United States Department of Agriculture
Food Safety and Inspection Service

Food Safety Information

Additives in Meat and Poultry Products

People have been using food additives for thousands of years. Today more than 3000 substances are used as food additives. Salt, sugar, and corn syrup are by far the most widely used additives in food in this country.

History of Food Additives

In prehistoric times, cavemen may have smoked meats to make them taste better. In coastal regions, early man probably soaked foods, including meat and poultry, in seawater for better flavor and for preservation. The spice trade between Asia, the Middle East, and Europe flourished because the public demanded the flavors that spices added to foods. Early explorers went in search of salt and spices, and wealthy Romans were kidnaped for ransom of salt and spices. Our ancestors discovered that large amounts of sugar helped preserve fruits.

What is a food additive?

"Food additive" is defined by the Food and Drug Administration (FDA) as any substance that--directly or indirectly--becomes a component or otherwise affects the characteristics of any food. This definition includes any substance used in the production, processing, treatment, packaging, transportation or storage of food.

Additives are used to maintain or improve safety, freshness, nutritional value taste, texture and appearance. The use of food additives has become more prominent in recent years due to the increased production of prepared, processed, and convenience foods.

What is a "direct" food additive?

According to the FDA, "Direct food additives are those that are added to a food for a specific purpose in that food." For example, using phosphates in meat and poultry products to retain moisture and protect the flavor.

What is an "indirect" food additive?

"Indirect food additives are those that become part of the food in trace amounts due to its packaging, storage or other handling," according to the FDA. For instance, minute amounts of packaging substances may find their way into foods during storage. Food packaging manufacturers must prove to the FDA that all materials coming in contact with food are safe before they are permitted for use in such a manner.

What is a color additive?

FDA defines a color additive as any dye, pigment, or substance which—when added or applied to a food, drug, or cosmetic, or to the human body—is capable (alone or through reactions with other substances) of imparting color. FDA is responsible for regulating all color additives to ensure that foods containing color additives are safe to eat, contain only approved ingredients, and are accurately labeled.

Color additives are used in foods for many reasons: 1) to offset color loss due to exposure to light, air, temperature extremes, moisture, and storage conditions; 2) to correct natural variations in color; 3) to enhance colors that occur naturally; and 4) to provide color to colorless and "fun" foods. Without color additives, colas wouldn't be brown, margarine wouldn't be yellow, and mint ice cream wouldn't be green. Color additives are now recognized as an important part of practically all processed foods we eat.

How are additives approved for use in foods?

Today, food and color additives are more strictly studied, regulated, and monitored than at any other time in history. FDA has the primary legal responsibility for determining their safe use. To market a new food or color additive (or before using an additive already approved for one use in another manner not yet approved), a manufacturer or other sponsor must first petition FDA for its approval. These petitions must provide evidence that the substance is safe for the ways in which it will be used. As a result of recent legislation, since 1999, indirect additives have been approved via a premarket notification process requiring the same data as was previously required by petition.

Who monitors the safety of food additives?

Before any substance can be added to food, its safety must be assessed in a stringent approval process. The Food Safety and Inspection Service (FSIS) of the U.S. Department of Agriculture (USDA) shares responsibility with FDA for the safety of food additives used in meat, poultry, and egg products. All additives are initially evaluated for safety by FDA.

When an additive is proposed for use in a meat, poultry, or egg product, its safety, technical function, and conditions of use must also be evaluated by the Risk, Innovations and Management Staff (RIMS) of FSIS, as provided in the Federal Meat Inspection Act, the Poultry Products Inspection Act, the Egg Products Inspection Act, and related regulations.

Although FDA has overriding authority regarding additive safety, FSIS may apply even stricter standards that take into account the unique characteristics of meat, poultry, and egg products. Several years ago, for instance, permission was sought to use sorbic acid in meat salads. Although sorbic acid was an approved food additive, permission for use in meat salad was denied because such usage could mask spoilage caused by organisms that cause foodborne illness.

Additives are never given permanent approval. FDA and FSIS continually review the safety of approved additives, based on the best scientific knowledge, to determine if approvals should be modified or withdrawn.

Why are food additives regulated?

During the early part of the first century in America, people lived off the land. They grew their own foods or bought them from someone they knew and trusted. There was no need for food safety laws. As the country grew and became more industrialized, the number of people who produced their own foods decreased drastically. Therefore, the nation depended on the newly emerging food industry to produce and distribute its food. Unfortunately, during the 1850's, there was much dishonesty concerning adding substances to foods.

