Current Comments

Toward Ending the Confusion Surrounding Food Additives: The Case For Better Labeling

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I am allergic to garlic, a relatively common food additive. In restaurants I always ask if certain foods contain garlic. I find it very annoying indeed to suffer an allergic reaction after the waiter assures me that there is no garlic in the food. It would be extremely helpful to me if all restaurant menus had to provide a complete list of the ingredients in each dish served. Unfortunately it does not seem likely that this will happen. Most diners would probably be turned off by knowing the ingredients used in some restaurants. Maybe they should be. I can well remember the voluminous literature that developed around Kwok's disease,[1,2] otherwise known as the Chinese Restaurant Syndrome. This is a neurological disorder produced by monosodium glutamate, a widely-used food additive.

The labeling of foods found in grocery stores is also less than satisfactory. For example, the children's cereal "Froot Loops" lists additives such as sodium ascorbate, niacinamide, zinc oxide, and BHA on the label. Even well-educated people cannot tell from this list what they are eating. The mere listing of these ingredients on labels doesn't really explain what these exotic-sounding substances are, why they are there, or if they are safe. The arcane nature of chemical nomenclature only adds to the confusion. Therefore, it is not surprising that there is controversy over the necessity and safety of food additives.

Government sources offer little help to the consumer who wants to find out about food additives. Additives are regulated by the Food and Drug Administration (FDA) and are listed in the Code of Federal Regulations (CFR), Title 21.[3] Although the FDA keeps an in-house index of additives, the agency has no published source that consumers can use to find out the status and CFR numbers of specific additives. One detailed publication about additives, *the CRC Handbook of Food Additives* ($64.95) published by the Chemical Rubber Company,[4] lists additives alphabetically with CFR numbers. Unfortunately, our researchers found this source to be dated. According to the publisher the latest volume of this handbook was published in 1973, although a second volume should appear later this year.

General information can be found in such publications as *A Consumer's Dictionary of Food Additives*,[5] by Ruth Winter ($4.95) and from groups such as the Center for Science in the Public Interest (1755 S. Street, NW, Washington, DC 20009). Food industry groups such as the Institute of Food Technologists (221 W. LaSalle St., Chicago, IL 60601), a professional society of technical per-

sonnel in food industries, are also involved in providing public information. Many manufacturers will send literature about specific products on request.

You can also call the FDA and ask for an additive's CFR identification number so you can find it in the regulations. Or, you can leaf through Chapter 1 of Title 21 in the CFR and hope that you'll encounter the additive you want. The additives, however, are listed in the regulations under various classifications, and by various names—common, botanical, and/or chemical. An additive may also be listed by a name different from the one used on a label. And, points out Jelia Witschi, assistant professor of nutrition at Harvard University, "There are hundreds of thousands of food additives."[6] It's small wonder that there is such confusion!

Part of the confusion stems from a general lack of understanding about the term "food additives." According to the Food and Drug Act, food additives are those substances "the intended use of which results or may reasonably be expected to result, directly or indirectly, either in their becoming a component of food or otherwise affecting the characteristics of food. A material used in the production of containers and packages is subject to the definition...."[3] (p. 374). This definition includes natural as well as artificial substances. The definition exempts those substances that the FDA considers "Generally Recognized as Safe" (GRAS), and those which were approved for food industry use before 1958 (Prior Sanctioned). Unofficially, however, most people consider "additive" to mean *any* substance added to a food of which it was not originally a part. In this sense, then, although we rarely think of them as such, sugar, spices, and salt are all additives. Some substances are natural in one food, but additives in another. For example, vitamin A, found in butter, becomes an additive in margarine,[7] where it does not naturally occur. Other additives are synthetic copies of natural substances: vanillin, for example, can be made synthetically identical to the natural substance vanillin found in the vanilla bean.[8] Still others, such as saccharin, do not occur in nature.

The legal definition goes so far as to consider the peas in a can of soup additives, although they are considered a food in a can of peas. In other words, something is not an additive because of what it is, but rather, because of how it is used.

