Those little 'extras' in our food

They're used to moisten, emulsify, preserve, inhibit mold, ehhance flavor, provide color. Food additives might be harder to imagine in Nebraska, where we drive by farmfields and livestock grazing right outside of town. But additives are in almost everything we eat today—for good or evil. Third Dimension writer Rich Tillson researched this controversial issue in detail.

LET'S SAY YOU ARE THE TYPICAL STUDENT staying up all night to study for midterms. About 2:30 a.m. you feel a familiar growling sensation in your stomach—the munchies. You head down to your friendly neighborhood vending machine for something to appease your innards. Peering into the little windows in the imposing maching, you see . . . ah, some Heistess "HaHas." The machine takes your quarter, and you pry open the door with a handy chair leg. Holding onto your edible treasure, you search for a way to quench your thirst. Another quarter, and a can of cola is purchased.

Sitting there with your banquet, mouth full of spongy goodness, you start reading the wrapper of your gustatory delight. "Made with sugar, shortening, enriched flour"—sounds good—"water, eggs, cocoa, corn sweetener, skim milk, salt"... Hmmhmm, what's this?..."mono- and diglycerides, sorbitan monostearate, polysorbate 60"—ugh—"lecithin (emulsifiers), artificial flavor, sorbic acid..."

Photo by Scott Svoboda

Fred Caporaso, assistant professor of food and nutrition: You can't get a balanced viewpoint.

In desperation, you turn to your cola can. ". . .levulose, phosphoric acid, caffein, gum arabic. . ." Gaahhhhh! Your paranoia from lack of sleep overcomes you, and such ominous-sounding chemicals hound you all the way back home. Don't worry. . .the feeling that it's healthier to starve to death than to eat will be gone in the morning.

Just what are food additives, those things on labels that read like an organic chemistry final? Why are they in the things we eat?

"Food additives are a very controversial issue," said Fred Caporaso, professor in the Food and Nutrition Dept. "Most of the literature on the subject is biased on one side or the other. It's been made into a black or white issue, rather than a grey one."

"There have been some legitimate questions about additives, and the concern is good. But there have been some unsubstantiated accusations as well. One thing we have to keep in mind is that food is chemicals (naturally). If we were to list all the individual constituents of a potato by their chemical names, it would be a long and incomprehensible list to most consumers."

The federal Food and Drug Administration ultimately is responsible for regulating kinds and amounts of additives in foods. In 1906 the first Pure Food and Drug Act was passed by Congress. But testing products proved hard. Poison control squads roamed around and ate products, and if they got sick, they published the name of the manufacturer.

THE 1938 FOOD, DRUG AND COSMETICS ACT required the FDA to insure the quality of these products. The act has been amended several times.

The 1954 amendment set up tolerable pesticide levels in food. The 1958 food additives amendment required the FDA to prove the safety of all chemical additives before their use in food. This amendment included the "Delaney Clause" that flatly forbid the use of any chemical in food found to induce cancer in animals or man. This was amended in 1962 to allow a cancer-causing drug to be fed animals as long as there were no detectable residues in the edible portions of the animal. In 1960 color additives were added to the list under regulation.

According to John McAuliaffe, branch chief of the Division of Food and Color Additives of the FDA in Washington, most substances are pretested before marketing, but some are exempted because they are already on an "accepted" list.

A potential user of a new additive must submit a petition to the FDA, which in turn sets up a format for testing.

"The burden of proof is on the petitioner," McAuliaffe said. "They have to prove safety of the product at the proposed level of use. If the data they provide is not sufficient, the FDA directs them to do more testing."

When enough data are presented the FDA publishes the report and proceeds with the evaluation. Thirty days are allowed for objections to be raised to the product or its proposed use.

Testing is done on animals, usually laboratory rats. Companies developing a new additive must do testing themselves or contract with an independent laboratory. Either way, it's an expensive process, mostly because of the large numbers of animals used.

