolerated - perhaps because of the maturing immune system. Therefore, periodic food allergy check-ups should be carried out under the supervision of a doctor.



In individuals with chronic diarrhea, all types of adverse reactions to foods should be considered. An example includes celiac disease which is a non-allergic reaction to gluten, the protein found in wheat. This condition can result in severe damage to the small bowel. Symptoms include bulky, loose, foul-smelling stools, weight loss, anemia, and muscle weakness. The disease first occurs in early childhood, and may be seen when cereals or other sources of gluten are introduced into an infant's diet. Treatment of this disease is basically a gluten-free diet for a lifetime. Persons with celiac disease must avoid all foods that contain wheat, rye, and barley. Oats are tolerated by most people with this disease.

## **A**DVERSE REACTIONS TO FOOD ADDITIVES

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Food intolerance due to chemicals added to foods is of increasing concern today. They symptoms of some of these reactions are allergic-like in nature. The food and drug color dye tartrazine (yellow-FD & C No. 5) has been shown to cause asthma in some aspirin-sensitive asthmatics. Mixed colors, particularly red and yellow dyes of this type, may produce a drug-like effect and worsen the problem in a small number of children who are hyperactive.

The "Chinese restaurant syndrome" (anxiety, flush in the face, pressure in the chest) has been shown to be caused by eating large amounts of the flavor enhancer - monosodium glutamate. Some preservatives (BHT/BHA) and coloring agents (e.g., yellow) have been linked to a few cases of chronic hives in adults.

The sulfite preservatives are now known to have the potential to cause a serious attack of asthma in some sulfite-sensitive asthmatics. Hives, shock and even death can also result. Adult asthmatics should require regular medication are of greatest risk.

Sulfites are used in some restaurants as "stay fresh" agents, particularly as chemicals sprayed on salads to prevent wilting and browning edges. Sulfites can also be found in some processed foods and beverages, including fresh shrimp, mushroom, potato chips, dried fruits and wine. Though figures vary, studies have indicated at least 5% of all asthmatics are likely to be at risk and sensitive to these preservatives.



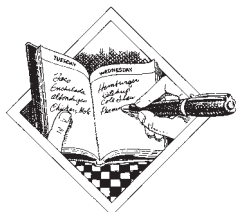
## OTHER PROBLEMS SUSPECTED TO BE RELATED TO DIET

Many common complaints have been attributed to food allergy. These include migraine headache, infant colic, recurrent abdominal pain, the tension-fatigue syndrome, hyperactivity in children, muscles aches and pains, and short attention span. However, little evidence exists today to link any of these problems conclusively with food allergy.

## DIAGNOSING FOOD ALLERGY

An allergist has a special approach to the diagnosis of food allergy. First, a detailed medical history will be taken, followed by a physical examination. The allergist will then inquire about the frequency, seasonality, severity, and nature of the symptoms. The allergist will also ask how much time elapses between the eating of a food and any possible reaction.

The allergist may next suggest keeping a food diary to aid in the discovery of food allergy. A food diary is a detailed record of the foods eaten, listing date, time and any symptoms that occurred afterward.



When an allergy to a single food is suspected, the allergist may recommend eliminating the food for a time. This is still a standard technique for the diagnosis of food allergies. If the symptoms are relieved, the allergist may add the food to the diet once again to see what happens. When a food allergy is suspected on the basis of frequent or continuous symptoms, no single food may be identified as the likely offender, and then a diet in which several suspected foods are eliminated may be recommended, or a non-allergic food substitute might be suggested for a period of time.

Direct allergy skin tests may be helpful in determining which foods are involved in the allergic process. Skin testing may also be useful in ruling out food allergy rather than food intolerances. But such procedures often yield disappointing, negative reactions.

In skin testing, a small amount of liquid extract, made from the food, is placed on the back or arm. A needle is then passed through the liquid on the top layer of skin (prick test). Or, small scratches are made through the liquid and the top layer of skin (scratch test). The development of any wheal (bump) within 20 minutes indicates a positive response. Skin tests are not helpful when sensitivity to simple foods, i.e., sugars, or food additives (chemicals) is suspected. Unfortunately, skin testing with food is not as useful as it is for diagnosing pollen allergies.

Blood tests (known as the RAST test) may be helpful for selected patients but are generally not as sensitive as elimination and

“challenge” of a suspected food. In some cases, a food RAST blood test may be recommended by your doctor to obtain similar information as with the allergen skin test. Food cytotoxic blood test and sublingual provocation food testing are not recommended, however, since these tests are unproven as procedures to diagnose food allergies. In a March 19th, 1985 Compliance Policy Guide, the Food and Drug Administration determined that “the cytotoxic test remains, in 1985, as an unproven diagnostic procedure by scientific literature of well-controlled studies and clinical trials.”

