

Chapter 20

Use with Section 2

ENRICHMENT

● Ionic and Covalent Bonds

Food Additives

Many of the foods we eat include some kind of additive. Sometimes additives are used to improve the appearance of the food, as is quite often the case with fruits. Antioxidants are sometimes added to cut fruits so that they won't turn brown as quickly as they would otherwise. In addition, desserts and soft drinks often have artificial sweeteners added to keep the overall caloric count low without affecting the taste adversely.

People have been using food additives for centuries. Before refrigeration, people used to pickle or cure their foods to keep the food from spoiling. While pickling and curing still take place, the refrigerator and freezer have made these methods less of a necessity than they once were.

A common ionic substance, curing salt, is used to help preserve ham, bacon, sausage, and most other cured meats. At first, this was thought to be a wonderful way to reduce the risks of botulism, which is extremely dangerous and oftentimes fatal. As time went on, however, scientists discovered that the very ionic properties that prevent the growth of bacteria also cause cancer.

The ion nitrate used in curing is converted to nitrite by enzymes or bacteria. The nitrite then prevents the bacteria from growing. Both nitrate and nitrite help in producing the pinkish coloring in some meat. Unfortunately, nitrite also interacts with a substance called amine. Amine is found in all meats. When nitrite and amine react at high temperatures they produce a group of chemicals called nitrosamines. Nitrosamines have been found to cause cancer in every species of animal they have been tested on. In order for the chemical reaction that produces nitrosamines to take place, the meat must be cooked at very high temperatures. Any meat that is fried is at a greater risk of having nitrosamines produced.

Answer the following questions in the space provided. Use complete sentences.

1. Why are food additives used?

2. How was most food preserved in the past and what inventions changed that?

3. Why are nitrates used to help preserve food?

4. Is it accurate to say that curing salts are both beneficial and harmful? Why or why not?