In most cases, food labels do not tell the consumer why certain additives have been put into the food he or she buys. It may seem as though there is no reason for these chemicals to appear in our food. However, additives do perform certain important tasks. Additives fall functionally into several groups. (see Table 1.) The most important of these are the preservatives. They retard spoilage, keeping foods edible for long periods of time. Nitrites added to meat, for example, prevent the development of the botulin toxin; sodium benzoate "helps prevent the growth of bacteria, yeast and fungi that spoil food and cause food poisoning."[8]

Nutrients are another important class of additives; they consist of "minerals and vitamins...added to foods to restore

Table 1: Food Additive Groups and Functions.

Additive Group	Function
Anti-caking and free-flowing agents	Added to finely powdered or crystalline foods to prevent caking and lumping
Antimicrobial agents	Preservatives; prevent growth of microorganisms such as fungi and mold

Antioxidants	Preservatives; retard deterioration, rancidity, and discoloration due to oxidation
Colorings	Impart, preserve, or enhance color
Curing and pickling agents	Impart a unique flavor and/or color to a food, usually producing an increase in shelf life stability
Dough strengtheners	Modify starch and gluten, producing a more stable dough
Drying agents	Absorb moisture, maintain a low-moisture environment
Emulsifiers	Modify surface tension (maintain a desired consistency, especially used to keep oil-in-water mixtures mixed)
Enzymes	Improve food processing and the quality of finished food
Firming agents	Give firmness and texture
Flavor enhancers	Substances used to enhance, supplement, or modify the original taste or aroma of a food
Flavoring agents	Impart or help impart a taste or aroma in food
Flour treating agents	Added to milled flour to improve its color and/or baking qualities
Formulation aids	Promote or produce a desired physical state or texture in food; include carriers, binders, fillers, plasticizers, film-formers, and tableting aids
Fumigants	Control insects and pests
Humectants	Retain moisture
Leavening agents	Stimulate production of CO_2 in baked goods, causing them to rise
Lubricants and release agents	Added to food contact surfaces; prevent ingredients and finished products from sticking
Non-nutritive sweeteners	Substances which have less than 2% of the caloric value of sucrose per equivalent unit of sweetening capacity
Nutrient supplements	Substances which are necessary for the body's nutritional and metabolic processes
Nutritive sweeteners	Substances which have greater than 2% of the caloric value of sucrose per equivalent unit of sweetening capacity
Oxidizing and reducing agents	Chemically oxidize or reduce another food, making it more stable
pH control agents	Change or maintain active acidity or basicity; include buffers, acids, alkalies, and neutralizing agents
Preservatives	See Antimicrobial agents and Antioxidants
Processing aids	Enhance the appeal or utility of food; includes clarifying and clouding agents, catalysts, flocculents, filter aids, crystallization inhibitors, etc.
Propellants, aerating agents, and gases	Gases used to supply force to expel a product or to reduce the amount of oxygen in contact with the food in packaging
Release agents	See Lubricants
Sequestrants	Combine with polyvalent metal ions to form a soluble metal complex, to improve the quality and stability of products
Solvents and vehicles	Extract or dissolve another substance
Stabilizers and thickeners	Impart body, improve consistency or stabilize emulsions; include suspending and bodying agents, setting agents, jellying agents and bulking agents
Surface-active agents	Modify surface properties of liquid foods; include solubilizing agents, dispersants, detergents, wetting agents, rehydration enhancers, whipping agents, foaming agents, defoaming agents, etc.
Surface-finishing agents	Increase palatability, preserve gloss, and inhibit discoloration; include glazes, polishing waxes, and protective coatings
Synergists	React with another food ingredient to produce a total effect different or greater than the sum of the effects produced by the individual ingredients
Texturizers	Affect the appearance or feel of food
Thickening agents	See Stabilizers and thickeners

Information obtained from the Code of Federal Regulations, Title 21.

nutritional values lost in production or to supplement natural content."[9] Vitamin D added to milk, and iodine to salt, are nutrient additives which protect us from rickets and goiter,[9] respectively. Most of the other additives serve as enhancers of color, flavor, and texture. Their function is aesthetic and commercial—food producers hope that added appeal will lead to added consumption.

