Appendix D: NORS/NEARS Guidance for Contributing Factors in Foodborne Outbreak Reports

Introduction

Contributing factors (CFs) are defined as the practices that most likely contributed to a foodborne illness outbreak. The contributing factors identified help to determine what the root cause was for an outbreak in regards to the contamination, proliferation, or survival of microorganisms or toxins in the confirmed or suspected food vehicle. A CF should be cited only if the investigator has strong evidence that it actually occurred in this outbreak, rather than citing factors that have been documented in similar outbreaks or were observed as violations that did not necessarily contribute to this particular outbreak.

After consideration of all epidemiological, laboratory, environmental assessment, and traceback information available, if contributing factors for this outbreak could not be determined, then at the top of the contributing factors section, the box 'Contributing Factors are Unknown' should be checked. If this box is checked, then the remainder of the contributing factors section should be left completely blank.

Please contact NORS-Foodborne@cdc.gov or NEARS@cdc.gov for questions on determining the contributing factors for an outbreak.

Classification

CFs are classified into 3 categories:

Contamination Factors

- Factors that introduce or otherwise permit contamination.
- Contamination factors refer to how the etiologic agent got onto or into the food vehicle.
- There are 13 contamination factors, numbered C1–C13.
- Contamination factors can be applicable to all etiologies.
- C-Unknown is utilized if contamination factors could not be determined.
- C-N/A is utilized if contamination factors were not related to the type of etiologic agent involved in the outbreak. C-N/A should rarely, if ever, be cited.

Proliferation Factors

- Factors that allow growth of etiologic agents.
- Proliferation factors refer to how bacterial agents were able to increase in numbers and/or produce toxic products before the vehicle was ingested.
- There are 11 proliferation factors, numbered P1–P11.
- Citation of proliferation factors is only applicable in bacterial or fungal outbreaks.
- P-Unknown is utilized if proliferation factors could not be determined.
- P-N/A is utilized if proliferation factors are not related to the type of etiologic agent involved in the outbreak. For example, proliferation factors would not be cited in a viral outbreak.

Survival Factors

- Factors that allow the contaminant to remain above an infectious dose or fail to inactivate the contaminant.
- Survival factors refer to processes or steps that should have eliminated or reduced the pathogen below an infectious dose but did not because of one of these factors.
- There are 6 survival factors, numbered S1–S6.
- Citation of survival factors is only applicable in bacterial, viral, parasitic, or fungal outbreaks.
- S-Unknown is utilized if survival factors could not be determined.
- S-N/A is utilized if survival factors were not related to the type of etiologic agent involved in the outbreak. For example, survival factors would not be cited in a scombroid toxin outbreak.

Identification of Contributing Factors in an Outbreak

In a foodborne outbreak, an environmental assessment is a systematic process designed to gather as much information as possible to describe the environmental circumstances before the exposure(s) that caused a foodborne outbreak. From this evaluation process, factors that most likely contributed to the outbreak may be identified. Each environmental assessment will be unique to a specific outbreak.

It should include some or all of the following:

- A visit to the location where suspected food vehicles are grown, harvested, processed, prepared and/or served;
- A review and observation of the physical facilities, the equipment and the food handling processes used;
- Interviews with those involved in the harvest, processing, handling and/or preparation of the implicated foods;
- A review of the menus in food-service establishments such as restaurants, delis, quick service restaurants, or institutional food service facilities including schools, nursing homes, and hospitals;
- Development of a food flow diagram for implicated foods that includes notes on preparation policies and practices, points of possible contamination and individuals involved, and/or;
- Reenactment of the preparation of foods involved in the outbreak.

Note:

Identification of contributing factors should be based on an environmental assessment of the outbreak, *not* results of *routine* inspections. For example, during an outbreak investigation, improper cooling or food handler violations may be observed. These risky practices or behaviors may or may not be relevant to the outbreak, and should only be reported if it was determined they were associated with the outbreak. Contributing factors cited should fit within the context of epidemiological, laboratory, and environmental findings for the outbreak. Formal traceback investigations may support or confirm the identification of contributing factors.