In a further development, the Health Care Financing Administration (HCFA) published a notice in the June 13th, 1985 Federal Register excluding cytotoxic testing for food allergies from Medicare coverage because “available evidence does not show that these test are safe and effective.”

If diagnosis of food sensitivity remains in doubt after the use of diet diaries, elimination diets, and allergy tests, the allergist may recommend “blinded” food and/or food-additive “challenges” in his office and at times in the hospital under close observation. Usually, the suspected food or a neutral food, called a placebo, is fed in opaque colorless capsules or as a hypoallergenic slush or pudding (such as tapioca) so neither the patient nor the doctor knows whether the suspected food or the placebo is being eaten. This is called a “double-blind” challenge. When properly performed, these challenges are very helpful in establishing a cause and effect relationship between a food and an allergy symptom.



## TREATMENT OF FOOD ALLERGY

Avoidance of specific foods is the best treatment method for food allergy.

Allergy injections for food are not recommended and may be dangerous. Treating food allergies with drugs may be helpful only when symptoms persist or when offending foods are likely to be eaten away from home and cannot be avoided.

Anaphylactic reactions caused by food allergies are among the few potentially life-threatening allergic conditions. Persons who have experienced an anaphylactic reaction to a food must strictly avoid it.

Because the sensitive individual may eat the food in an unrecognized form, (in a restaurant, for instance) he or she should carry a kit containing epinephrine (adrenaline) at all time and should be taught how to inject himself or herself with the medication in order to be prepared for an emergency. The sensitive individual should also wear an identification bracelet which describes the allergy. Some restaurants, airlines, and major hotels may help the food-allergic person avoid obviously troublesome foods. However, restaurant meals or foods that have been processed may contain small

**P**REVENTING FOOD  
SENSITIZATION  
& ALLERGY

amounts of foods that need to be avoided. Therefore, a person who is highly allergic must be cautious about all restaurant foods, particularly combination foods such as soups, quiche, hash, etc.

A person who is highly allergic to a food **must** also read food labels carefully. Foods that have been processed may contain amounts of the food that need to be avoided. For example, milk may not be one of the ingredients listed on a label. Instead, the label may list casein, sodium caseinate, or milk solids. Not every food that contains wheat identifies it as such; sometimes wheat is listed as gluten. Similarly, egg white is frequently listed as albumin. Also, cottonseed flour may be used in place of wheat flour in pastry cooking.

Today, government agencies are proposing stricter regulations for food ingredient labeling so that consumers will be more aware of the existence of all food additives and preservatives.

Several books are available to help a food-allergic person avoid the offending food.

2. Gourmet Food on a Wheat-Free Diet, by M.N. Wood Published in 1967 by Bannerstone House, Springfield, Illinois.
3. Allergy Recipes, by the American Dietetic Association. Published in 1969 in Chicago, Illinois.

### Other Resources

American Academy of Allergy & Immunology  
611 East Wells Street  
Milwaukee, WI 53202  
(414) 272-6071

American College of Allergists  
800E. NW Highway  
Suite 101  
Mount Prospect, IL 60056  
(312) 255-0380

Asthma and Allergy Foundation of America  
1835 K St. NW  
Suite P-900  
Washington, DC 20006  
(202) 293-2950

National Institute of Allergy and Infectious Diseases  
Office of Research Reporting and Public Response  
9000 Rockville Pike  
Bethesda, MD 20205  
(301) 496-5717

No study has proven that avoidance of cow's milk in infancy prevents food allergy; however, some evidence suggests that using breast milk in early infancy may result in a delayed or lower rate of occurrence of other forms of allergy. The nursing mother should also avoid the foods to which her infant may become allergic. Although cow's milk is the chief cause of food allergy in infants, other foods, including eggs, chicken, beef, wheat and other cereals, fish, and citrus fruits, may cause allergy also. Some doctors recommend that solid food not be fed to a baby during the first six months of life, especially if allergy is prominent in the child's family. There is a great deal of research going on in the field of food allergy including better methods to diagnose this problem. Medications are also being tested that may make it safer for food-allergic individuals to eat out.



Three of these books are listed below:

1. The Milk-Free and Milk-Free, Egg-Free Cookbook, by I. S. Sainsburg. Published in 1974 by Bannerstone House, Springfield, Illinois.

This pamphlet was prepared under the direction of the Academy of Allergy and Immunology Public Education Committee, in cooperation with the Asthma and Allergy Foundation of America and the American College of Allergists. The material in the pamphlet was based upon information in the monograph, *Adverse Reaction to Food*, American Academy of Allergy and Immunology Committee on Adverse Reactions to Foods and the National Institute of Allergy and Infectious Diseases, Anderson, J.A. and Sogn, D.D., editors. U.S. Department of Health and Human Services, NIH Publication #84-224, July, 1984.