The food industry is under attack for using too many food additives. However, Jane E. Brody, a science writer for the *New York Times,* asserts that the additives are necessary because consumers want a large variety of foods available all the time.[8] Without additives this variety would not be possible.

Instant soup mixes are a good example of a convenience food made possible by additives. An article in *Consumer Reports* says: "Dried soup mixes are highly processed products. Their manufacturers use marginal amounts of food...then add a battery of additives to make sure the product has a long storage life and some palatability.... A dried soup mix might have food ingredients such as dehydrated chicken, carrots, parsley, onions, and so on. But it might also have salt for flavoring, MSG for flavor enhancement, mono- and diglycerides and sometimes polysorbate 60...guar gum, phosphates...silicates ...and thiamine hydrochloride.... And it might have added coloring to make the mixture look more appealing than it sounds."[10] The resulting product is highly convenient, takes very little time to prepare, and has a long shelf life.

Another example is the widely-used non-dairy creamer. Generally made from corn syrup solids, vegetable oil, and sodium caseinate (which, incidentally, is a protein derived from milk), non-dairy creamers may also contain a host of other additives. Borden's Cremora, for example, in addition to the substances listed above, contains dipotassium phosphate, monoglycerides, sodium-silico-aluminate, sodium beta carotene, riboflavin, and sodium tripolyphosphate. The label of one liquid non-dairy creamer reads: water, corn syrup solids, vegetable oil, sodium caseinate, disodium phosphate, carrageenan, guar gum, polysorbate 60, sorbitan monostearate, potassium sorbate, and artificial color. Airlines and restaurants like these concoctions because they don't need refrigeration. Although these creamers are considered safe, their caloric value is almost twice that of milk—8 oz. of milk has 160 calories, while 8 oz. of a non-dairy creamer has about 240. I happen to think they taste awful.

At least the additives in non-dairy creamers appear on the product's label. Under the laws enacted by Congress and administered by the FDA, many additives do not have to appear by name on labels. Some must be on the label when they are in certain foods, but not when they are used in others. This is a result of the registration of many foods in the CFR under "Standards of Identity." Explains Dr. Morris Matt, former professor of food science at St. Joseph's College in Philadelphia: "A standard of identity names and defines a particular food and specifies the amounts...of ingredients it must contain.... Foods with legal standards of identity and with no optional ingredients need not carry a list of ingredients on their label. In most instances when an optional ingredient is used, then such an ingredient must be declared on the label."[11]

Certain FDA labeling regulations do apply to all foods. All artificial flavoring, artificial coloring, or chemical preservatives must be listed on the label.[3] (p. 28) Although each individual

preservative must be named and identified as a preservative, flavorings and colorings need only be listed as "artificial flavoring" and "artificial coloring." Spices, natural flavors, and artificial flavors may be listed simply as spices, natural flavors, and artificial flavors (i.e., they need not be named specifically).[3] (p. 29)

As James S. Turner explains in *The Chemical Feast:* "There is no consistency.... Emulsifying agents, for example, must be labeled in pasteurized process cheese food, but the same agent need not be labeled in a different product called pasteurized process cheese. There are dozens of examples of this kind of confusion."[12] In addition, he says, there are "vague general categories that have no meaning.... 'Batter and breading ingredients' must be listed on the package of breaded shrimp, and ingredients identified only as 'other foods suitable for blending with cream cheese' are mandatory with certain cream cheese products."