Point of Contamination

Contamination factors should be cited as they relate specifically to the confirmed or suspected point of contamination, including:

- Before point of final preparation/sale:
    - Pre-harvest: farm or dairy, harvest area, growing field, etc.
    - Post-harvest: processing plant, pasteurization plant, distribution facility, storage/warehouse facility, during transit, etc.
    - Unknown if pre- or post-harvest
- Point of final preparation/sale: restaurant, grocery store, private home/residence, etc.
- Unknown point of contamination
- Not applicable (N/A)

Reporting Contributing Factors

Please select any and all CFs that are *causally* associated with the outbreak based on the laboratory, epidemiologic and environmental evidence identified during the foodborne outbreak investigation.

Contributing Factors Unknown: After consideration of all epidemiological, laboratory, environmental assessment, and traceback information available, if contributing factors for this outbreak could not be determined, then at the top of the contributing factors section, select 'Contributing Factors are Unknown'. If this box is checked, then the remainder of the contributing factors section should be left completely blank.

Contamination Factors

Factors that introduce or otherwise permit contamination; contamination factors relate to how the etiologic agent got onto or into the food vehicle.

C-Unknown: contamination factors could not be determined
C-N/A: contamination factors are not related to the type of etiologic agent involved (this should rarely, if ever, be cited)

C1: Toxin or chemical agent naturally part of tissue in food vehicle

Description
A natural toxin found in a plant or animal, or in some parts of a plant, animal, or fungus;
-OR-
A chemical agent of biologic origin that occurs naturally in the vehicle or bioaccumulates in the vehicle before or soon after harvest.

Examples

- Ciguatera fish poisoning due to consumption of tropical marine finfish which have bioaccumulated naturally-occurring ciguatera toxins through their diet
- Scombroid fish poisoning due to consumption of fish containing elevated levels of histamine
  (However, if there is environmental or traceback evidence of temperature abuse, then please also identify P4 or P5 (as appropriate) in addition to C1.)
- Mushroom poisoning due to consumption of toxic mushrooms

Notable Exceptions
None.

C2: Poisonous substance or infectious agent intentionally added to food vehicle to cause illness (does not include injury)

Description
A poisonous substance, chemical agent, or infectious agent was intentionally/deliberately added to the food vehicle in quantities sufficient to cause serious illness. Poisons added because of sabotage, mischievous acts, and attempts to cause panic or to blackmail a company fall into this category. This contributing factor does not apply to physical items intentionally added to cause injury.

Examples

- Cyanide or phenolphthalein deliberately added to food to cause illness
- Methomyl pesticide intentionally added to food to cause illness
- *Salmonella* intentionally added to food to cause illness

Notable Exceptions
None.

C3: Poisonous substance accidentally/inadvertently added to food vehicle

Description

A poisonous substance or chemical agent was accidentally/inadvertently added to the food vehicle. This addition typically occurs at the time of preparation or packaging of the vehicle. Misreading labels, resulting in either mistaking poisonous substances for foods or incorporating them into food mixtures, would also fall into this category.

Examples

- Sanitizer or cleaning compound accidentally added to food
- Metallic ingredient accidentally added to food (e.g., copper in cake icing)

Notable Exceptions

This does not apply to infectious agents.

C4: Ingredients toxic in large amounts accidentally added to food vehicle

Description

An approved ingredient can be accidentally added in excessive quantities to the food vehicle so as to make the food unacceptable for consumption.

Examples

- Excessive amount of niacin in bread
- Excessive amount of nitrites in cured meat
- Excessive amount of ginger powder in gingersnaps

Notable Exceptions

None.

C5: Container or equipment used to hold or convey food vehicle was made with toxic substances

Description

The container that held or conveyed the implicated food is made of toxic substances. The toxic substance either migrates into the food or leaches into solution by contact with highly acidic foods.

Examples

- Galvanized container used to store acidic food/beverage
- Flour stored in a container that previously held toxic materials
- Pre-made ice stored in a toxic container

Notable Exceptions

This factor should not be confused with contamination resulting in a waterborne outbreak, rather than foodborne. Waterborne outbreaks generally include contamination occurring in the source water or in the treatment or distribution of water to the end consumer. For example, in drink mix/soda machines, if the water enters a contaminated machine or if there is a problem with the internal plumbing of the machine resulting in contamination (e.g., cross-connections, backflow of carbonated water resulting in copper leaching), this is a waterborne outbreak. For ice, if ice is made with contaminated water, it is also a waterborne outbreak. However, if ice is already made and then it becomes contaminated because it was previously stored in a container made with toxic substances, it is a foodborne outbreak and it would be appropriate to list C5 as a contributing factor.

