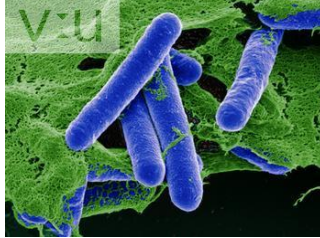


## List of Potential Food Safety and sanitation problems Iowa FFA Food Science CDE

### Botulism



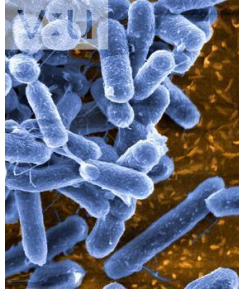
Can be found in improperly canned goods

Botulism can be caused by foods that were canned or preserved at home. Maybe you've had fruits or vegetables that someone picked from the garden in the summer and jarred so they could be eaten during the winter months. These foods need to be cooked at very high temperatures to kill the germs.

If not, bacteria called *Clostridium botulinum* could cause botulism in the people who eat the food. You can't always see, smell, or taste these bacteria, but they release a poison, also called a toxin. This toxin travels through the blood to attach to the nerves that control muscles. From several hours to a week after eating contaminated food, the person may get sick.

Botulism is caused by a group of paralytic neurotoxins produced by the spore-forming, anaerobic, gram-positive bacillus *Clostridium botulinum*. Intoxication can occur naturally from contaminated foods or rarely as a result of wound or intestinal colonization in humans. There are seven types of botulinum toxins, A through G, although only A, B, E and F have been implicated in the poisoning of humans. Botulism is classified as a Category A bioterrorism agent because of its ease of dissemination and high mortality rate. When used as a biological weapon, botulinum toxin is most likely to be dispersed as an aerosol for inhalation, although it could be added to the food or water supply.

## E Coli



E. coli is a common type of [bacteria](#) that can get into food, like beef and vegetables. E. coli is short for the medical term Escherichia coli. The strange thing about these bacteria — and lots of other bacteria — is that they're not always harmful to you.

E. coli normally lives inside your intestines, where it helps your body break down and digest the food you eat. Unfortunately, certain types (called strains) of E. coli can get from the intestines into the blood. This is a rare illness, but it can cause a very serious infection.

Someone who has E. coli infection may have these symptoms:

- bad stomach cramps and belly pain
- vomiting
- [diarrhea](#), sometimes with blood in it

One very bad strain of E. coli was found in fresh spinach in 2006 and some fast-food hamburgers in 1993. Beef can contain E. coli because the bacteria often infect cattle. It can be in meat that comes from cattle and it's also in their manure. Manure in your food? How does that happen? Not on purpose, of course, but it can happen if the manure is used for fertilizer or if water contaminated with E. coli is used to irrigate the crops.

## Cross Contamination problems



Cross contamination is the contamination of a food product from another source. There are three (3) main ways cross contamination can occur:

- Food to food.
- Equipment/utensil to food.
- People to food

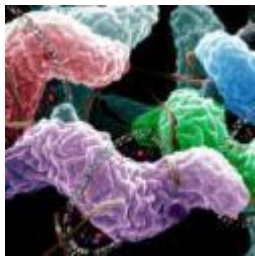
## Salmonella



### Salmonella:

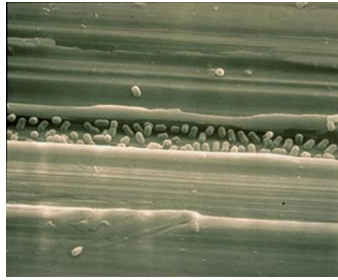
Salmonella is a Gram-negative bacterium. Salmonella is a bacterium that causes one of the most common enteric (intestinal) infections in the United States – Salmonellosis. In some states (e.g. Georgia, Maryland), salmonellosis is the most commonly reported cause of enteric disease, and overall it is the second most common bacterial foodborne illness reported (usually slightly less frequent than Campylobacter infection).

### Campylobacter:



*Campylobacter* [pronounced "kamp-e-lo-back-ter"] is a gram negative, microaerophilic bacterium and is one of the most common bacterial causes of diarrheal illness in the United States. *Campylobacter jejuni*, the strain associated with most reported human infections, may be present in the body without causing noticeable illness. *Campylobacter* organisms can be found everywhere and are commonly found in the intestinal tracts of cats, dogs, poultry, cattle, swine, rodents, monkeys, wild birds, and some humans. The bacteria pass through the body in the feces and cycle through the environment. They are also found in untreated water.

