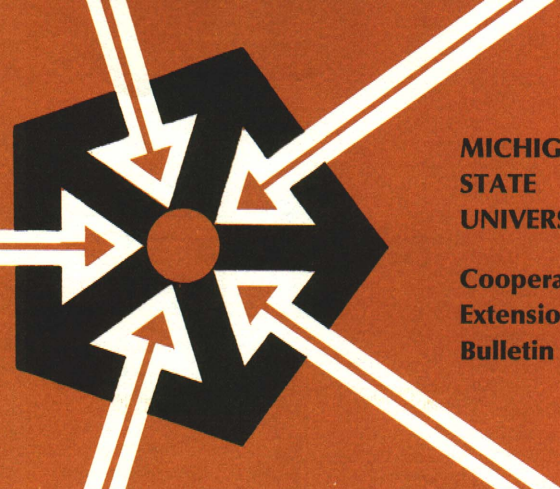


# NUTRITION VIEWPOINT

On the Everchanging Field of Human Nutrition

MICHIGAN  
STATE  
UNIVERSITY

Cooperative  
Extension Service  
Bulletin 742



## Food Additives and You

Number 2.  
in a series

**F**ood additives are essential in today's world. Our modern methods of food processing and distribution, our convenience, gourmet and low calorie foods, those out of season and those shipped long distances, almost all depend on the use of additives. In many ways our health, even our very style of existence, depends on food additives. Thus, the kinds of food additives and the number of foods with additives have increased markedly in recent years.

The use of food additives is carefully regulated and constantly monitored. Scientific research and safeguards imposed by our government attempt to assure us the safest possible foods within the limitations of our current knowledge, but evaluating food additives is difficult. It involves complex, comprehensive, time-consuming testing and observations on laboratory animals. It is complicated by (1) possible interactions of the experimental additive with other foods and chemicals, both natural and man-made; (2) variations in individual consumption and (3) variations in individual reactions to the additive. Even with new methods and techniques, it's difficult for scientists to explore all combinations of interacting factors before permitting the use of a new additive. It's also hard to predict possible effects on man from results obtained on test animals.

Currently, we are concerned that some food additives may cause cancer if ingested in substantial quantities over a period of time. Other concerns are the possible mutagenic (gene-changing), teratological (fetus-deforming) and toxic (poisonous) properties of additives. Many scientists believe there are safe levels of substances with such properties. Some suggest that given enough time, they could produce the same ef-

fects with almost any chemical and with many "natural" foodstuffs. But most agree that safety is never absolute and that decisions concerning additives must be made on the basis of evidence available at one point in time. If we want the constant supply of high quality foods made possible by additives, we may have to accept the risk of occasional undetected adverse effects.

### WHAT IS AN ADDITIVE?

It is "a substance or mixture of substances, other than a basic foodstuff, which is present in food as the result of any aspect of production, processing, storage or packaging." Additives fall into two groups—intentional and incidental.

**Intentional additives** are added to food for a specific purpose. Some improve flavor, color, texture or nutritional value. Others, such as yeast, mold and bacterial inhibitors, antioxidants, and anticaking compounds, improve keeping quality and facilitate food storage and shipping. Some convenience foods, like TV dinners and frozen main dish foods, require additives (antioxidants, stabilizers, emulsifiers, flavorings, etc.) to compensate for processing losses of flavor, color and texture and to preserve their freshness and pleasing appearance over long periods. Simulated foods also require additives to make them acceptable substitutes for such things as bacon, orange juice and cream. The new freeze-dry products need additives to replace flavor, texture and aroma lost during processing. More additives will no doubt be introduced to make such products even more acceptable.

**Incidental additives** find their way into food by way of fertilizers, pesticides and even packaging. Periodically certain pesticide tolerances are reduced or eliminated, and additive permits are revoked. Such well-publicized events cause a great deal of concern about the adequacy of present protection. Per-

haps, however, we should look on them as evidence that improved pesticide application methods, continued investigation and strict regulation are making our food increasingly safe.

### WHAT IS BEING DONE?

Both intentional and incidental additives are governed by the same laws. The United States basic food law is the Federal Food, Drug and Cosmetic Act of 1938. This act gives the Food and Drug Administration (FDA) primary responsibility for the safety and wholesomeness of our food supply. Three important amendments have strengthened the act.

**The Miller Pesticide Amendment** of 1954 provides for the establishment of safe tolerances (permissible amounts) for pesticide residues on raw agricultural commodities.

**The Food Additives Amendment** of 1958 requires premarketing clearance for substances intended to be added to food and for substances occurring in food during processing, storage or packaging. This amendment includes the Delaney clause which states that no chemical can be added to food if, in any amount, it produces cancer when ingested by man or animal.

**The Color Additive Amendment** of 1960 regulates the listing and certification of color additives. About 1,700 samples are examined annually by FDA scientists.