The first efforts to pass laws to govern foods were state laws (1850 and beyond). These laws were difficult to enforce. The first major Federal law governing food was the 1906 Federal Food and Drug Act. It set the framework for the regulation of foods and stated that it was illegal to sell misbranded or adulterated foods and drugs in interstate commerce. It listed chemicals that were illegal to add to foods, such as borax or formaldehyde. The law was weak in that there was no method of enforcement and no punishment.

In 1938, the Federal Food and Drug Act was revised to account for changes in medical science and food technology and was renamed the Federal Food, Drug, and Cosmetic Act. Among the many provisions of the law was a requirement for truthful labeling of additives.

When did food additive regulations begin?

The 1958 Food Additives Amendment to the Federal Food, Drug, and Cosmetic Act provided for the first specific regulations of food additives. Approval of new food additives was required before they could be marketed, and the responsibility for proving their safety was placed on the manufacturer.

To use or market a substance to be used as a food additive, a company must first file a petition with the FDA outlining the tests that prove the substance to be safe under the proposed conditions of use. If it is approved as safe under the proposed conditions of use, FDA prescribes in its regulations, the types of foods it may be used in, and how it may be used.

Are any additives exempt from the approval process?

Yes. The Food Additives Amendment exempted two groups of food additives from FDA's testing and approval process. One is the list of substances known as "generally recognized as safe" (GRAS). This group includes a variety of substances, from commonly used flavorings and spices to phosphates and carrageenan. These substances are considered harmless under prescribed conditions of use. Past extensive use of these substances has produced no known harmful effects.

The other group of additives, known as "substances with prior sanction," was approved by USDA and FDA for use in foods prior to the passage of the 1958 Food Additives Amendment. Examples of these types of substances include potassium nitrite and sodium nitrite. Additives can be removed from the lists if tests indicate the substances are not safe for human consumption.

When were color additives addressed?

The 1960 Color Additives Amendment brought all colors, natural and synthetic, under the Food, Drug, and Cosmetic Act. Color additives may not be used to deceive consumers or to conceal blemishes or inferiorities in food products. Colors used in foods, drugs, and cosmetics must be approved by the FDA before they can be marketed.

The Food Additives Amendment and the Color Additives Amendments include the Delaney Clause, which prohibits the approval of an additive "if it is found to induce cancer when ingested by" people or animals, or "if it is found, after tests which are appropriate for the evaluation of the safety of food additives, to induce cancer in" people or animals. Any substance found to cause cancer is regulated under the general safety provisions of these laws, as well as by the Delaney Clause.

What are labeling requirements for additives?

The statutes and regulations to enforce the statutes require certain information on labels of meat and poultry products so consumers will have complete information about a product. In all cases, ingredients must be listed on the product label in the ingredients statement in order by weight, from the greatest amount to the least.

Substances such as spices and spice extractives may be declared as "natural flavors," "flavors," or "natural flavoring" on meat and poultry labels without naming each one. This is because they are used primarily for their flavor contribution and not their nutritional contribution. See www.fsis.usda.gov/PDF/Natural_Flavorings_on_Meat_and_Poultry_Labels.pdf

Substances such as dried meat, poultry stock, meat extracts, or hydrolyzed protein must be listed on the label by their common or usual name because their primary purpose is not flavor. They may be used as flavor enhancers, binders, or emulsifiers. They must be labeled using the species of origin of the additive, for example, dried beef, chicken stock, pork extract, or hydrolyzed wheat protein.

Color additives must be declared by their common or usual names on labels (e.g., FD&C Yellow 5 or annatto extract), not collectively as colorings. These labeling requirements help consumers make choices about the foods they eat.

Glossary of Commonly Used Meat and Poultry Additives and Terms

ANTIOXIDANT - substances added to foods to prevent the oxygen present in the air from causing undesirable changes in flavor or color. BHA, BHT, and tocopherols are examples of antioxidants.

BHT (butylated hydroxytoluene), BHA (butylated hydroxyanisole), TOCOPHEROLS (VITAMIN E) - antioxidants that help maintain the appeal and wholesome qualities of food by retarding rancidity in fats, sausages, and dried meats, as well as helping to protect some of the natural nutrients in foods, such as vitamin A.

BINDER - a substance that may be added to foods to thicken or improve texture. Some examples of binders in meat and poultry products are carrageenan, whey protein concentrate, food starch, and cellulose.

BROMELIN - an enzyme that can dissolve or degrade the proteins collagen and elastin to soften meat and poultry tissue. It is derived from pineapple fruit and leaves and is used as a meat tenderizer.

CARRAGEENAN - seaweed is the source of this additive. It may be used in products as binder.

CITRIC ACID - widely distributed in nature in both plants and animals. It can be used as an additive to protect the fresh color of meat cuts during storage. Citric acid also helps protect flavor and increases the effectiveness of antioxidants.

