Sulfites: Safe for Most, Dangerous for Some
by Ruth Papazian

It wasn't a special occasion--or even a fancy restaurant--but Karen, 37, will never forget that meal:

> *"My boyfriend and I were at a hamburger joint, and I had a burger and fries. About 10 minutes after we finished eating, my throat began to itch. I grabbed my [asthma] inhaler but I could feel my throat constricting. I couldn't breathe and started to panic. When I passed out, my boyfriend flagged down a passing police car. The officer radioed for an ambulance, and I was rushed to the hospital. I was revived with a massive dose of epinephrine to counteract the reaction caused by the sulfite solution the potatoes had been soaked in before frying.*
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> *"I know enough to stay away from wine, shrimp and other foods that contain sulfites, and take note whenever I don't feel right after eating something. But I never expected french fries to be sulfited. I've had allergic reactions to sulfites before, but this time I came close to dying.*
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> *"I was angry that this happened to me. I felt powerless--I was careful and knowledgeable, and yet I couldn't protect myself. Who ever heard of a lethal french fry? Afterward, I refused to eat out in restaurants for almost two years, and I still can't visit people or go on vacation without knowing there is a hospital nearby."*

The Food and Drug Administration estimates that one out of a hundred people is sulfite-sensitive, and that 5 percent of those who have asthma, like Karen (who asked that her last name not be used), are also at risk of suffering an adverse reaction to the substance. "By law, adverse reactions to drugs must be reported to FDA by doctors or pharmaceutical companies. But with sulfites and other food ingredients, reporting is voluntary so it's difficult to say just how many people may be at risk," cautions FDA consumer safety officer JoAnn Ziyad, Ph.D.

Complicating matters, scientists have not pinpointed the smallest concentration of sulfites needed to provoke a reaction in a sensitive or allergic person. FDA requires food manufacturers and processors to disclose the presence of sulfiting agents in concentrations of at least 10 parts per million, but the threshold may be even lower. The assay used to detect the level of sulfites in food is not sensitive enough to detect amounts less than 10 ppm in all foods (that's 1 part sulfite to 100,000 parts of food--the equivalent of a drop of water in a bathtub) so that's what the regulation has to be based on, explains Ziyad.

"The most rapid reactions occur when sulfites are sprayed onto foods or are present in a beverage, but the most severe reactions occur when sulfites are constituents of the food itself," says Ron Simon, M.D., head of Allergy, Asthma and Immunology at Scripps Clinic and Research Foundation in La Jolla, Calif.

A person can develop sulfite sensitivity at any point in life, and no one knows what triggers onset or the mechanism by which reactions occur. "Doctors believe that asthmatics develop difficulty breathing by inhaling sulfite fumes from treated foods," notes Dan Atkins, M.D., a pediatrician at the National Jewish Center for Immunology and Respiratory Medicine in Denver, Colo. He says that in a severe reaction an overwhelming degree of bronchial constriction occurs, causing breathing to stop. This can lead to lack of oxygen reaching the brain, heart, and other organs and tissues and, possibly, a fatal heart rhythm irregularity.

"We now know that asthmatics who have more severe symptoms and are dependent on corticosteroids, such as prednisone or methylprednisolone, are especially prone to sulfite sensitivity and are most at risk of having a severe reaction," notes Atkins. But it's a chicken-and-egg situation, notes Simon: "We don't know which comes first, the asthma or the sulfite sensitivity, because some people's first experience with asthma is a sulfite reaction, and as their asthma becomes more severe they eventually become steroid-dependent."

Sulfite sensitivity can be tricky to diagnose. Karen went to an internist and two pulmonary specialists without getting to the bottom of her problem.

"People who do experience adverse reactions to sulfites know that it's something they ate, but might not know what that something is," says Atkins. "I'll ask a patient complaining of an adverse reaction what he or she ate and drank when it occurred. If beer or wine doesn't seem to be the problem, I tend to dismiss sulfite sensitivity. But if I think sulfites may be the culprit, I'll do a challenge [a type of allergy test in which a small amount of the suspect substance is administered in a capsule or in a drink and the patient is monitored to see whether there is a reaction]."

If a person develops hives after ingesting sulfites, the doctor will do a prick test (a small concentration of sulfite is placed on the skin, which is then pricked; the test is positive if a welt develops on the spot). "People who have positive skin tests to sulfites are likely to be allergic to the additive, rather than have a sensitivity. These people, who are usually not asthmatic, are most at risk of anaphylactic shock, [a life-threatening reaction]," says Simon.
Regulatory Status in Flux

Sulfur-based preservatives, or sulfites, have been used around the world for centuries to:

- inhibit oxidation ("browning") of light-colored fruits and vegetables, such as dried apples and dehydrated potatoes
- prevent melanosis ("black spot") on shrimp and lobster
- discourage bacterial growth as wine ferments
- "condition" dough
- bleach food starches
- maintain the stability and potency of some medications.

