Food additives—what you need to know

Many people think that food would be much more healthful if manufacturers wouldn't use additives, particularly "chemicals" or "artificial ingredients." But, in large part, they are wrong. Many of these substances—notably preservatives, vitamins, and minerals—help keep our food supply safe and offer obvious health benefits. Others, such as emulsifiers and flavoring agents, improve the taste, texture, consistency, or appearance of foods. True, in an ideal world, we wouldn't need preservatives: all foods would be grown nearby, and all meals prepared from scratch. In our world, though, preservatives keep our foods from spoiling (thus keeping grocery prices down) and protect us from food poisoning.

The main problem with additives is that the foods with the longest list of additives tend to be "junk food"—heavily processed, high in fat and sodium, and not very nutritious.

Natural vs. synthetic

Food additives have been with us for thousands of years, probably since the discovery that salted meat lasts longer. The ancient Egyptians used flavoring and coloring agents, as did the Romans. And additives are unlikely to go away, since Americans depend on an ever-wider variety of convenience foods that require them. This worries many people. However, our food supply is more closely scrutinized, and additives more strictly regulated (primarily by the Food and Drug Administration), than ever before. In the "good old days" a century ago, eating was really risky, since foods weren't well preserved or carefully handled. Adulteration of foods was common—for instance, toxic metals were used in food coloring, and copper sulfate was added to bread.

The most commonly used additives are sugar, salt, and corn syrup, which together with baking soda, pepper, and a dozen other substances make up about 98% (by weight) of all additives. Notice that the first five are all "natural." Yet natural substances can be health hazards—just look at sassafras bark extract (known as safrole and formerly used to flavor root beer) or aflatoxin (found in peanuts), both known carcinogens and both natural. Many additives are, in a sense, both natural *and* man-made—that is, natural substances that have been modified, such as cellulose and modified starches.

On the other hand, there's no reason to worry about the great majority of artificial ingredients. Laboratory-made vitamins and some flavors, for instance, are exact replicas of natural substances, so the body can't tell them apart. Other chemicals have no natural counterparts, and while this isn't necessarily bad, they arouse the most fear in consumers, who may remember the banning of the artificial sweetener cyclamate and some artificial colorings in the 1970s because they were shown to cause cancer in animals. Even under the best circumstances, absolute safety of a substance can never be proven, and any substance may be harmful when consumed in excess.

Neutraceuticals or pseudo-foods?

What about all those herbs—from ginseng and ginkgo to echinacea and St. John's wort—and other "health-enhancing" substances being added to more and more foods and beverages? This has become a booming business. Such ingredients have never been approved as food additives, and they are not GRAS ("generally recognized as safe"). After much prodding by nutritionists and consumer groups, the FDA last year warned companies for the first time that these "novel ingredients" are probably illegal and may be unsafe in foods. For instance, St. John's wort can interfere with many prescription drugs, and ginkgo may exacerbate bleeding in people taking anticoagulants or aspirin. And many people should not take echinacea, including those who are allergic to daisies, plus those with chronic diseases involving immune dysfunction, such as HIV, lupus, rheumatoid arthritis, and multiple sclerosis.

Since 1958 Congress has required manufacturers to prove the safety of any new additives (such as the fat substitute Olestra, which finally won approval in 1995); before that, the burden was on the government to prove the health danger of a substance. Once an additive is shown to be safe in manufacturer-sponsored tests, the FDA sets guidelines for its use. The 1958 law exempted about 700 "generally recognized as safe" (GRAS) substances from

What is all that stuff?

Additives do many jobs. Most of the estimated 3,000 compounds deliberately added to foods fall into these categories.