Prior to the 1958 Food Additives Amendment, FDA had to prove an additive was potentially harmful before it could obtain a court order banning its use. Today, the manufacturer must show FDA that an additive is safe under conditions of intended use before he is given permission to use it. FDA requires extensive testing on at least two species of laboratory animals but not on humans. The manufacturer must present a petition stating results of studies on or-

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gan and tissue function including the liver, brain, kidneys, blood forming organs, excretory and reproductive systems. FDA scientists review the petition. If they judge the proposed additive safe and effective, they issue a regulation permitting its use.

When the Food Additives Amendment was adopted, about 200 substances were exempted from the testing requirement because they were judged by experts to be "Generally Regarded as Safe" (GRAS) under conditions of their use in foods at the time. That GRAS list now includes nearly 600 items. About half are natural flavorings or their derivatives. Vitamins, minerals and other dietary supplements make up another large group.

In the decade since the GRAS list was formulated, better testing methods have been developed. Also, use of some GRAS list items has increased far beyond that at the time the list was composed. As a result, several of the items, including cyclamates, have been found to be of questionable safety and taken off the market. Currently the entire list is being reviewed and revised. FDA contracted with the National Academy of Sciences—National Research Council for the preliminary survey. Doubtful substances will undergo more intensive testing. Tighter restrictions will almost certainly be imposed.

Saccharin is an example of the GRAS list products that was recently reviewed. It has been used as an artificial sweetener for about 80 years, but its consumption has increased since the ban on cyclamates. (FDA banned cyclamates when a series of tests showed that rats developed bladder cancer from high levels of this artificial sweetener.) The National Academy of Sciences panel evaluated the use of saccharin and research relative to its safety; they concluded that present use levels are safe, but they urged more intensive study.

Other consumer safeguards may soon be forthcoming. FDA recently proposed the establishment of nutritional standards for manufactured and processed foods, such as frozen dinners, meat substitutes, cereals, breakfast drinks and infant formulas. The standards will specify minimum and maximum vitamin levels, make recommendations concerning trace minerals, and establish some standards for protein, carbohydrate and fat levels. FDA is also working on a labeling system that will provide the consumer with easy-to-understand information about the nutritive value of such foods.

## WHAT YOU CAN DO

Although scientific and legislative safeguards protect us, there is still much we can do to enhance the quality of our diets without becoming food faddists and without being unduly apprehensive about the quality of food.

### **Make a nutritious diet your goal. Don't be led astray by a fear of additives.**

— Learn to recognize and avoid food fads and fad diets. At least limit your use of them.

— Regard "health food" stores cautiously. Although you can sometimes buy from them special items available nowhere else, their products are usually higher priced and probably no more nutritious than food available at any supermarket. Some health food stores are operated in a less than sanitary manner.

— If you buy "organically grown" foods, be sure of your source. There is no legal definition established for the term, so anything can be labeled "organic."

— If you use pesticides in your garden, or on your lawn, flowers, or fruit trees, use them cautiously and follow directions exactly. (Directions on old containers—even those you put on your shelf last year—may be outdated. Check with your County Extension office before using them.) If you use pesticides in the house, keep them well away from food preparation activities. And, of course, keep them out of the reach of children and pets.

### **Vary your diet. It's more interesting, and you'll be less likely to consume an excessive amount of any one foodstuff or additive.**

— Learn to enjoy the wide variety of foods available.

— Avoid consuming a lot of any one food type. Choose from canned, frozen and fresh produce. Buy fresh fruits and vegetables in season and locally when practical. The quality may be higher, since fresh produce loses vitamins and some flavor if shipped long distances. Wash them to remove dirt and water soluble additives that may be present.

— Make the most of your "in-between" meals. Choose foods with nutritional value other than calories, rather than consuming lots of soft drinks, popcorn, potato chips or other snack foods. Try fresh fruit and vegetables and dairy or fruit juice beverages.

— Use convenience foods sparingly. They're time savers in emergencies, but the nutritional value of some of them is hard to determine. Some essential vitamins and minerals may be lost in processing; so it is wise to include fresh foods in the diet frequently.

### **Read labels. They help you choose foods with nutritional additives.**

— Select whole grain cereal products or choose enriched bread, rolls, cereals, flour and pastas. Enriched means that some of the nutrients lost during processing have been restored (riboflavin, niacin, thiamin and iron).

— Buy iodized salt. Iodine prevents simple goiter, the once-common disease that affects the thyroid gland.

— Choose milk fortified with vitamin D. Skimmed milk and non-fat dry milk are available with both vitamins D and A. Sufficient amounts of these vitamins are difficult to obtain from other sources. Vitamin D must be present for the body to use calcium, needed for proper bone and tooth development. Vitamin A contributes to normal growth, good vision and healthy skin.

— If you use margarine, choose one fortified with vitamin A.

— Avoid extreme consumption of highly fortified foods, such as the breakfast cereals that claim to contain all of the vitamins and minerals you need each day in one bowlful. Too much of some vitamins may be harmful.

### **Keep informed and up-to-date.**

Encourage public officials to maintain strong monitoring and testing programs for additives, and support legislation which strengthens such programs and provides adequate appropriations. Seek out dependable sources of information and aids to guide your choices and uses of food. Then continue to enjoy eating.

For more information read:

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