All this confusion in labeling can have serious consequences. Substances which produce allergic reactions are getting *into* foods, but are not mentioned on labels. This presents a health hazard for people, like me, with food allergies. One researcher, whose work is much touted in the mass media, thinks that food allergies are precisely the cause of many physical problems, especially hyperkinesis, or hyperactivity, in children.[13] Dr. Ben F. Feingold, chief emeritus of the Department of Allergy at the Kaiser-Permanente Medical Center in San Francisco, reported in a 1973 editorial in *Hospital Practice*, "Clinical patterns involving practically every system of the body have been attributed to adverse reactions to [artificial] flavors and colors. Complete control of the symptoms can usually be effected by exclusion of the offending agent, while reintroduction of the chemical(s) is followed by a recurrence of symptoms."[13] Dr. Feingold's theory, however, is highly disputed in the scientific community. Many researchers, among them Carl Spring and Jonathan Sandoval, Department of Education of the University of California at Davis,[14] feel that Feingold's theory has not been substantiated by any controlled, scientific studies. Although they admit the plausibility of Feingold's ideas, they caution: "It is still an open question."

Allergies, of course, are not the only reason people fear food additives. Many people are seriously concerned that additives are carcinogenic. Indeed, some additives apparently *do* cause some types of cancer. Laboratory tests have found some evidence that several additives, including saccharin, cyclamates, and nitrites, are carcinogenic. Since 1950, the FDA has banned thirteen additives it considers carcinogenic, and proposed the banning of several others.[15]

On the other hand, numerous additives have been tested and found to be safe. Since 1972, the FDA has been testing over 400 food ingredients to determine if they are carcinogenic. So far, tests on 250 substances have been completed. An FDA Select Committee has evaluated the test results of 60 of the 250 substances. They recommended that most of the substances tested so far be declared safe. They did have some doubts, however, about caffeine, MSG, sugar, and nutmeg. Although the tests for these substances showed "no evidence of a hazard," the committee felt that because of numerous "uncertainties" in the test results, further studies should be made. All of the testing is expected to be completed, and the results available, this month.[16]

Still other evidence recently presented by cancer researchers indicates

that some additives may actually block, or stop, the production of cancerous cells in the body. Dr. Lee Wattenberg, professor of pathology at the University of Minnesota, reported at a symposium on the Environmental Determinants of Cancer that the antioxidants BHA and BHT, which are commonly added to cereals and baked goods, can block a rather large group of carcinogens.[17]

Unfortunately, this optimism about additive safety may not be completely warranted. Many people question the validity of the tests used in determining additive safety. Some scientists contend that the tests are not conclusive and "we cannot prove safety."[18] In fact, they argue, we haven't yet agreed on a definition of safety. According to Dr. Jean Mayer, former professor of nutrition at Harvard University and now president of Tufts University, "Usually the Food and Drug Administration determines the safety of an additive in terms of the often quoted maxim: 'There is no safe substance, there are only safe doses.' "[19] The current standard for carcinogenic risk—established by the "Delaney Clause" of the 1958 Food Additives Amendment to the Food, Drug, and Cosmetic Act—prohibits the use of any substance that "is found to induce cancer when ingested by man or animal." In other words, if a substance has any carcinogenic risk whatsoever, the FDA must ban it. But now many people, like Congressman James G. Martin, believe "it is time to accept the modern understanding that zero risk is impossible."[20] If we ban all substances that have a risk, he says, we would "ban the food supply." Reflecting this attitude, a committee of the National Academy of Sciences, after an 18-month study, recently proposed to Congress that the FDA set three levels of carcinogenic risk for food additives. This would allow the FDA to weigh the benefits of individual food additives against their drawbacks when deciding their regulatory status.[15]

Animal studies, virtually the only form of testing, are highly criticized. Says well-known activist and biologist Barry Commoner, "Laboratory animal strains have been intentionally bred into highly uniform populations...highly uniform in their sensitivity to carcinogens. In any one strain, each laboratory rat is very much like the next one; but...one strain, or species may be very different from the next."[21] One group of rats, then, may get cancer from a given substance, while another would not.