## Listeria



Listeria infections (known as listeriosis) are caused by the bacterium *Listeria monocytogenes*. Infection is rare, but when it does occur it most frequently affects pregnant women in their last trimester, newborns, and children and adults whose immunity is weakened by diseases such as cancer or AIDS. People who have had various types of transplants are also more at risk for listeriosis.

Listeria bacteria can be transmitted through soil and water. A person can also ingest listeria by eating certain foods, such as deli meats and cold cuts, soft-ripened cheese, milk, undercooked chicken, uncooked hot dogs, shellfish, and coleslaw made from contaminated cabbage. Many cases of infection, however, have no identifiable source. *Listeria* are mainly soil bacteria, though as a pathogen they are food-borne. They are intracellular pathogens that use actin filaments within the host cell for their motility. *L. monocytogenes* is the causative agent of listeriosis

## Staphylococcus

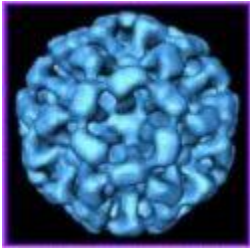


Staphylococcus (in Greek staphyle means bunch of grapes and coccus means granule) is a genus of Gram-positive bacteria. Under the microscope they appear round (cocci), and form in grape-like clusters.

The Staphylococcus genus includes thirty-one species. Most are harmless and reside normally on the skin and mucous membranes of humans and other organisms. Found worldwide, they are a small component of soil microbial flora.

Staphylococcus can cause a wide variety of diseases in humans and other animals through either toxin production or invasion. Staphylococcal toxins are a common cause of food poisoning, as it can grow in improperly-stored food. One pathogenic species is Staphylococcus aureus, which can infect wounds.

## Norovirus



Noroviruses are a group of viruses that cause the “stomach flu,” or gastroenteritis (GAS-tro-en-ter-I-tis), in people. The term norovirus was recently approved as the official name for this group of viruses. Several other names have been used for noroviruses, including:

- Norwalk-like viruses (NLVs)
- caliciviruses (because they belong to the virus family Caliciviridae)
- small round structured viruses.

Viruses are very different from bacteria and parasites, some of which can cause illnesses similar to norovirus infection. Like all viral infections, noroviruses are not affected by treatment with antibiotics, and cannot grow outside of a person’s body.

Norovirus illness is usually brief in healthy individuals. When people are ill with vomiting and diarrhea, they should drink plenty of fluids to prevent dehydration.

Dehydration among young children, the elderly, the sick, can be common, and it is the most serious health effect that can result from norovirus infection. By drinking oral rehydration fluids (ORF), juice, or water, people can reduce their chance of becoming dehydrated. Sports drinks do not replace the nutrients and minerals lost during this illness.

## Parasites – [www.thelifetree.com](http://www.thelifetree.com)



Parasites are organisms that derive nourishment and protection from other living organisms known as hosts. They may be transmitted from animals to humans, from humans to humans, or from humans to animals. Several parasites have emerged as significant causes of foodborne and waterborne disease. These organisms live and reproduce within the tissues and organs of infected human and animal hosts, and are often excreted in feces.

How are they transmitted?

They may be transmitted from host to host through consumption of contaminated food and water, or by putting anything into your mouth that has touched the stool (feces) of an infected person or animal.

How do they vary?

Parasites are of different types and range in size from tiny, single-celled, microscopic organisms (protozoa) to larger, multi-cellular worms (helminths) that may be seen without a microscope.

What are some common parasites?

Some common parasites are *Giardia duodenalis*, *Cryptosporidium parvum*, *Cyclospora cayatanensis*, *Toxoplasma gondii*, *Trichinella spiralis*, *Taenia saginata* (beef tapeworm), and *Taenia solium* (pork tapeworm).

## Employee hygiene

### Food Safety and Sanitation Program

The NIH Food Safety Program provides periodic comprehensive environmental hygiene inspections of all NIH affiliated cafeterias, snack bars, beverage stations/carts, child care facilities and the Clinical Center Nutrition Kitchen, both on- and off-campus. These inspections are conducted by a certified food safety professional. Inspections of these facilities include reviews of the physical structure, food protection practices, food service employee hygiene behavior, equipment cleanliness, solid and liquid waste disposal procedures, pest management protocols and general sanitation.