C6: Food vehicle contaminated by animal or environmental sources <u>at point of final preparation/sale</u>

Description

The food or ingredient was contaminated at <u>point of final preparation/sale</u> (e.g., restaurant, private home, etc.) by animal or environmental sources, such as from dripping, flooding, airborne contamination, access of insects or rodents, and other situations conducive to contamination.

Examples

- Mouse feces in pantry contaminates food
- A leaky roof permits water to seep into a walk-in refrigerator and contaminates stored food

Notable Exceptions

None.

C7: Food vehicle contaminated by animal or environmental sources before arriving at point of final preparation (pre or post-harvest)

Description

The food or ingredient was contaminated before arriving at the point of final preparation by animal or environmental sources, either pre-harvest (e.g., growing field, harvest area, irrigation water, etc.) or post-harvest (e.g., processing or distribution facility, in warehouse storage, during transit, etc.).

Note: Formal traceback may support or confirm the identification of where the food vehicle was contaminated (pre-harvest versus post-harvest). If identified, please indicate this in the Point of Contamination question on the NORS form; otherwise, please select "before point of final/preparation/sale: unknown".

Examples

Pre-Harvest:

- Shellfish from sewage polluted waters or closed beds
- Crops watered by contaminated irrigation water
- Produce grown in soil contaminated by geese
- Live poultry contaminated with *Campylobacter*
- Eggs contaminated with *Salmonella*

Post-Harvest:

- Peanut butter contaminated by bird droppings in a processing plant
- Cheese contaminated with *Listeria* in a cheese manufacturer plant

Notable Exceptions

None.

C8: Cross-contamination of ingredients, excluding infectious food workers/handlers

Description

The pathogen was transferred to the vehicle via contaminated surfaces, foods, and/or fomites to include, but not limited to, worker's hands, cutting boards, preparation tables, utensils, processing lines, etc.

Examples

- A ready-to-eat (RTE) food was prepared on the same cutting board as contaminated raw poultry
- A food worker handled contaminated raw foods without subsequently washing their hands, and afterward handled a RTE food
- Materials used to clean equipment (e.g., cloths, sponges, etc.) that processed contaminated raw foods is subsequently used on surfaces that come in contact with RTE foods without first being disinfected
- Contaminated raw foods touch or drip onto foods that are not subsequently cooked
- Contaminated raw foods processed on shared lines with non-contaminated food items

Notable Exceptions

This contributing factor only applies to foods that are cross-contaminated by other food or ingredients, and *not* by an infectious food worker/handler.

C9: Contamination from infectious food worker/handler through bare hand contact with food

Description

A food worker, who is suspected to be infectious, uses their bare hands to touch/prepare foods that are not subsequently cooked. If it is unknown whether the food worker was wearing gloves or not, then cite C11. If there is evidence for both bare hand contact and glove-hand contact with the food, both C9 and C10 should be cited.

This is a typical situation that precedes outbreaks caused by norovirus or staphylococcal enterotoxins.

Potential reasons to suspect that a food worker is "infectious"—an all-inclusive term used to describe all persons who are colonized by, infected with, a carrier of, or ill due to a pathogen:

a) They recently display or admit a combination of common foodborne disease symptoms (e.g., diarrhea, vomiting, nausea, fever, etc.) that may be similar to symptoms identified in those who are ill in the outbreak investigation
b) Their household member exhibits similar symptoms directly preceding the outbreak
c) They tested positive for a foodborne pathogen

d) Other epidemiologically or environmentally linked reasons.

Example

- An infectious food worker/handler preparing deli meat without wearing gloves, thereafter contaminating the food served to restaurant patrons

Notable Exceptions

None.

C10: Contamination from infectious food worker/handler through glove-hand contact with food

Description

A food worker, who is suspected to be infectious, uses their glove-hands to touch/prepare foods that are not subsequently cooked. If it is unknown whether the food worker was wearing gloves or not, then cite C11. If there is evidence for both bare hand contact and glove-hand contact with the food, both C9 and C10 should be cited.

This is a typical situation that precedes outbreaks caused by norovirus or staphylococcal enterotoxins.

See C9 for a further description of reasons to suspect an infectious food worker/handler.

Example

- An infectious food worker/handler preparing deli meat while wearing gloves that have not been changed after coughing into their hand, thereafter contaminating the food served to restaurant patrons

Notable Exceptions

None.