Animal testing is a rather inexact science. Explains Dr. Ken Stevenson, assistant professor of food microbiology at Michigan State University, scientists have neither the time nor the animals needed to study the effects of a substance in the long-term low-dosages to which humans are exposed. "There's no attempt made to try and make the doses equivalent,"[22] he says. Instead, scientists "feed much higher doses to smaller populations and make extrapolations." But making "extrapolations" is not a clear-cut process. In fact, the only sure way to know how a certain substance will affect two different species is to test it on both.[23]

Yet another problem surrounding additive testing is that of synergistic effects. We consume hundreds of additives *daily*, and although scientists know that many of those additives are harmless when taken alone, few, if any, studies have been made on the effects of additives when combined with other additives.[8] It seems possible that two harmless additives may combine to form a dangerous substance; or conversely, that two harmful additives may become harmless when combined. However, there may not be enough scientists or lifetimes to investigate all possible combinations.

Considering all this confusing evidence about additive safety, it is no wonder that many consumers have reacted with fear, apathy, or distrust of the FDA and its reports on additives.

Some people are demonstrating their concern by turning to so-called "natural" foods. "Natural" foods are usually made from organically grown ingredients and contain no chemical additives or preservatives. However, if you check the labels of some foods advertised as "all natural," you may find they also contain natural additives, like guar gum and carrageenan.[24]

Marilyn Stephenson, a dietician and nutritionist with the FDA's Bureau of Foods, says, "The terms 'organic,' 'natural,' and 'health' are so loosely and often interchangeably used that they are difficult to define—so much so that the FDA has taken no position on their use in food labeling.... One thing all health, organic and natural food products seem to have in common is that they cost the consumer more than conventional foods. A survey by the US Department of Agriculture indicated that the cost at the supermarket can run twice as much as for regular foods."[25]

And, after you pay that high price, you may well find that your "organically-grown" food really isn't. To be organically-grown, food must be grown without chemical fertilizers or pesticides of any kind—an expensive and difficult proposition. Unfortunately, says Stephenson, "The possibility for fraud is apparent when the consumer doesn't know if the storekeeper is honest, when the storekeeper can't tell if the distributor is honest, and when the distributor doesn't know if his suppliers are living up to their promises. Because of this and the premium prices placed on organic foods, it's not surprising that conventional foods at times have been substituted for organic foods."[25]

In the controversy over additives, the public has stereotyped "natural" as "good," additives as "bad". Yet Jelia Witschi points out, "There are also naturally occurring toxins in foods."[6] An article in *The Futurist* lists a few of them: carrots, for example, contain "carototoxin, a dangerous nerve poison; and myristicin, a hallucinogen.... Shrimp contain arsenic," potatoes have solanine—an alkaloid "that acts on the nervous system in much the same way as nerve gas.... Avocados, cheese, and bananas contain pressor amines that tend to raise some people's blood pressure."[26] The list goes on and on.

Food additives are clearly a confusing subject, but I don't think they need to be. A more informative labeling policy could help end a lot of the confusion, if not the controversy, over their use. At least with better labeling, we would have an opportunity to see exactly what additives are in food, and avoid these substances if we wanted.

First, all ingredients should be listed on all products. In addition, ingredients should appear under one name only. Many people would also like to know the percentages of the various ingredients in their foods. One suggestion has been to use a pie graph, which would show clearly and easily what is in the food, and how much of it there is.[27]

Part of the answer to ending the confusion over food additives is better consumer education. Studies show that over 50% of consumers today use product labels when shopping.[28] However, many consumers are not sufficiently educated to really understand the labels.[29]Obviously, no matter how complete the labels are, they won't help us if we can't understand them.

