Cryptosporidium

Protecting Your Food Business

This leaflet provides information for food business operators in the event of a boil water notice for *Cryptosporidium*.

Food Safety
AUTHORITY OF IRELAND

Disclaimer

This leaflet is for information purposes only. The Food Safety Authority of Ireland does not endorse or recommend any particular water treatment system brand or model. It is the responsibility of the food businesses operator to consult with the manufacturer on the system's specifications and to follow the manufacturer's instructions for its installation and maintenance.

What is *Cryptosporidium?*

Cryptosporidium is a parasite which causes cryptosporidiosis — a common form of gastroenteritis, particularly in young children. The disease in humans is commonly caused by the species *C. hominis* and *C. parvum*. Watery diarrhoea is the most common symptom of cryptosporidiosis, but symptoms can be severe in people with weakened immune systems. Symptoms appear two to ten days after a person becomes infected and usually persist for about two weeks.

How is *Cryptosporidium* spread?

Drinking water contaminated with *Cryptosporidium* has caused large outbreaks of cryptosporidiosis. However, *Cryptosporidium* can also be spread by eating contaminated food, person-to-person contact, e.g. changing nappies, contact with infected animals, or by swallowing contaminated recreational water.

When humans or animals are infected with *Cryptosporidium*, they can pass large numbers of oocytes (*Cryptosporidium* encased in protective outer shells) in their faeces. Oocytes cannot multiply outside the body, but they can survive in the environment and may make their way into the drinking water system, from which they are difficult to remove.

Drinking water treatments

Water treatment plants use multiple steps, such as filtration, coagulation and chlorination, to turn source water into drinking water. While oocytes are resistant to chlorination, they can be removed from the water using filters. However, if the source water is contaminated and the water treatment plant is not working effectively, or is overwhelmed, e.g. during heavy rainfall, sufficient oocytes to cause illness may pass through into the drinking water.

Food business operators' responsibilities

General food law places primary responsibility to produce safe food on the food business operator. The definition of food includes any substance, including water, intentionally incorporated into the food during its manufacture, preparation or treatment. As contaminated water or ice can cause a food hazard (if used as an ingredient, a processing aid, a coolant, or for washing and rinsing food and food contact surfaces), food business operators are responsible for ensuring the safety and quality of the drinking water used in their operations. Standards produced by the National Standards Authority of Ireland (NSAI) contain information on requirements and good practice for drinking water safety.

Traceability

Under Regulation EC (No) 178/2002, which is transposed into Irish law by S.I. No. 747 of 2007, food business operators must be able to trace all food, ingredients and any other substance expected to be incorporated into a food during all stages of production, processing and distribution. In terms of water, this means that the food business operator must know where their water supply comes from, and what products it is used for or in. When a problem with the water supply arises, the benefits and importance of a good traceability system become apparent.

Monitoring of Drinking Water Supplies

Most food businesses are on public drinking water supplies (supplied by local authorities) and can access data on the quality of these public water supplies from their local authority and the Environmental Protection Agency (EPA). However, while food businesses which are on public drinking water supplies may be able to get general data on the microbiological quality of the supply, these are not absolute guides to the presence or absence of *Cryptosporidium*. Routine testing of drinking water supplies does not include *Cryptosporidium*.

Each year, the EPA produces a report on the quality of drinking water in Ireland. However, food businesses operators who take their drinking water from private group water schemes or private wells are directly responsible for the water they use. They should ensure the water meets all regulatory requirements and is appropriately treated if required. Regular testing is strongly recommended. The basic standards governing the quality of drinking water are set out in EU Directive 98/83/EC, which is transposed into Irish law as S.I. No. 278 of 2007. The EPA or local authority can provide further advice on monitoring drinking water supplies.

The EPA has produced a risk screening methodology to assist local authorities in prioritising supplies that are at a high risk of contamination with *Cryptosporidium* and to identify high risk factors, which can be mitigated to reduce the risk associated with the supply.

The EPA intends to report on an annual basis as part of the annual report on drinking water quality, on the progress made in relation to reducing the risk of contamination with *Cryptosporidium*.

HACCP

Food businesses are legally obliged to put in place, implement and maintain a permanent procedure or procedures based on the HACCP (Hazard Analysis and Critical Control Point) principles. HACCP provides businesses with a cost effective system for control of food safety from ingredients through production, storage and distribution to sale and service of the final consumer. The preventive approach of HACCP not only improves food safety management, but also complements other quality management systems. More information on HACCP is available from the Food Safety Authority of Ireland's (FSAI) website (www.fsai.ie).

Boil Water Notices

If a drinking water supply is contaminated, or suspected of being contaminated, with a microorganism such as *Cryptosporidium*, a 'Boil Water Notice' may be issued by the water supplier. Boil water notices generally inform users of a water supply that water must be boiled before using for:

- drinking and preparing drinks made with water
- preparing foods that will not be cooked before eating
- brushing teeth
- making ice.

