

Pathogens of high concern to the food industry

Dupray Industries inc.

Source: Canadian Food Inspection Agency

	<i>E. coli (Escherichia coli - O157:H7)</i>
Description	A bacteria found inside human and animal intestines. 4 different classes of E coli cause diarrhoea in humans. The strain of most concern in food processing is O157:H7.
Products of concern	Meats, cheese, vegetables, non pasteurized beverages.
Source of contamination	Faeces of humans or animals that have come in contact with the food.
Symptoms	Stomach cramps, nausea, vomit, diarrhoea
Other Complications	10% of contaminated persons might develop Hemolytic uremic syndrome.
Population in Concern	Everyone, particularly children and elderly.
Elimination	The bacteria is eliminated after a few minutes at 71°C or a few seconds at over 160°C. Studies show that after a 30 second exposure to 160°C 99.9 % of the bacteria are eliminated.

	<i>Listeria monocytogenes</i>
Description	A sickness caused by a group of gram positive bacteria that is distributed in the environment which can be present in intestines of humans and animals.
Products of concern	Raw and cooked meats, soft cheeses, raw vegetables
Source of contamination	The bacteria is in the environment and can be transferred through the different trophic levels resulting in affecting humans.
Symptoms	Fever, muscle pains, nausea, diarrhoea.
Other Complications	Death, specifically to pregnant women with rates as high as 70%
Population in Concern	Pregnant women, elderly, immunocompromised people.
Elimination	The bacteria is eliminated after a few minutes at 71°C or a few seconds at over 160°C. Studies show that after a 25 second exposure to 160°C 99.9 % of the bacteria are eliminated.

Salmonella	
Description	A gram negative bacteria that is very widespread.
Products of Concern	Meats, cheese, eggs, dairy, seafood, sauces and salad dressings
Source of Contamination	All animals, particularly, pork and poultry.
Symptoms	Nausea, vomiting, diarrhoea, fever, headaches.
Other Complications	Typhoid and typhoid like fevers, arthritis, death.
Population in Concern	All population but particularly, elderly and children.
Elimination	The bacteria is eliminated after a few minutes at 71°C or a few seconds at over 160°C. Studies show that after a 10 second exposure to 160°C 99.9 % of the bacteria are eliminated.

Bacillus cereus	
Description	A gram positive aerobic sporeformer.
Products of Concern	Cooked foods that aren't refrigerated
Source of Contamination	Soils and starchy foods such as rice are most common but it can also be present in meats.
Symptoms	Nausea, vomiting, cramps, headaches, muscle aches.
Other Complications	Systemic and pyogenic infections, gangrene, septic meningitis, cellulitis, lung abscesses, infant death.
Population in Concern	All population
Elimination	The bacteria is eliminated after a few minutes at 70°C or a few seconds at over 160°C.

	Shigella
Description	A gram negative bacteria very similar to E.Coli
Products of Concern	Salads, raw vegetables, dairy and poultry.
Source of Contamination	Human digestive system and human feces are the main source of contamination due usually to poor hand hygiene.
Symptoms	Abdominal cramps, diarrhoea, fevers, pain, vomiting
Other Symptoms	Arthritis, and death.
Populations of Concern	All of the population but particularly pregnant women, elderly, and immunocompromised people.
Elimination	The bacteria is eliminated after a few minutes at 70°C or a few seconds at over 160°C.

	Staphylococcus Aureus
Description	A gram positive bacteria.
Products of Concern	Meats, eggs, salads, dairy, sensitively prepared foods.
Source of Contamination	Air, sewage, milk, water, dust, food, food equipment.
Symptoms	Nausea, vomiting, cramps, headaches, muscle cramps.
Other Symptoms	Rare cases of death.
Populations of Concern	All of the population but particularly pregnant women, elderly, and immunocompromised people.
Elimination	The bacteria is eliminated after a few minutes at 70°C or a few seconds at over 160°C.

Campylobacter jejuni	
Description	A gram negative bacteria that is the leading cause of bacteria related diarrhoea
Products of Concern	Poultry, non-pasteurized milk.
Source of Contamination	Cows, birds, flies, water sources.
Symptoms	Diarrhoea
Other Symptoms	Internal organ infections and death (1/5000000)
Populations of Concern	All population but particularly children under 5 and adults between 15 and 29.
Elimination	The bacteria is eliminated after a few minutes at 70°C or a few seconds at over 160°C. Studies show that 94% of the bacteria is killed under 5 seconds at 160°C.

Clostridium Botulinum-Perfringens	
Description	There are 4 strains causing botulism in humans, clostridium is a gram positive anaerobic spore that produces a neurotoxin.
Products of Concern	Meat, improperly canned foods
Source of Contamination	Soil, Intestinal tracts for animals and fish, shellfish and widely spread in the environment.
Symptoms	Abdominal cramps, diarrhoea, lack of energy, weakness, double vision, respiratory problems.
Other Symptoms	Death, paralysis, dehydration.
Populations of Concern	All of the population but particularly children, elderly, and immunocompromised people.
Elimination	The bacteria has a unique resistance to heat, it's resistant to 100°C for hours, but disappears within a couple minutes at 170°C. Regular cleaning reduces the risk by reducing the ability to form on the surface.