J.E. Tillotson, of Ocean Spray Cranberries, Inc., warns against trying to put too much information on a label. "Mandated label clutter could, in essence," he says, "return us to an era of functionally unlabeled food."[30] It would also be expensive and use a lot of room on the already over-crowded label. In addition, industry sources claim that because ingredients are always changing, keeping labels up to date would be impossible.[31] But I do not think that these problems eliminate the possibility of better labeling. Many people have ideas for different sorts of labels, or

other ways to get information to the consumer. Tillotson, for example, suggests that manufacturers produce "manuals of product information which would be available in retail outlets, libraries and schools.... The manual could go into complete detail on product information...."[30] It could also be updated as needed. Labeling is clearly a difficult problem, but one which we cannot ignore. We need labeling that will be helpful to the consumer without causing undue confusion and increased costs to the food processor.

After we solve the problem of additive labeling, we might turn to another labeling problem not currently addressed in the Food and Drug Act—the labeling of perishable foods. Packages sometimes carry a date stamped on them to let the consumer know when these foods are best used. This dating is the result of state action or voluntary labeling. But packages are not always dated in the same way by every state. Some may be stamped with the last date of sale, while others may be stamped with the last date of use. Some state-specific labeling laws could cause problems, as a recent milk strike in New York City showed. Milk was brought in from New Jersey, Connecticut, Pennsylvania, and New York State. The cartons were all stamped with different, and sometimes no, dates. Consumers had no way of knowing whether or not the milk was fresh.[32] I have also noticed, when shopping, that out-of-date foods are often left on shelves. On inquiring, I discovered that the stores are not required to take these expired items off their shelves, and they are not liable if you buy them!

Of course, labeling regulations as they now exist are not all bad. They guarantee that with all the processing our food goes through these days, we'll have, at least, an indication of some of the things used. Information about foods can help consumers make intelligent decisions at the supermarket; they have a right to know. We may wish that we could go back to the "good old days" when food came fresh from the fields and some ice cream parlors served bits of real vanilla bean in their vanilla ice cream, but we can't. There just aren't enough vanilla beans to go around! (Or, even if there are, they certainly are much too expensive.) Food additives are here for good. We must learn to live rationally with them.

Since food additives are going to be with us for a long time, we hope the accompanying tables will be of some help in lessening your anxiety the next time you do your shopping. Table 2, following, presents some representative food additives, identified by purpose and foods in which they may be found.

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Table 2. Some representative food additives, identified by their purpose and foods in which they can be found. (Compiled from the Code of Federal Regulations, Title 21, and information provided by the Center for Science in the Public Interest.)

Name	Purpose	Used In:
Acacia (gum arabic)	emulsifier, flavoring agent, formulation aid, stabilizer & thickener	beverages & beverage bases, chewing gum, confections & frostings, beer
Alpha-Tochopherol (Vitamin E)	antioxidant, nutrient supplement	vegetable oil
Ascorbic acid (Vitamin C)	antioxidant, nutrient, coloring	oily foods, cereal, soft drinks, cured meats
Bakers yeast extract	flavoring agent	soup
Beta carotene	coloring, nutrient supplement	margarine, shortening, nondairy creamers, butter
BHA (Butylated hydroxyanisole)	antioxidant	cereal, chewing gum, potato chips, oil, dried potatoes, yeast
BHT (Butylated hydroxytoluene)	antioxidant	cereal, chewing gum, potato chips, oil, dried potatoes
FD&C Blue No. 1	coloring	beverages, candy, baked goods
FD&C Blue No. 2	coloring	pet food, beverages, candy
BVO (Brominated vegetable oil)	emulsifier, processing aid (clouding agent), citrus flavoring	flavor oils used in soft drinks
Calcium disodium EDTA	preservative, coloring, flavoring	imitation mayonnaise, mayonnaise dressings, sauces, margarine, carbonated soft drinks, processed fruits, vegetables, & seafood
Calcium iodate	dough strengthener	bread
Calcium phosphate	anticaking agent, nutrient supplement	table salt, confectioner's sugar, malted milk powder, meat-curing mixes, onion and garlic salt
Calcium propionate	preservative	bread, baked goods
Calcium stearoyl-2-lactylate	dough strengthener, surface-active agent (whipping agent)	bread, baked goods, artificial whipped cream, processed egg white, dried potatoes
Carrageenan (a vegetable gum)	thickening agent, whitening agent, emulsifier	ice cream, jelly, chocolate milk, infant formula, non-dairy creamers
Castor oil	release agent	hard candy, vitamin tablet coatings

