



# Food-borne Outbreak Investigation Summary

Revised 7/11/2008

**Table 1: Incubation and symptoms of food poisoning**

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

**Table 2 : Food type and source of contamination**

Agent	Food Commonly Involved	Source of Contamination			
		IH	Cool	Hyg	Eqp
<i>Staph. aureus</i>	Beef, poultry, ham, pastries	+	-	++	-
<i>Bacillus cereus</i>	Cooked Rice	++	+	+	-
<i>Salmonella</i>	Beef, raw milk, poultry, pork, ice cream,	++	+	+	+
<i>E.coli</i> ETEC	Salad, raw veg, cheese, water	++	+	+	+
EIEC	Salad, raw veg, cheese, water	++	+	+	+
EHEC	Beef, raw milk, water	++	+	+	+
<i>Shigella</i>	Salad, raw	+	-	+++	-
<i>Campylobacter jejuni</i>	Raw milk, poultry, water	+	+	-	-
<i>Vibrio parahaemolyticus</i>	Shellfish	+	++	-	-
<i>Y. enterocolitica</i>	Pork	++	+	+	+
<i>Clos. botulinum</i>	Vegetables, fish	+	++	-	-
<i>Clos. perfringens</i>	Beef, poultry				-
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
- $\beta$  hemolytic streptococcal infections: contaminated raw milk or eggs

### **4. Lower gastrointestinal 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.