C11: Contamination from infectious food worker/handler through unknown type of hand contact with food or indirect contact with food

Description

A food worker, who is suspected to be infectious, uses their hands to touch/prepare foods that are not subsequently cooked, but the epidemiological/environmental investigation is unable to determine whether or not the food worker was wearing gloves during food preparation.

-OR-

A food worker, who is suspected to be infectious, contaminates the food indirectly (no direct bare-hand or glove-hand contact with the food).

This is a typical situation that precedes outbreaks caused by norovirus or staphylococcal enterotoxins.

See C9 for a further description of reasons to suspect an infectious food worker/handler.

Examples

- An infectious food worker/handler preparing deli meat, though it is unknown if gloves were worn, but thereafter contaminated the food served to restaurant patrons
- An infectious food worker/handler contaminates utensils that thereafter contaminate food served to restaurant patrons.

Notable Exceptions

None.

C12: Contamination from infectious non-food worker/handler through direct or indirect contact with food

Description

A person other than a food handler/worker who is suspected to be infectious, contaminates ready-to-eat foods that are later consumed by other persons, resulting in spread of the illness. A “non-food handler/worker” is considered to be any person who is not directly involved in the handling or preparation of the food before service.

Potential reasons to suspect that a non-food worker is “infectious”—an all-inclusive term used to describe all persons who are colonized by, infected with, a carrier of, or ill due to a pathogen:

a) They recently display or admit a combination of common foodborne disease symptoms (e.g., diarrhea, vomiting, nausea, fever, etc.) that may be similar to symptoms identified in those who are ill in the outbreak investigation
b) Their household member exhibits similar symptoms directly preceding the outbreak

c) They tested positive for a foodborne pathogen
d) Other epidemiologically or environmentally linked reasons.

Examples

- An ill person attends an event and contaminates ready-to eat-foods in a buffet line by handling food before someone else consumes it.
- Pizza is prepared by a healthy food worker and arrives pathogen-free. An ill non-food worker, such as a mother, rearranges pizza slices onto plates before serving the slices to a group of children at a birthday party and these children subsequently develop foodborne illness.
- An infectious non-food worker/handler contaminates utensils that thereafter contaminate food at a potluck.

Notable Exceptions

This factor should not be confused with contamination from person-to-person, rather than foodborne.

C13: Other source of contamination (specify)

Description

A form of contamination that does not fit into the above categories; the factor should be specified in the 'Contributing Factors Comments' section.

Proliferation Factors (bacterial and fungal outbreaks only)

Factors that allow proliferation of the etiologic agents; proliferation factors relate to how the pathogen was able to increase in numbers and/or produce toxic products before the vehicle was ingested.

P-Unknown: proliferation factors could not be determined
P-N/A: proliferation factors are not related to the type of etiologic agent involved (this should be selected for all viral, parasitic, and chemical and toxin outbreaks)

P1: Allowing foods to remain out of temperature control for a prolonged period of time during preparation

Description
During food preparation, food was kept out of temperature control for a prolonged period of time that allowed pathogenic bacteria and/or molds to multiply and generate to populations sufficient to cause illness or to produce toxins if toxigenic.

Examples
- Improper thawing (such as allowing frozen food to thaw at room temperature or leaving frozen foods in standing water for prolonged periods) allows pathogens to multiply and generate
- Prolonged preparation time (such as prolonging preparation time by preparing too many foods at the same time) allows pathogens to multiply and generate

Notable Exceptions
None.

P2: Allowing foods to remain out of temperature control for a prolonged period of time during food service or display

Description
During food service or display, food was kept out of temperature control for a prolonged period of time that allowed pathogenic bacteria and/or molds to multiply and generate to populations sufficient to cause illness or to produce toxins if toxigenic.

Examples
- Leaving foods out at ambient temperature for a prolonged time at a church supper
- No time or temperature control on a buffet line

Notable Exceptions
None.

P3: Inadequate cold holding temperature due to malfunctioning refrigeration equipment

Description
Malfunctioning refrigeration equipment causes foods to be held at an inadequate cold holding temperature.

Examples
- Walk-in cooler malfunctions causing inadequate cold holding temperature of food
- A broken or torn door gasket causes air leakage in a reach-in refrigerator resulting in inadequate cold holding temperature of food

Notable Exceptions
None.

P4: Inadequate cold holding temperature due to an improper practice

Description
Inadequate cold holding temperature occurs due to an improper practice.