Food service facility plan reviews, employee training activities, enforcement procedures, and consultative sessions relating to food hygiene and public health sanitation are conducted by the NIH Food Safety Program Manager.

Reports on food protection and other public health consultations are furnished to Division of Employee Services (DOES). Food complaints and possible food borne disease outbreaks associated with NIH facilities are investigated and evaluated. Compliance with current acceptable food safety practices is achieved through enforcement meetings and re-inspections.



### Danger Signs:

- Dirty public areas
- Dirty tables, crockery, cutlery and glassware
- Dirty toilets and hand washing areas
- Overflowing bins or bags of rubbish outside the premises
- Staff with dirty hands or fingernails, nail polish, dirty aprons, or long hair that isn't tied back
- Raw foods displayed next to ready to eat foods
- Use of the same utensils for raw and ready to eat foods
- Foods on display past its 'Use by' date
- Hair, insects or other foreign objects in food.

## Metal contamination in ground beef



Refer to: <http://www.bifsc.org/uDocs/bestpracticesforretail4-05.pdf>

For a PDF document on ‘best practices for producing ground beef’.

## Rodent control



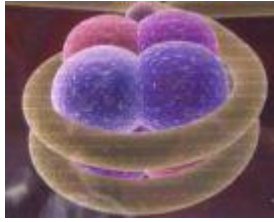
Prevent contact with rodents by cleaning up your home, workplace, or campsite.

Eliminate possible rodent food sources:

- Keep food in thick plastic or metal containers with tight lids.
- Clean up spilled food right away and wash dishes and cooking utensils soon after use.
- Keep outside cooking areas and grills clean.
- Always put pet food away after use and do not leave pet-food or water bowls out overnight.
- Keep bird feeders away from the house and utilize squirrel guards to limit access to the feeder by squirrels and other rodents.
- Use a thick plastic or metal garbage can with a tight lid.
- Keep compost bins as far away from the house as possible (100 feet or more is best).
- Keep grains and animal feed in thick plastic or metal containers with tight lids. In the evening, uneaten animal feed should be returned to containers with lids.
- If storing trash and food waste inside the home, do so in rodent-proof containers, and frequently clean the containers with soap and water. Dispose of trash and garbage on a frequent and regular basis, and pick up or eliminate clutter.
- Eliminate possible nesting sites outside the home. Elevate hay, woodpiles, and garbage cans at least 1 foot off the ground.



## Antibiotics in food



Overuse of animal antibiotics threatens human health

Giving antibiotics to farm animals results in the emergence of resistant bacteria with potentially calamitous consequences for human health, warns a report from the United Kingdom Advisory Committee on the Microbiological Safety of Food.

The committee, which was set up to provide the government with independent expert advice, says that it is clear that some of the resistant strains seen in food animals are capable of infecting humans. Moreover, the ability of micro-organisms to transfer resistance "adds to the concerns about multiple resistant strains like [Salmonella typhimurium] entering the food chain."

The report recommends reduced reliance on the use of antimicrobials in food animal production and urges regulatory authorities to consider the resistance problem before authorizing veterinary medicines.

Members of the committee backed the recent European Union ban on using as growth promoters certain antibiotics that are closely related to those used in human medicine. The report stated: "Having considered the matter very carefully, we concluded it would be prudent to phase out the use as growth promoters of spiramycin, tylosin phosphate and virginiamycin which might give rise to resistance to clinical antibiotics. We felt, additionally, that those remaining for use as growth promoters ♦ avilamycin, bambamycin, bacitracin zinc, monensin sodium and salinomycin ♦ should be more closely controlled, with regular reviews of possible implications in human medicine."

Although the report says that there is conclusive evidence that giving antibiotics to animals results in the emergence of some resistant bacteria that infect humans, it points out that the extent to which this contributes to the overall problem of bacterial antibiotic resistance in humans is uncertain. It notes: "For more than a year we have tried, unsuccessfully, to discover the amounts of antibiotics used in animals in the United Kingdom, the species of animals in which they were given, and the purpose of administration. We recognize that much of this information is commercially sensitive or difficult to assemble. We nevertheless believe that a robust system to gather this information should be put in place as soon as possible."