Accusations have been made that the testing procedures are inadequate. Charges also have been leveled that companies with a vested interest in getting a new additive on the market test incompletely or may ignore or delete data in their reports to the government.

The case of the proposed artificial sweetener "aspartane" seems to bolster some of these worries. Aspartane seemed to be what industry had been looking for since the 1969 ban on cyclamates. Cyclamates, a once-widespread type of artificial sweetener, were shown to be carcinogenic (cancer-causing) and were pulled off the market. The main ingredient of aspartane, aspartic acid, was tested by the developing company, the results were approved by the FDA, and the company began developing a market for it. The market would prove to be tremendous: candy, soft drinks, cereals, sugar coatings on pills, etc.

Photo by Kevin Higley

Roy Arnold, chairman of the Food Science and Technology Dept.: The FDA is changing its role.

But two independent researchers, James Turner and John Olney, then presented evidence the FDA had not considered. Aspartic acid, in combination with monosodium glutamate (MSG), could cause brain atrophy in test animals, particularly baby rats, MSG is a flavor enhancer present in a wide variety of foods, including baby foods. It seems fortunate this combined chemical effect was discovered, as both chemicals would be present in food consumed by children.

The status of aspartane, for the time being, is "unmarketable."

This example illustrates the major objection to the present form of testing new additives—that there is no provision for testing synergistic effects, that is, chemicals reacting with other chemicals. Who can tell what a new additive will do with any of the thousands of chemical substances now present in food and drugs?

Another objection is that the test animals used are not close to humans, either physically or physiologically. This means a chemical that is harmless to a rat could harm a human, or vice versa. As a result, some have said new products are tested twice—once on laboratory rats and once on the whole American population when the product is marketed.

Asked if he believes the testing on new additives is adequate, McAuliaffe replied:

"Until recently, the FDA has taken the data received from private sources at face value. There is a good possibility that some companies have manufactured data, but most are reliable." Senator Kennedy (D-Mass.) recently sponsored a bill to give the FDA approximately $16 million to strengthen the program on monitoring data and setting quality laboratory standards."

Roy Arnold, chairman of the UNL Department of Food Science and Technology, said he believes more responsibility for food safety is being placed on industry.

"The FDA is getting away from the inspector and enforcer role to helping industry develop contamination-prevention programs and testing procedures," he said. The FDA, Environmental Protection Agency (EPA and other agencies are in the process of screening and testing some of the older additives for hazards to health.

"YOU WON'T FIND A FOOD PROCESSOR WHO wants to put out a dangerous product," Arnold added.

Additives used by the food industry include moisteners, emulsifiers, preservatives, mold inhibiters, antibacterial agents, flavor enhancers, color additives, nutritional additives like protein concentrates or vitamins and many others It is hard to find a processed food product without least two or three additives listed on the label. More may be present but not listed. Industry claims that additives improve the products in nutritional value, convenience, shelf life, or by adding protection against contamination.

A book by Ralph Nader's Student Study Group (project director James S. Turner)' *The Chemical Feast*, published in 1970, shows the opposite end of the opinion spectrum.

"The conviction of the FDA, that the benefits of proposed new food products must be weighed against their possible hazards, has misled the FDA into allowing many products on the market in spite of their known potential danger," the book reads. "But the law does not ask for a balance: The Food, Drug, and Cosmetic Act unequivocally states that no food additive can be introduced into the food supply unless its proposed use is shown to be safe. . .

"The possible hazards of a new chemical are most often balanced against benefits to industry, not benefits to the consumer. Most food additives are used to enhance the profits of industry, not benefits to the consumer.

"The United States could get along perfectly well without the use of the 2,000 to 3,000 additives now routinely added to food. In fact, it could probably get along, as do many other nations, using fewer than one percent

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Photo by Scott Svoboda

Food processing in Lincoln: workman at Prairie Maid Meats, Inc., supervises sausage-grinding machines to make ring bologna. Ring bologna is made with beef, pork and spices, a spokesman said. No artificial substances are added to this product.