Examples
- Overloaded refrigerator resulting in poor air circulation
- Inadequately iced salad bar
- Time/Temperature Control for Safety (TCS) foods, such as tuna or egg salad, are stacked above the fill line of the cold holding wells in a deli cold holding unit

Notable Exceptions
None.

P5: Inadequate hot holding temperature due to malfunctioning equipment

Description
Malfunctioning hot-holding equipment causes foods to be held at an inadequate hot holding temperature.
Examples
- A steam table or crockpot breaks and causes food to be held at inadequate hot holding temperatures

Notable Exceptions
None.

P6: Inadequate hot holding temperature due to an improper practice

Description
Inadequate hot holding temperature occurs due to an improper practice.
Examples
- A steam table or crockpot is not turned on or properly maintained and causes food to be held at inadequate hot holding temperatures
- A crockpot being used to heat or reheat food is overloaded and causes food to be held at inadequate hot holding temperatures

Notable Exceptions
None.

P7: Improper cooling of food vehicle

Description
Foods are refrigerated in large quantities or stored in devices where the temperature is poorly controlled allowing pathogens to multiply.
Examples
- Foods are refrigerated in large masses or as large volumes of foods in containers, which does not allow proper cooling
- Foods are stored in containers with tight-fitting lids, pans are stacked on top of others, or crowded storage in a refrigerator, all of which leads to inadequate air circulation and thus improper/slow cooling

Notable Exceptions
None.

P8: Extended refrigeration of food vehicle for an unsafe amount of time, relative to the food product and pathogen

Description
This situation is a concern for psychrotrophic pathogenic bacteria (e.g., *Listeria monocytogenes*, *Clostridium botulinum* type E, *Yersinia enterocolitica*, *Aeromonas hydrophila*) that multiply over sufficient time at ordinary refrigerator temperatures and generate to populations sufficient to cause illness or elaborate toxins if toxigenic (e.g., *C. botulinum*).
Examples
- *Listeria* growth after refrigeration of deli meat for more than 7 days
- Holding open containers of commercially prepared foods for several weeks

Notable Exceptions
None.

P9: Inadequate Reduced Oxygen Packaging (ROP) of food vehicle

Description
Food was sealed using Reduced Oxygen Packaging (ROP) methods, providing conditions conducive to growth of anaerobic or facultative bacteria in foods. ROP includes processing and packaging techniques that prevent the entry of oxygen into the container, such as vacuum packaging, modified or controlled atmosphere packaging, cook chill

packaging, sous vide packaging, hermetically sealed containers (double seams/glass jar with lid), deep containers from which air is expressed, and products packed in oil.

Examples

- Vacuum-packed fish
- Salad in gas-flushed bag
- Hermetically sealed can
- Garlic packaged in oil
- Controlled atmosphere packaging of beef jerky

Notable Exceptions

None.

P10: Inadequate non-temperature dependent processes (e.g., acidification, water activity, fermentation) applied to a food vehicle to prevent pathogens from multiplying

Description

Non-temperature-dependent processes (e.g., acidification, water activity, fermentation) failed and allowed pathogens to multiply and generate to populations sufficient to cause illness. This situation is a concern for growth of preformed heat-stable toxins or bacterial spores (e.g., *Clostridium perfringens, Clostridium botulinum, Bacillus cereus, Staphylococcus aureus)*.

Examples

- Insufficient acidification (low concentration of acidic ingredients) in home canned foods
- Insufficiently low water activity (low concentration of salt) in smoked/salted fish
- Inadequate fermentation (starter culture failure or improper fermentation conditions) in processed meat or processed cheese

Notable Exceptions

Outbreaks caused by pathogenic bacteria, including *E. coli*, *Listeria monocytogenes*, and *Salmonella* species do not usually *grow* in high-acid food, but may be able to *survive* for extended periods of time. In these cases, please cite S4.

P11: Other situations that promoted or allowed microbial growth or toxic production (specify)

Description

A factor that promotes growth, proliferation, amplification, or concentration of bacterial agents but that does not fit into any of the other defined categories; the factor should be specified in the 'Contributing Factors Comments' section.

Survival Factors (bacterial, viral, parasitic, or fungal outbreaks only)

Factors that allow survival or fail to inactivate the contaminant; survival factors refer to processes or steps that should have killed or reduced the pathogen below an infectious dose but did not because of one of these factors.