Boil Water Notices— Implications for Food Businesses

As food businesses use large volumes of drinking water, boil water notices can have serious practical implications on their operations. During a boil water notice for *Cryptosporidium*, food business operators should consider the points below. Note: Boil water notices issued for reasons other than *Cryptosporidium* may require a different approach.

1. When did the water contamination occur?

Food business operators must determine when the water contamination was likely to have occurred so that they can identify and take appropriate action on foods which have been prepared using potentially contaminated water. Contact the water supplier for more information — contact details will be available from the boil water notice posted in the press.

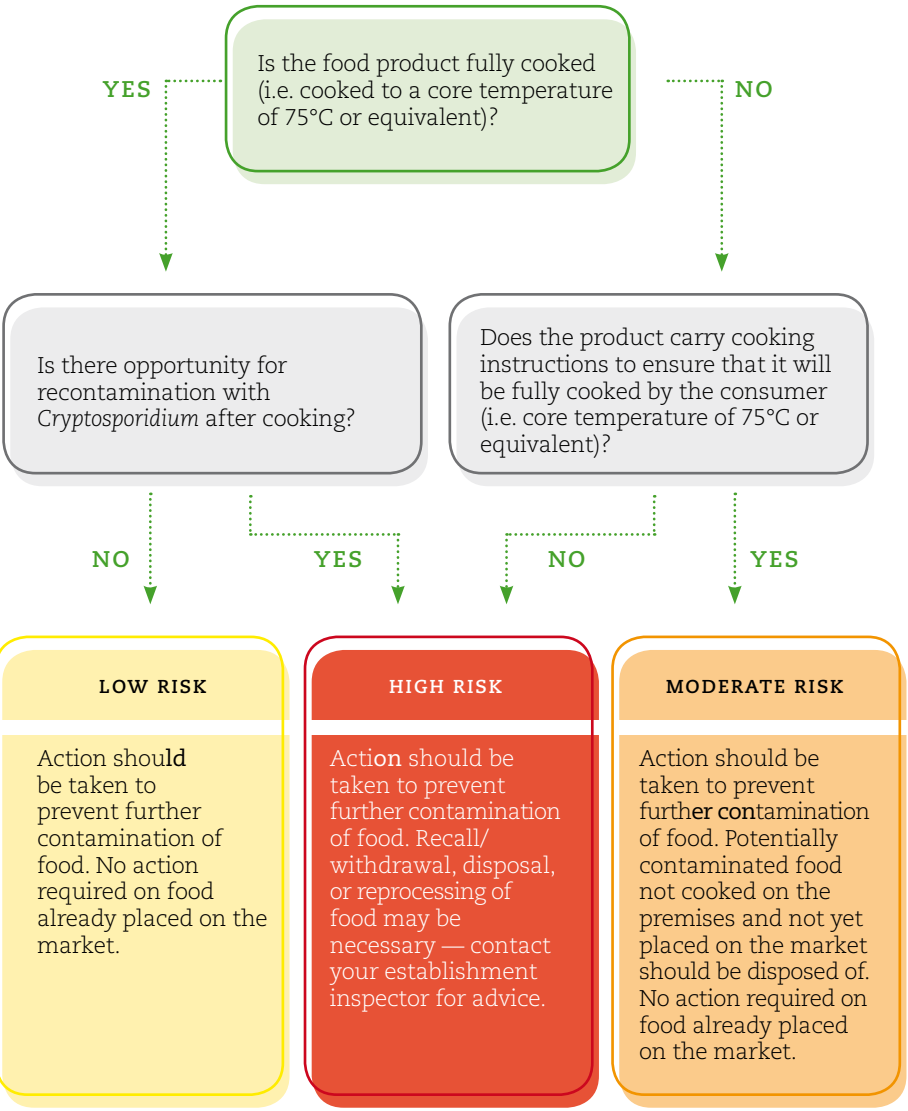
2. Has any food been contaminated?

Food business operators must identify any food (including ice and drinks) that has been prepared with potentially contaminated water, so that it can be disposed of, reprocessed or withdrawn/recalled. As this may be a complex task, food businesses should prepare water distribution plans to track the use and distribution of water in the business in advance of any incident, and discuss with their establishment inspector, e.g. environmental health officer.

Foods cooked to achieve a core temperature of 75°C, instantaneously (or equivalent, e.g. 70°C for two minutes) will not be a risk as this temperature will destroy *Cryptosporidium* oocytes — see flow diagram on the next page.

Assessment of Relative *Cryptosporidium* Risk to Products where Water is Used as an Ingredient during a Boil Water Notice

(Adapted from documents 1 & 2 under 'Further Reading')



3. When must boiled water be used?

Food business operators must identify processes in their operation for which the water must first be boiled or otherwise treated to remove or inactivate *Cryptosporidium*. These include water for:

- drinking and preparing drinks made with water
- making ice
- preparing food which will not be cooked before eating, e.g. salads and fruit.