Citric acid	flavoring agent, sequestrant	ice cream, sherbet, fruit drinks, candy, carbonated beverages, dried potatoes
Citrus Red No. 2	coloring	skin of some Florida oranges (does not seep through to pulp)
Di-potassium phosphate	sequestrant	non-dairy creamers
Disodium guanylate	flavor enhancer	instant soup, processed Chinese foods
Disodium inosinate	flavor enhancer	instant soup, processed Chinese foods
Disodium phosphate	sequestrant	non-dairy creamers
Erythorbic acid	antimicrobial agent	cured red meat, carbonated beverages, breakfast cereal
Ethoxyquin	antioxidant	chili powder, paprika, ground chili
Ethyl alcohol	antimicrobial agent	pizza crust
Ferrous gluconate	coloring, nutrient supplement	black olives
Food starch-modified	thickening agent	soup, gravy, baby foods
Fumaric acid	flavoring agent	powdered drinks, pudding, pie fillings, gelatin desserts
Glutamic acid	flavoring agent	salt substitute
Glycerin (Glycerol)	humectant	marshmallows, candy, baked goods
Glycine	masking agent for bitter aftertaste of saccharin, stabilizer	saccharin sweetened beverages & beverage bases, oils
Guar gum	thickening agent, emulsifier, formulation aid, firming agent	baked goods, breakfast cereals, dairy products, fats & oils, gravies & sauces, jams & jellies, processed vegetables & vegetable juices, soups, non-dairy creamers
Gum ghatti	emulsifier	nonalcoholic beverages & beverage bases
Gum tragacanth	emulsifier, stabilizer, formulation aid	baked goods, baking mixes, condiments & relishes, fats & oils, gravies & sauces, meat products, processed fruits and fruit juices
Heptylparaben	antimicrobial agent	beer, noncarbonated soft drinks, fruit-based beverages
Karaya gum	formulation aid, stabilizer & thickener, emulsifier	frozen dairy desserts & mixes, milk products, processed cheese ice cream, soft candy, salad dressing
L-Cysteine	dough strengthener	baked goods, baking mixes
L-Cysteine mono-hydrochloride	dough strengthener	baked goods, baking mixes
Lactic acid	pH control agent (acidity regulator)	Spanish olives, cheese, frozen desserts, carbonated beverages
Lecithin	emulsifier, antioxidant	baked goods, margarine, chocolate, ice cream
Locust (carob) bean gum	stabilizer	baked goods, baking mixes, beverages & beverage bases-nonalcoholic, cheeses, gelatins, puddings & fillings, jams & jellies

