

**EPIDEMIOLOGICAL AND CLINICAL FEATURES  
OF IMPORTANT AETIOLOGICAL AGENTS OF FOOD-BORNE ILLNESS**

**FOODBORNE BACTERIA**

Causative Agent	Incubation Period	Mode of Action	Clinical Features	Food Vehicle	Prevention & Control
<i>Staphylococcus aureus</i>	1-6 hrs	Preformed toxin	Abd cramps, N, V	Unrefrigerated or improperly refrigerated meat, dairy products, cream pastries	Proper food handling and storage with proper temperature control. Exclude food handlers with septic wounds.
<i>Bacillus cereus</i>	1-6 hrs or 10 to 16 hours	Preformed toxin or diarrhoeal toxin	N, V Abd cramps, D	Improperly refrigerated cooked or fried rice, meat, vegetables	Thorough and rapid reheating of cooked food
Non-typhoidal <i>Salmonella</i>	12-36 hrs	Infection	D, abd cramps, N, V, F	Meat, poultry, eggs and dairy products	Proper meat processing; adequate cooking; avoid cross-contamination; proper temperature control and storage.
<i>Campylobacter jejuni</i>	2-5 days	Infection	D, abd cramps, N, V, F	Under-cooked meat (particularly poultry) and unpasteurized milk	Wash hands after contact with animal/animal products; thorough cooking and proper

					storage of food of animal origin; pasteurisation of milk.
<i>Clostridium perfringens</i>	6-24 hours	Enterotoxin	D, abd cramps	Beef, poultry, gravies, dried foods	Adequate cooking; proper temperature control; thorough reheating of cooked food
Enterohaemorrhagic <i>E. coli</i> (EHEC) including <i>E.coli</i> O157:H7 or other STEC	3-8 days	Infection	Severe abd cramps, watery to bloody D, hemorrhagic uremic syndrome (HUS)	Ground beef, unpasteurised milk and hamburgers	Proper processing and handling of meat; adequate cooking and storage.
<i>Listeria monocytogenes</i>	9-48 hours for gastrointestinal symptoms, 2-6 weeks for invasive disease	Infection	Mild flu-like illness to meningitis, meningo-encephalitis	Cold processed meat, unpasteurised milk, dairy products, fruits and vegetables	Proper processing and handling; prevent cross-contamination; adequate cooking; pasteurisation of dairy foods.
<i>Clostridium botulinum</i>	12-72 hrs	Preformed toxin	V, constipation, dryness of mouth, change of voice, dysphagia, ptosis, diplopia	Home canned food, improperly canned commercial food	Proper supervision of home canning; adequate heating to 100°C for 10 minutes OR 80° C for 30 minutes.

## FOODBORNE VIRUSES

Incubation Period	Incubation Period	Mode of Action	Clinical Features	Food Vehicle	Prevention & Control
Norovirus	12-48 hrs	Infection	N, V, D, abd cramps, transient F, myalgia	Contaminated food such as oysters and contaminated water supply (person-person transmission can occur)	Provision of safe food and water, proper handling of cold foods, hand-washing
Rotavirus	1-3 days	Infection	V, D, F	Contaminated food (person-person transmission can occur)	Proper handling of food, personal hygiene
Other viruses (astrovirus, adenovirus, sapovirus)	10-70 hrs	infection	N, V, D, abd cramps, malaise, headache, F	Contaminated food, ready-to-eat food touched by infected workers, some shellfish	Good personal hygiene

## FOODBORNE PARASITES

Causative Agent	Incubation Period	Mode of Action	Clinical Features	Food Vehicle	Prevention & Control
<i>Cyclospora</i>	1-14 days	Infection	D, N, V, abd cramps, LOA, LOW	Contaminated food or water	Avoiding food or water that may be contaminated with human stool
<i>Cryptosporidium parvum</i>	2-10 days	Infection	D, abd cramps, F, LOW, V	Water, including recreational water,	Provision of safe water supply, boiling water advised

				contaminated by faeces of livestock (person-person transmission can occur)	for immunodeficient persons
<i>Giardia lamblia</i>	1-2 weeks	Infection	N, V, D, abd cramps, bloatedness, LOW, malabsorption	Contaminated food and water (person-person transmission can occur)	Proper water treatment, good personal hygiene
<i>Entamoeba histolytica</i>	2 days-4 weeks	infection	Bloody D, lower abd cramps	Food contaminated by ill food handler	Good personal hygiene
Abbreviations: N, nausea; V, vomiting; D, diarrhoea; abd, abdominal; LOW, loss of weight; LOA, loss of appetite; F, fever.					