Boiled water can be stored in the fridge in a clean, covered container for up to 48 hours.

Disconnect ice machines, fizzy drink dispensers and water fountains that are connected to the contaminated water supply. Discard ice cubes in fridges, freezers and ice machines - prepare fresh ice using boiled water.

4. When is boiled water not required?

As oocytes are destroyed by heat and desiccation, boiled water is generally not required for the following:

- preparing food (including tea and coffee machines) that will be cooked to a core temperature of 75°C (or equivalent)
- hand-washing (use soap and warm water and dry well)
- cleaning and rinsing food preparation surfaces (make sure surfaces are well dried)
- dish-washing (use water that has been heated to at least 70°C and cooled, or in a dishwasher which heats to 70°C).

5. Are staff fully aware of their responsibilities?

Remind staff of the importance of complying with the boil water notice, of practicing good personal hygiene, and of their responsibility to produce safe food. Further training and/or supervision may be required.

Staff must immediately report illness and symptoms such as diarrhoea or vomiting to their supervisor, and must not carry out food handling duties until 48 hours after symptoms have stopped and stools have returned to normal. Food workers with diarrhoea should see their doctor and ask that a stool sample be submitted for

investigation. The NSAI guidelines outline general personal hygiene and health requirements for staff.

6. Do you need to inform the competent authorities?

Inform the competent authority if any potentially contaminated food product has made its way into the food chain. Contact your establishment inspector, or the FSAI for further advice.

7. Alternative water treatment options?

Boiling water ensures that *Cryptosporidium*, that may be present in the drinking water, is killed. However, this may not be practical for large food operations and other treatment methods, such as filtration and ultraviolet radiation (UV), may be considered.

Food business operators must check the manufacturer's specifications to ensure that a proposed water treatment system is fit for purpose and effective in removing *Cryptosporidium* oocytes. In order to work effectively, systems must be properly fitted, maintained and serviced according to the manufacturer's instructions. Contact your establishment inspector for more advice on water treatment options.

Filtration: Mains water can be treated at point of use by an appropriate filtration system. Filtration systems with an absolute pore size of 1 micron (µm) or less should be used as oocytes tend to be between 2-6 µm in size. Ultra filtration or reverse osmosis systems will also remove oocytes. Domestic jug filters are not effective at removing oocytes.

UV: Usually used in combination with filtration, UV wavelengths of 200-400 nanometers can inactivate oocytes.

Where food businesses buy ice or water from external sources for use during a boil water notice they should ensure the reliability of the source, its packaging, transport and storage after delivery.

Where food businesses have their own private water source with/or without water treatment they should consult with their local authority when a boil water notice is issued.

After Boil Water Notices Have Been Lifted

Boil water notices are only lifted when certain criteria, set by the Health Service Executive (HSE) and the EPA, have been met. When a notice is lifted, food businesses in the area will be contacted individually with specific advice by the HSE Department of Environmental Health (and/or other food regulatory agencies depending on the type of food business). Generally, food businesses will be advised to clean and disinfect all water-using fixtures and equipment, e.g. ice and drinks machines, and to rinse well before re-using.

Where to Go for More Advice

- Your food establishment inspector, e.g. environmental health officer, veterinary inspector.
- Food Safety Authority of Ireland (*www.fsai.ie*).
- Incident Response Team — contact details will be available from the boil water notice posted in the press.
- Environmental Protection Agency (*www.epa.ie*).
- The relevant local authority or group water scheme.
- Health Protection Surveillance Centre (www.hpsc.ie).

Further Reading

1. **Campden & Chorleywood Food Research Association Group (2000)** Water Quality for the Food Industry: Management and Microbiological Issues. Guideline No. 27. Available to order from: *www.campden.co.uk*
2. **Chilled Food Association (2005)** Water Quality Management Guidance. Second edition. Available to order from: www.chilledfood.org
3. **National Standards Authority of Ireland (2007)** Hygiene in the Catering Sector (I.S. 340:2007). Available to order from: www.nsai.ie
4. **National Standards Authority of Ireland (2007)** Hygiene in Food Retailing and Wholesaling (I.S. 341: 2007)
5. **National Standards Authority of Ireland (2002)** Hygiene for Domestic Scale Food Production (I.S. 344: 2002)
6. **National Standards Authority of Ireland (1997)** Guide to Good Hygiene Practice for the Food Processing Industry in Accordance with the Council Directive 93/43/EEC on the Hygiene of Foodstuffs (I.S. 342: 1997)
7. **National Standards Authority of Ireland (1990)** Code of practice for Hygiene in the Food and Drink Manufacturing Industry (I.S. 3219: 1990)
8. **Food Safety Authority of Ireland (2006)** Safety of Potable Water in Ireland. Available from: *www.fsai.ie/publications/other/water_report.pdf*
9. **Environmental Protection Agency (2007)** The Provision and Quality of Drinking Water in Ireland. A Report for the Years 2006-2007. Available from: www.epa.ie

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