When the Federal Food, Drug, and Cosmetic Act was amended in 1958 to regulate preservatives and other food additives, FDA considered sulfites to be generally recognized as safe (GRAS). But when FDA reevaluated their safety and proposed to affirm the GRAS status of sulfiting agents in 1982, the agency received numerous reports from consumers and the medical community regarding adverse health reactions. In response, FDA contracted with the Federation of American Societies for Experimental Biology (FASEB) to examine the link between sulfites and reported health problems that ranged from chest tightness or difficulty breathing to hives to fatal anaphylactic shock. In 1985, FASEB concluded that sulfites are safe for most people, but pose a hazard of unpredictable severity to asthmatics and others who are sensitive to these preservatives. Based on this report, FDA took the following regulatory actions in 1986:

Prohibited the use of sulfites to maintain color and crispness on fruits and vegetables meant to be eaten raw (for instance, restaurant salad bars or fresh produce in the supermarket).

Required companies to list on product labels sulfiting agents that occur at concentrations of 10 ppm or higher, and any sulfiting agents that had a technical or functional effect in the food (for instance, as a preservative) regardless of the amount present. (This labeling requirement was extended to standardized foods, such as pickles and bottled lemon juice, in 1993.) FDA requires that the presence of sulfites be disclosed on labels of packaged food (although manufacturers need not specify the particular agent used). This information will be included in the ingredient portion of the label, along with the function of the sulfiting agent in the food (for instance, a preservative).

When food is sold unpackaged in bulk form (as with a barrel of dried fruit or loose, raw shrimp at the fresh fish counter), store managers must post a sign or some other type of labeling that lists the food's ingredients on the container or at the counter so that consumers can determine whether the product was treated with a sulfiting agent.

In 1987, FDA proposed to revoke the GRAS status of sulfiting agents on "fresh" (not canned, dehydrated or frozen) potatoes intended to be cooked and served unpackaged and unlabeled to consumers (french fries, for example), and issued a final ruling to this effect in 1990. However, the rule was held null and void in 1990 after a protracted court battle in which the "fresh" potato industry prevailed on procedural grounds.

This legal setback notwithstanding, "the agency continues to have concerns about the safety of sulfiting agents, and plans further action to protect the consumer," notes Ziyad. Steps the agency is considering include establishing maximum residual levels for specific foods and additional labeling rules.

"The ultimate goal of sulfite regulation is to make sure that there is no higher level of sulfite residues in food than is absolutely necessary and to encourage the use of substitutes for sulfites in food processing," says Ziyad.

Sniffing Out Sulfites

Since 1985, FDA's Adverse Reaction Monitoring System has been tracking reactions to sulfites. Over a 10-year period, 1,097 such cases have been reported. However, thanks to regulatory action taken by FDA over the years, coupled with increased consumer savvy, the number of reported sulfite-related health incidents has been dropping steadily. In 1995, just six cases were reported.

Ten years ago, FDA banned the use of sulfites on fruits and vegetables that are to be eaten raw (as with a salad bar)--and the vast majority of those in the food service industry honor the prohibition--but consumers who are sulfite-sensitive "shouldn't take anything for granted," says Ziyad.

Current FDA regulations do not require managers of food service establishments to disclose whether sulfites were used in food preparation. "Consumers continually request FDA to extend the regulation to include food service establishments because either waiters and other staff members didn't know whether the food was treated with sulfites, or gave erroneous information," notes Ziyad. "FDA's position on the issue has been that consumers who see sulfites listed on the label of a packaged food should be able to deduce that the same food sold in a food service establishment would also contain sulfites," she explains.

In addition, sulfites are still found in a variety of cooked and processed foods (including baked goods, condiments, dried and glacéed fruit, jam, gravy, dehydrated or pre-cut or peeled "fresh" potatoes, molasses, shrimp, and soup mixes) and beverages (such as beer, wine, hard cider, fruit and vegetable juices, and tea).

Since sulfites are added to so many foods, someone who is sensitive to the additive must not assume that a food is safe to eat, says Atkins. He recommends these measures to avoid sulfites when buying unlabeled foods at the deli or supermarket and ordering at a restaurant:

If the food is packaged, read the label. If it is being sold loose or by the portion, ask the store manager or waiter to check the ingredient list on the product's original bulk-size packaging. Avoid processed foods that contain sulfites, such as dried fruits, canned vegetables, maraschino cherries, and guacamole. If you want to eat a potato, order a baked potato rather than hash browns, fries, or any dish that involves peeling the potato first. If you have asthma, have your inhaler with you when you go out to eat. Similarly, if you've experienced a severe reaction to sulfites in the past (such as breaking out in hives), carry an antihistamine and make sure you have handy a self-administering injectable epinephrine, such as EpiPen, so that if you have a reaction you can stabilize your condition until you get to an emergency room.

"It takes some doing, but you can take steps to minimize your contact with sulfites if you are diagnosed with asthma or sulfite sensitivity," says Ziyad. "But you may not even know you have a problem with sulfites until a reaction occurs. Undiagnosed people are at risk because even if they know that sulfites can cause adverse reactions, they often don't associate sulfites with their own health problems," says Ziyad.

"Regulations can go a long way towards protecting people, but there's no substitute for knowledge."

Ruth Papazian is a writer in Bronx, N.Y. This article originally appeared in the December 1996 (Vol 30 No 10) issue of FDA Consumer Magazine.