Mannitol	nutritive sweetener, anticaking agent, flavoring agent, lubricant & release agent, stabilizer (texturizer), firming agent	chewing gum, low-calorie foods, cough drops, confections & frostings, jams, jellies, candy
Methylcellulose	processing aid (clarifying agent)	fruit juices, vinegar, wine
Methylenechloride	solvent	used to remove caffeine from coffee
Mono- and di-glycerides of edible fats or oils	emulsifiers	baked goods, margarine, candy, peanut butter, non-dairy creamers
MSG (Monosodium glutamate)	flavor enhancer	soup, seafood, poultry, cheese, sauces, stews, processed Chinese food
Oil of rue	flavoring agent	baked goods, baking mixes, frozen dairy desserts & mixes, soft candy,
Petroleum wax	formulation aid (masticatory substance), surface-finishing agent (coating), surface-active agent (defoamer)	chewing gum, cheese, fruit & vegetable coatings
Phosphoric acid	pH control agent (acidifier and buffer), sequestrant, emulsifier, nutrient supplement, discoloration inhibitor	baked goods, cheese, cured meat, carbonated beverages, breakfast cereal, dried potatoes
Polysorbate 60, 65 and 80	emulsifiers, surface-active agents (foaming agents, defoaming agents, and solubilizing agents), dough strengthener	baked goods, frozen desserts, imitation dairy products, non-dairy creamers, prepared mixes (nonalcoholic) for cocktails, protective coatings for raw vegetables & fruits, pickles
Potassium iodate	dough strengthener	baked goods
Potassium iodide	nutrient supplement	table salt, cereals
Potassium sorbate	preservative	non-dairy creamers, cheese, syrup, jelly, wine
Propyl gallate	antioxidant	oil, meat products, dried potatoes, soup bases, chewing gum
Propylene glycol	antimicrobial agent, emulsifier, humectant	shredded coconut, dried fruit
Quinine	flavoring	tonic water, quinine water, bitter lemon carbonated beverage
Rapeseed oil	stabilizer & thickener	peanut butter
FD&C Red No. 3	coloring	cherries in fruit cocktail, candy, baked goods
FD&C Red No. 40	coloring	soda, candy, gelatin, baked goods, pet food, sausage, drugs
Riboflavin	nutrient supplement, coloring	many foods
Saccharin (1,2-benziso-thiazolin-3-one-1, 1-dioxide ($C_7H_5NO_3S$))	non-nutritive sweetener	carbonated beverages, ice cream, candy, baked goods, diet products
Silicon dioxide	anticaking agent	flavored instant coffee

Sodium aluminosilicate (sodium silicoaluminate)	anticaking agent	dried soup mixes, non-dairy creamers
Sodium benzoate	antimicrobial agent	fruit juice, carbonated beverages, pickles, jams, jellies
Sodium bisulfite	preservative, bleach	canned potato chips
Sodium carboxymethylcellulose (CMC)	stabilizer, processing aid (prevents sugar from crystalizing)	ice cream, beer, pie fillings, icings, diet products, candy
Sodium caseinate	thickening agent, whitening agent	non-dairy creamers, ice cream, ice milk, sherbet
Sodium citrate	sequestrant, pH control agent (controls acidity)	gelatin desserts, jam, ice cream, candy
Sodium diacetate	antimicrobial agent, sequestrant	baked goods
Sodium nitrate	preservative, coloring, flavoring agent	bacon, ham, frankfurters, lunch meats, smoked fish, corned other processed meats
Sodium nitrite	preservative, coloring, flavoring agent	bacon, ham, frankfurters, lunch meats, smoked fish, corned other processed meats
Sodium phosphate	sequestrant	imitation sausage
Sodium propionate	preservative	pies, cakes, bread
Sodium silicoaluminate (see Sodium aluminosilicate)		
Sodium stearoyl-2-lectylate	emulsifier, dough strengthener, surface-active agent (whipping agent)	icings, fillings, puddings, toppings, baked goods, non-dairy c
Sodium tripolyphosphate	sequestrant	non-dairy creamers
Sorbic acid	antimicrobial agent	cheese, syrup, jelly, baked goods, wine, dried fruits
Sorbitan monostearate	emulsifier	cakes, candy, frozen pudding, icing, chocolate candy, non-d creamers
Sorbitol	anticaking agent, free flow agent, curing & pickling agent, drying agent, emulsifier, firming agent, flavoring agent, nutritive sweetener, sequestrant, thickening agent	shredded coconut, hard candy, cough drops, jams & jellies, dairy desserts, diet products, chewing gum
Sulfur dioxide	preservative, bleach	sliced fruit, wine, grape juice, dried potatoes, dried fruit, non-dairy creamers
Titanium dioxide	coloring	snack crackers
FD&C Yellow No. 5	coloring	gelatin dessert, candy, pet food, baked goods
FD&C Yellow No. 6	coloring	beverages, sausage, baked goods, candy, gelatin