

FOOD POISONING

How Food Spoils

It is important to know the difference between organisms that cause foods to spoil – to rot or turn bad – and those that can cause food poisoning.

A major difference is the temperature the two types like. Most food poisoning bacteria like room temperatures (around 60-90°F). They don't grow at low refrigerator temperatures. By "grow" we mean that bacteria divide, multiplying in number.

But food spoilage organisms – like some bacteria, yeasts and molds – can grow at lower temperatures. Even when food is in the refrigerator at temperatures as low as 40°F, these spoilage agents can continue to reproduce.

While it's hard to be grateful for them, most food spoilage organisms at least make themselves known. The food looks or smells awful. That's a help – you know to throw it out.

The Food Poisoners

Unfortunately, the bacteria that commonly cause food poisoning – with its mild-to-severe intestinal flu-like symptoms – are not nearly so obvious.

Most of them can't be seen, smelled, or tasted. The smartest way to handle the food poisoners is to make life so hard they can't multiply enough to cause trouble.

But before, we talk in detail about prevention, let's meet these troublemakers.

Staphylococcus aureus is the scientific name for a small, round organisms that is a leading cause of food poisoning.

We literally carry staph with us all of the time. It lives in our noses and on our skin. You can find it in concentrated form in boils, pimples and other skin infections.

When transmitted to food, usually by handling, staph starts growing. At warm temperatures – 100° F is ideal – certain types of staph multiply rapidly and produce a toxin or poison that makes people sick.

Staph symptoms? Nausea, vomiting, and diarrhea usually appear 2 to 6 hours after eating staph infected food, and last a day or two. The illness is usually not too serious in healthy people.

While cooking kills most bacteria, the staph toxin is not destroyed by ordinary cooking. So you must be very careful in handling food to prevent staph from growing enough to produce toxin.

Don't let prepared foods – particularly starchy foods, cooked and cured meats, cheese and meat salads – sit out at room temperature over 2 hours. Staph is often associated with these foods.

Salmonella—which appears as short, thin rods under the microscope—is another major cause of food poisoning in this country.

Actually, salmonella is the name used for some 2,000 closely related bacteria that cause more severe flu-like symptoms than staph—diarrhea, vomiting, fever. Infants and young children, the ill, and the elderly may be seriously affected. Symptoms normally appear 12 to 36 hours after eating, and may last 2 to 7 days.

Salmonella continually cycles through the environment in the intestinal tracts of people and animals.

The bacteria are often found in raw or undercooked foods, such as poultry, eggs, and meat. Unpasteurized milk can also contain salmonella.

Control is a simple matter, though, because thorough cooking kills salmonella.

Perfringens, full name *Clostridium perfringens*, ranks third as a cause of food poisoning. It, too, is present throughout the environment—in the soil, the intestines of animals and humans, and in sewage.

Perfringens differs from staph and salmonella, however, in two ways. First, it's anaerobic, which means it grows only where there is little or no oxygen. Second, it produces two kinds of cells.



S. aureus



Salmonella



The normal perfringens cell is the unpleasant one – it produces the poison which makes you sick. But perfringens has a spore cell too, which can survive circumstances that knock out the normal cells.

These spores are tricky, because at temperatures between 70°F and 120°F, they can become normal cells again, multiplying quickly to disease-causing levels.

Perfringens shows its ugly side – usually diarrhea and gas pains – some 8 to 24 hours after consumption. While the symptoms often end within a day, people with certain medical conditions – ulcer patients, for instance – can be seriously affected.

Called the “cafeteria germ” because it often strikes food served in quantity and left for long periods on a steam table or at room temperature, perfringens is often found in cooked beef, turkey, gravy, dressing, stews, and casseroles.

Paying special attention to refrigeration and dividing large portions into smaller dishes for serving, help to stop perfringens from growing. Dividing buffet foods into several small dishes exposes more of the food to the air, thus reducing the anaerobic conditions that this bacteria love.

Botulism, while very rare, is the deadly food poisoning caused by *Clostridium botulinum*. Although it needs just the right conditions to develop, botulism is clearly a danger because the spores are always around in soil and water.

Like perfringens, the botulinum bacteria – rod-shaped under the microscope – grow best in anaerobic (reduced oxygen) conditions. Since the canning process forces air out of the food, the botulinum bacteria may find improperly canned foods as a good place to grow.

Low-acid vegetables such as green beans, corn, beets, and peas, which may have picked up botulinum spores from the soil, are at risk. The risk is greater if they are home-canned, and safe canning procedures have not been followed precisely.

Like the perfringens spore, the botulinum spore is tough. While high cooking temperatures will kill the normal botulinum cell, it takes still higher temperatures to kill the spore. That’s why canning is done with a pressure canner. If the spores are not killed in the canning process, they can become normal cells again and produce the deadly poison.

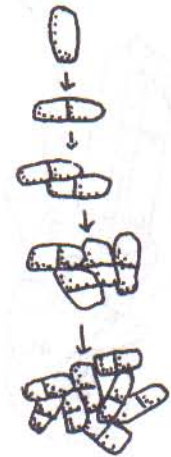
If you eat botulinum-contaminated food, symptoms will develop in 12 to 48 hours. The poison attacks the nervous system, causing double vision, droopy eyelids, trouble swallowing and difficulty breathing. Without treatment, a patient can die of suffocation – the nerves no longer stimulate breathing.

There is an antitoxin, which has reduced the number of deaths from botulism, but patients may still suffer nerve damage, and recovery is often slow.

To avoid botulism, carefully examine any canned food, especially home-canned food, which looks suspicious. Danger signs are milky liquids (that should be clear) surrounding vegetables, cracked jars, loose lids, and swollen cans or lids.

Don’t use canned goods showing any of these signs. Don’t even taste them! Even a very small amount of botulinum toxin can be highly dangerous.

Throw suspect canned goods away, carefully. You don’t want animals, children, or anyone else who might rummage through the trash to get ill. Wrap the cans in plastic, then in heavy paper bags, for deposit in a secure trash can.



C. botulinum