TYPE (AND EXAMPLES)	FUNCTIONS	COMMON USES	COMMENT
MAINTAIN/IMPROVE QUALITY			
Preservatives Nitrates, nitrites, BHT, BHA, benzoic acid, sulfites, ascorbic acid (vitamin C), calcium propionate	1) Retard spoilage from bacteria, molds, and fungi, 2) keep fats/oils from turning rancid, or 3) delay browning, as in cut fruit.	Most processed or prepared foods	Nitrates and nitrites promote cancer in lab animals, but there's no evidence that the amounts in our foods pose any risk. Sulfites may cause allergic reactions, especially in people with asthma. BHA and BHT appear to be safe, and may even protect against cancer.
Nutrients Vitamins and minerals	Replace nutrients lost in processing, or add those lacking in the diet.	Processed flour, rice, cereals, salt, milk, margarine	Most vitamins are artificially synthesized, but are chemically identical to the natural substances.
MAKE MORE APPEALING			
Flavor enhancers MSG, hydrolyzed vegetable protein	Modify taste or aroma	Gravies, canned vegetables, soup mixes	Many large studies have failed to find that MSG in food causes allergic reactions (see *Wellness Letter*, April 2001).
Flavors Vanilla, spices, seasonings, artificial flavors	Improve or restore flavor	Baked goods, soft drinks, ice cream	Largest group of additives. Can be listed on labels in general terms such as "spices" or "artificial flavors."
Colors Annatto, carotene, caramel, fruit juice, carmine, synthetic colors	Give foods an appealing, characteristic color	Nearly all kinds of processed foods	Synthetic dyes are most widely used, especially in junk food. Yellow 5 can cause allergic reactions.
Sweeteners Natural sugars (e.g., fructose, corn syrup), artificial sweeteners (aspartame, saccharin)	Give food a more agreeable flavor	Candies, baked goods, soft drinks, many processed foods	Many people worry about the safety of aspartame and other artificial sweeteners because of unfounded Internet rumors. There's no evidence they promote illness. But they may not help with weight loss, either. See *Wellness Letter*, September 2000.
Fat replacers Olestra, oatrim, gums, fibers, modified starch, protein-based compounds	Thicken, provide bulk, creaminess, and rich "mouth feel"	Baked goods, dairy products, cookies, chips, processed meats, dressings	More and better fat substitutes are being used in a wide variety of foods. Some are also used, usually in smaller amounts, as emulsifiers or thickeners (see below).
PROCESSING AIDS			
Emulsifiers (mixers) Lecithin, mono/diglycerides, polysorbate	Keep liquid particles evenly mixed and homogenous	Baked goods, frozen desserts, dressings, gelatin, puddings	Help disperse oils and flavors, as in peanut butter and mayonnaise. Most come from natural sources.
Stabilizers, thickeners, texturizers Gums, carrageenan, gelatin, pectin, cellulose, starch	Improve consistency and provide desired texture	Prepared desserts, sauces, baked goods fruit products, soups	Many are natural carbohydrates that absorb water in foods. Affect "mouth feel" of foods—for instance, by preventing ice crystals from forming in ice cream.
pH control agents Citric acid, acetic acid, alkalis, buffers	Control acidity or alkalinity, thus affecting texture and taste	Soft drinks, baked goods, fruit products	Also used to prevent botulism in low-acid canned goods. Some acids help in the rising of dough.

testing because of their long history of use without any known harmful effect. Many of the most widely used—and controversial—additives are on the GRAS list, including MSG, nitrites, and some other preservatives. The FDA has been re-evaluating all GRAS substances and has banned some and restricted the use of others.

Good news about two preservatives

When you hear "antioxidants" you may think of vitamins C and E and their potential health benefits, while "preservatives" may make you think of forbidding-sounding chemicals and scary health risks. Yet some of

the most common preservatives, notably BHT and BHA, *are* antioxidants. (And, conversely, many antioxidants—such as vitamin C, also known as ascorbic acid—are preservatives.)

For years health-food proponents objected to the use of some, if not all, preservatives. BHA and BHT (short for butylated hydroxyanisole and butylated hydroxytoluene), two of the most commonly used preservatives, were the focus of especially heated debate. They retard rancidity and browning—in other words, they prevent damage by oxygen, or oxidation, which is why they are called antioxidants. They're used in hundreds of foods, especially those rich in fats and oils, such as potato chips, cookies, crackers, and meat products. Several studies in the 1980s found that very high doses (much higher than are found in foods) of BHA and BHT can cause cancer in rats and hamsters. But the great majority of studies have *not* found that BHA and BHT, in the amounts used in foods, promote cancer—or else have found that they actually inhibit it. More recent research, though preliminary, suggests that these preservatives stimulate the body's production of an enzyme that can detoxify carcinogens.

This doesn't mean that you should go out of your way to eat more foods containing BHT and BHA. Most of these, such as crackers and cookies, tend to be high in fat. But you shouldn't avoid foods because you see BHT or BHA in the ingredients list.

Bottom line

Eat fresh or minimally processed foods as much as possible, not because they usually have few additives, but because they are usually most nutritious. When reading the ingredients list on a food label, pay most attention to the main ingredients, which are listed first, not to the additives at the end of the list. You are better off with bread or cookies made from a whole grain and seven additives than bread or cookies made from refined flour, hydrogenated oil, and just three additives. In other words, avoid junk food not because it has additives, but because it is junk.

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