S-Unknown: survival factors could not be determined
S-N/A: survival factors are not related to the type of etiologic agent involved (this should be selected for all chemical or toxin outbreaks)

S1: Inadequate time and temperature control during initial cooking/thermal processing of food vehicle

Description

The time and temperature during initial cooking/thermal processing (e.g., pasteurizing, blanching, drying, dry roasting, frying, infrared, microwave, oil roasting, steaming) was inadequate to kill or reduce the pathogen below an infectious dose. In reference to cooking, but not retorting, it refers to the destruction of vegetative forms of bacteria, viruses, and parasites, but not bacterial spores. If the food under investigation was retorted, then spore-forming bacteria would be included.

Examples

- Inadequate cooking of meats/poultry before service
- Inadequate pasteurization of milk

Notable Exceptions

- Citation of S1 does not include inactivation of preformed heat-stable toxins or destruction of bacterial spores, such as *Clostridium botulinum*, unless the food vehicle underwent a retort process. If this process was determined to be inadequate to kill the pathogen, please cite S1. Otherwise, please cite the appropriate proliferation factor.
- Norovirus in food cannot be inactivated by moderate heat treatments, such as pasteurization. However, it can be effectively inactivated with cooking or other heat processes, such as roasting.

S2: Inadequate time and temperature during reheating of food vehicle

Description

The time and temperature during reheating or heat processing of a previously cooked food (which has often been cooled overnight) was inadequate to kill or reduce the pathogen below an infectious dose.

Examples

- Reheating of sauces or roasts to a temperature insufficient to reduce the level of contamination to below an infectious dose

Notable Exceptions

Citation of S2 does not include inactivation of preformed heat-stable toxins, such as *Clostridium perfringens*. Please cite the appropriate proliferation factor instead.

S3: Inadequate time and temperature control during freezing of food vehicle designed for pathogen destruction

Description

The time and temperature during freezing was inadequate to kill or reduce the pathogen below an infectious dose. A freezing process may be used in order to ensure the destruction of certain parasites before raw service of some foods, such as fish.

Examples

- Pacific red snapper was not sufficiently frozen before service in raw sushi, or an investigation revealed that the time and temperature required to kill parasites was not utilized.

Notable Exceptions

- Some species of tuna do not harbor parasites of concern and thus freezing is not necessary. Care should be taken in determining if freezing would have been an appropriate pathogen destruction process for the fish in question before this factor is cited.
- Norovirus in food cannot be inactivated by freezing.

S4: Inadequate non-temperature dependent processes (e.g., acidification, water activity, fermentation) applied to a food vehicle for pathogen destruction

Description

Non-temperature depending processes (e.g., acidification, water activity, fermentation) designed to kill or reduce the pathogen below an infectious dose were inadequate or improperly used, allowing pathogens to survive. This situation is more of a concern for pathogenic bacteria due to their low infectious doses, making survival more often the cause for illness rather than proliferation.

Please note:

1) Though chemicals may be added to foods to inhibit bacterial growth, at normal levels of use, most chemicals cause inhibition rather inactivation.
2) Though pH is considered primarily a means of growth inhibition and not a method of destruction of existing pathogens, at low pH values, many bacterial pathogens will be destroyed if held at that pH for a significant amount of time, even if their growth is already inhibited. If the acidification procedures are inadequate, pathogenic bacteria can survive. *E. coli* O157:H7 and *Listeria monocytogenes,* in particular, are able to survive acidic conditions.

Examples

- Inadequate acidification of seafood when preparing ceviche, where the pH allowed pathogen survival
- Inadequate acidification of unpasteurized juice, where the pH allowed survival of *E. coli*
- Inadequate salting of fresh water fish, allowing for parasite survival
- Inadequate fermentation of sauerkraut, allowing for survival of *Listeria monocytogenes*
- Inadequate chlorine concentration used for washing lettuce, allowing for survival of *E. coli*.

Notable Exceptions

Norovirus in food cannot be inactivated by acidification.

S5: No attempt was made to inactivate the contaminant through initial cooking/thermal processing, freezing, or chemical processes

Description

No attempt was made to inactivate the contaminant through initial cooking/thermal processing, freezing, or chemical processes.

Examples

- Unpasteurized milk or cider
- Oysters served raw

Notable Exceptions

None.

S6: Other process failures that permit pathogen survival (specify)

Description

A form of survival that does not fit into the above categories; the factor should be specified in the ‘Contributing Factors Comments’ section.