

Food-borne Infections

Agent	Incubation		Symptoms			
	Common	Limits	Vomit	Diarrhea	Abdo pain	Fever
Staphylococcus aureus	2-4 hrs	up 8 hrs	+++	+	±	±
Bacillus cereus, emetic	2-4 hrs	1-6 hrs	+++	+	+	-
Bacillus cereus, enteric	12 hrs	8-16 hrs	±	+++	+++	-
Clostridium botulinum	12-36 hrs	2-72 hrs	mostly neurological			
Clostridium perfringens	10-12 hrs	6-24 hrs	±	+++	++	-
E.coli ETEC	12-48 hrs		±	++	+++	+
E.coli EIEC	12-48 hrs		+	++	++	+
E.coli EHEC	2-3 days		-	++	++	-
Salmonella	18-24 hrs	6-72 hrs	±	++	+++	+
Shigella	1-3 days		±	++bld	++	++
Campylobacter jejuni	3-5 days		±	++bld	+++	+
Vibrio parahemolyticus	12 hrs	2-48 hrs	+	++	++	+
Yersinia enterocolitica	3-5 days		++	++	++	++
Norovirus	16-48 hrs		+++	++	+	±
Viral gastroenteritis	16-48 hrs		+	++	+	±

Agent	Food Commonly Involved	Source of Contamination			
		IH	Cool	Hyg	Eqp
Staph. aureus	Beef, poultry, ham, pastries	+	-	++	-
Bacillus cereus	Cooked Rice	++	+	+	-
Clos. botulinum	Vegetables, fish	+	++	-	-
Clos. perfringens	Beef, poultry				-
Salmonella	Beef, raw milk, poultry, pork, ice cream,	++	+	+	+
E.coli ETEC	Salad, raw veg, cheese, water	++	+	+	+
E.coli EIEC	Salad, raw veg, cheese, water	++	+	+	+
E.coli EHEC	Beef, raw milk, water	++	+	+	+
Shigella	Salad, raw	+	-	+++	-
Campylobacter jejuni	Raw milk, poultry, water	+	+	-	-
Vibrio parahaemolyticus	Shellfish	+	++	-	-
Y enterocolitica	Pork	++	+	+	+
Norwalk		-	-	+++	-
Viral agent		-	-	+++	-

IH=Improper holding, Cool=Inadequate cooling, Hyg=Poor hygiene, Eqp=Contaminated equipment

List of Illnesses Attributed to Food

1. Upper gastro-intestinal tract signs & symptoms, nausea & vomiting; incubation less than 1 hour

- Mushroom: eating unknown varieties of mushrooms.
- Antimony, Cadmium, Copper, Lead: eating from newly purchased utensils, enamel-ware poorly fired, highly acidic food and beverages.
- Tin, Zinc: eating from food stored in zinc or tin containers, high acidic foods.

2. Upper gastro-intestinal tract signs & symptoms, nausea & vomiting; incubation 1 to 6 hours

- Bacillus cereus*: poorly handled food (1).
- Staphylococcus aureus*: poorly handled food (1).
- Nitrite: cured meats, vegetables from field with excessive nitrate administration.
- Shellfish poisoning: mussels, shell, scallops

3. Upper respiratory symptoms; incubation less than 1 hour

- Sodium hydroxide poisoning: inadequate rinsing of dishes with caustic soda
- B hemolytic streptococcal infections: contaminated raw milk or eggs

4. Lower gastro-intestinal signs & symptoms, abdominal cramps & diarrhea; incubation 6-12 hours (up to 72hrs)

- Clostridium perfringens*: poorly handled food (1).
- Campylobacter jejuni*: raw milk or raw meat, poorly cooked milk or meat.
- Cholera: fish, shellfish, poorly handled food (1).
- Vibrio cholera*-like gastro-enteritis: raw fish, shellfish.
- Pathogenic *E.coli*: poorly handled food (1).
- Salmonella*: poultry, meat, egg products, milk and dairy poorly cooked.
- Shigella*: poorly handled food (1).
- Vibrio parahaemolyticus*: fish, shellfish poorly cooked or contamination by sea water.
- Yersinia enterocolitica*: milk poorly pasteurized or cooked.

5. Lower gastrointestinal signs & symptoms, abdominal cramps & diarrhea; incubation >72 hours

- Norwalk agent: Raw shellfish, green vegetables, pastry, poorly handled food (1).
- Viral gastro-enteritis (ECHO, Coxsackie, Reo, Adeno, Rota and Polio viruses): food contaminated by carrier and poorly reheated.
- Amoebic dysentery: raw vegetables and fruits.
- Giardiasis: raw vegetables and fruits.
- Anisakiasis: Raw fish.
- Beef tape worm (teniasis): Poorly cooked beef meat.
- Pork tape worm (teniasis): Poorly cooked pork meat.
- Fish tapeworm (diphyllobothriasis): Raw fish.

6. Neurological symptoms: visual disturbances, confusion, tingling, twitching or paralysis; incubation less than 1 hour

- Mushroom poisoning by ibotenic acid group or muscarinic group.
- Organophosphorous: food accidentally contaminated by pesticide.
- Carbamate: food accidentally contaminated by pesticide.
- Neurologic shellfish poisoning: shellfish from areas with red tides.
- Puffer fish

7. Neurological symptoms: visual disturbances, confusion, tingling, twitching or paralysis, incubation 1 to 6 hours

- Chlorinated hydrocarbons: food accidentally contaminated by pesticide.
- Ciguatera: tropical fish in specific areas

8. Neurological symptoms: visual disturbances, confusion, tingling, twitching or paralysis, incubation 12 to 72 hours

- Botulism: poorly canned low acid food, improperly cured ham and fish, food held at room temperature for long time.

9. Neurological symptoms: visual disturbances, confusion, tingling, twitching or paralysis, incubation > 72 hours

- Mercury: grain treated with mercury, fish from heavily polluted area.

10. Generalized infection: fever, chills, malaise, incubation > 72 hours

- Brucellosis: raw milk and dairy products.
- Listeriosis: raw milk and dairy products.
- Typhoid: poorly handled food (1).
- Vibrio vulnificus* septicemia: raw shellfish.
- Hepatitis A: poorly handled food (1), shellfish from contaminated areas.
- Toxoplasmosis: poorly cooked meat.
- Angiostrongyliasis: raw crab, shrimp, salad with slugs.
- Trichinosis: poorly cooked pork meat.