CORN SYRUP - sugar that is derived from the hydrolysis of corn starch. Uses include flavoring agent and sweetener in meat and poultry products.

EMULSIFIER - substance added to products, such as meat spreads, to prevent separation of product components to ensure consistency. Examples of these types of additives include lecithin, and mono- and di-glycerides.

FICIN - enzyme derived from fig trees that is used as a meat tenderizer.

GELATIN - thickener from collagen which is derived from the skin, tendons, ligaments, or bones of livestock. . Gelatin is a binder/extender and is only permitted in a few meat and poultry products. For example, it may be used in canned hams or jellied meat products.

HUMECTANT - substance added to foods to help retain moisture and soft texture. An example is glycerine, which may be used in dried meat snacks.

HYDROLYZED (SOURCE) PROTEIN - flavor enhancers that can be used in meat and poultry products. They are made from protein obtained from a plant source such as soy or wheat, or from an animal source, such as milk. The source used must be identified on the label.

MODIFIED FOOD STARCH - starch that has been chemically altered to improve its thickening properties. Before the starch is modified, it is separated from the protein through isolation techniques; therefore, the source of the starch used is not required on the label.

MONOSODIUM GLUTAMATE (MSG) - MSG is a flavor enhancer. It comes from a common amino acid, glutamic acid, and must be declared as monosodium glutamate on meat and poultry labels.

PAPAIN - an enzyme that can dissolve or degrade the proteins collagen and elastin to soften meat and poultry tissue. It is derived from the tropical papaya tree and is used as a meat tenderizer.

PHOSPHATES - the two beneficial effects of phosphates in meat and poultry products are moisture retention and flavor protection. An example is the use of phosphates in the curing of ham where approved additives are sodium or potassium salts of tripolyphosphate, hexametaphosphate, acid pyrophosphate, or orthophosphates, declared as "phosphates" on labels.

PROPYL GALLATE - used as an antioxidant to prevent rancidity in products such as rendered fats or pork sausage. It can be used in combination with antioxidants such as BHA and BHT.

RANCID/RANCIDITY - oxidation/breakdown of fat that occurs naturally causing undesirable smell and taste. BHA/BHT and tocopherols are used to keep fats from becoming rancid.

SODIUM CASEINATE - used as a binder in products such as frankfurters and stews.

SODIUM ERYTHORBATE - is the sodium salt of erythorbic acid, a highly refined food-grade chemical closely related to vitamin C, synthesized from sugar, and used as a color fixative in preparing cured meats. (Note: Erythorbate is NOT earthworms. Perhaps the spelling or pronunciation has contributed to this misconception because the Hotline receives many calls related to this concern.)

SODIUM NITRITE - used alone or in conjunction with sodium nitrate as a color fixative in cured meat and poultry products (for example, bologna, hot dogs, and bacon). Helps prevent growth of Clostridium botulinum, which can cause botulism in humans.

SUGAR (SUCROSE) - used as sweetener in an endless list of food products.

TEXTURIZERS/STABILIZERS/THICKENERS - used in foods to help maintain uniform texture or consistency. These are substances that are commonly called binders. Examples are gelatin and carrageenan.

WHEY, DRIED - the dried form of a component of milk that remains after cheese making. Can be used as a binder or extender in various meat products, such as sausage and stews.

To obtain more information about food additives:

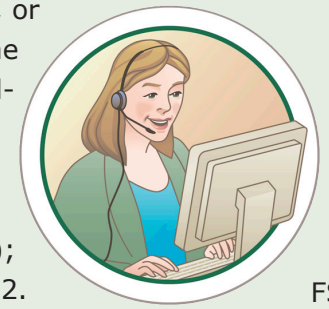
The more than 3000 total substances together comprise an inventory often referred to as "Everything" Added to Food in the United States (EAFUS).

www.fda.gov/food/ingredientspackaginglabeling/foodadditivesingredients/ucm115326.htm

Food Safety Questions?

Call the USDA Meat & Poultry Hotline

If you have a question about meat, poultry, or egg products, call the USDA Meat and Poultry Hotline toll free at **1-888-MPHotline (1-888-674-6854)**; TTY: 1-800-256-7072.



The Hotline is open year-round Monday through Friday from 10 a.m. to 4 p.m. ET (English or Spanish). Recorded food safety messages are available 24 hours a day. Check out the FSIS Web site at **www.fsis.usda.gov**.

Send E-mail questions to **MPHotline.fsis@usda.gov**.

AskKaren.gov

FSIS' automated response system can provide food safety information 24/7 and a live chat during Hotline hours.

Mobile phone users can access **m.askkaren.gov.**

PregunteleaKaren.gov

The USDA is an equal opportunity provider and employer.
Revised August 2014