

iMIS Food - Biological Hazards - Parasites

Name	Group	Origin	Food Products	Health Effects	Regulation (EU)	Prevention	Comments
<i>Anisakis simplex</i> & spp.	Nematode (roundworm)	Marine cycle involving mammals, crustaceans, and fish/squid. Humans are accidental hosts.	Raw or undercooked marine fish (herring, cod, salmon, mackerel, monkfish) and squid.	Anisakiasis: Acute gastrointestinal symptoms and allergic reactions.	· Reg. (EC) No 853/2004: Mandates visual examination and freezing for raw fish.	Inactivation: · Heating. · Freezing.	Salting and marinating (e.g., ceviche, pickled herring) may not be sufficient to kill the larvae. Farmed Atlantic salmon may be exempt from freezing if the feed and farming conditions are proven to be parasite-free.
<i>Toxoplasma gondii</i>	Protozoa	Cats shed oocysts; livestock form tissue cysts. Contamination via feces, soil, water, meat.	Undercooked or raw meat (pork, lamb, venison). Contaminated raw vegetables, fruits, or water. Unpasteurised milk (especially goat's milk).	Toxoplasmosis: Usually asymptomatic, but dangerous during pregnancy.	· Reg. (EC) No 852/2004 & 853/2004: General hygiene rules.	Inactivation: · Heating. · Freezing. · Thoroughly wash all fresh produce. Wash hands after handling raw meat or soil.	One of the most common parasitic infections. The tissue cysts (bradyzoites) are heat-labile but resistant to salting and curing.
<i>Trichinella spiralis</i> & spp.	Nematode (roundworm)	Larvae encyst in muscle of pigs, wild boar, horses, game. Infection via eating contaminated meat.	Raw or undercooked pork, wild boar, horse meat, and other wild game (bear, fox, walrus).	Trichinellosis: GI symptoms followed by larval migration to muscles (fever, pain). Can be fatal.	· Reg. (EU) 2015/1375: Mandates testing for pork, wild boar, and horse meat.	Inactivation: · Heating. · Freezing.	Incidence in EU commercial pigs is extremely low due to controlled housing. The main risk is from wild game and backyard pigs. Some <i>Trichinella</i> species in wild game are freeze-resistant.
<i>Taenia saginata</i> (Beef tapeworm)	Cestode (tapeworm)	Human feces contaminate environment; cattle ingest eggs; larvae encyst in beef muscle.	Raw or undercooked beef ("beef measles").	Taeniasis: Intestinal tapeworm, mild or asymptomatic.	· Reg. (EU) 2019/627: Mandates post-mortem inspection of cattle.	Inactivation: · Heating. · Freezing.	Does not cause cysticercosis (cysts in the brain) in humans. The hazard is only the intestinal tapeworm.

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<i>Taenia solium</i> (Pork tapeworm)	Cestode (tapeworm)	Human feces contaminate environment; pigs ingest eggs; larvae encyst in pork muscle. Humans can also ingest eggs directly.	Taeniasis: Eating raw or undercooked pork. Cysticercosis: Ingesting eggs via fecal-oral route (contaminated food/water).	Taeniasis: Intestinal tapeworm. Cysticercosis (from eggs): Extremely severe disease (e.g., neurocysticercosis).	• Reg. (EU) 2019/627: Mandates post-mortem inspection of pigs.	Inactivation (meat): · Heating. · Freezing. · Strict GHP to prevent fecal-oral contamination.	Neurocysticercosis (from eggs) is a major public health issue globally.
<i>Echinococcus granulosus</i> & <i>E. multilocularis</i>	Cestode (tapeworm)	Eggs passed in feces of dogs (E.g.) or foxes (E.m.). Humans accidentally ingest eggs.	Contaminated wild-picked produce (berries, mushrooms, greens) or water contaminated with fecal matter from foxes or dogs.	Echinococcosis: Forms large (Cystic) or invasive (Alveolar) cysts in liver/lungs. Alveolar can be fatal.	• Reg. (EC) No 852/2004: General food hygiene rules (GHP).	Inactivation: · Heating. · Standard freezing is not sufficient. · Wash wild-picked foods.	Long latency period. <i>E. multilocularis</i> is a serious concern. Standard freezing is insufficient.
<i>Cryptosporidium parvum</i>	Protozoa	Oocysts shed in feces of animals/humans contaminate water/food.	Contaminated drinking water. Contaminated raw produce (salads, fruits), unpasteurised milk or juice.	Cryptosporidiosis: Profuse, watery diarrhoea. Severe in immunocompromised.	• Reg. (EC) No 852/2004: GHP. • Drinking Water Directive.	Inactivation: · Oocysts are chlorine-resistant. · Heating/Pasteurisation. · Freezing. · Water treatment (filtration, UV).	Common waterborne outbreak cause. Low infectious dose. Chlorine-resistant.
<i>Cyclospora cayetanensis</i>	Protozoa	Human feces contaminate environment; oocysts need time to become infectious.	Imported fresh produce, especially leafy greens (basil, cilantro) and soft fruits (raspberries, blackberries). Contaminated water.	Cyclosporiasis: Prolonged watery diarrhoea, fatigue. Can relapse.	• Reg. (EU) 2017/625: Official controls on imported food.	Inactivation: · Oocysts are chlorine-resistant. · Heating is effective. · GAPs and use of safe irrigation water.	Outbreaks linked to imported produce. Oocysts not immediately infectious.
<i>Giardia duodenalis</i> (lamblia)	Protozoa	Cysts passed in feces of humans/animals	Contaminated drinking water. Contaminated raw food (e.g.,	Giardiasis: Diarrhoea, gas, greasy stools, cramps, malabsorption.	• Reg. (EC) No 852/2004: GHP. • Drinking	Inactivation: · Cysts are relatively chlorine-resistant. · Heating or	Very common cause of parasitic GI disease globally.

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		are directly infectious.	produce) handled by an infected person.		Water Directive.	Freezing. · Good personal hygiene.	
<i>Fasciola hepatica</i> (Liver fluke)	Trematode (fluke)	Herbivore feces contaminate water; snails host larvae; larvae encyst on aquatic plants.	Raw aquatic plants, particularly wild-grown watercress. Raw aquatic vegetables (water mint).	Fascioliasis: Acute phase (fever, pain) and chronic phase (liver/bile duct damage).	· Reg. (EC) 853/2004: Post-mortem inspection of livestock livers.	Inactivation: · Heating. · Freezing. · Sourcing watercress from safe farms.	Important veterinary parasite. Human cases rare in Europe.
<i>Clonorchis & Opisthorchis</i> spp. (Liver flukes)	Trematode (fluke)	Cycle involves snails and freshwater fish. Humans infected via raw/undercooked fish.	Raw, undercooked, pickled, or salted freshwater fish (e.g., carp).	Chronic inflammation of bile ducts. Major risk factor for bile duct cancer.	Not endemic in EU: No specific regulation.	Inactivation: · Heating. · Freezing. · Salting and pickling are not reliable.	Endemic in East/Southeast Asia. Classified as a Group 1 carcinogen by IARC. Risk is relevant for imported fish products.
<i>Paragonimus</i> spp. (Lung fluke)	Trematode (fluke)	Cycle involves snails and freshwater crustaceans. Humans infected via raw/undercooked crustaceans.	Raw or undercooked freshwater crabs or crayfish.	Paragonimiasis: Lung disease. Can migrate to the brain, causing neurological symptoms.	Not endemic in EU: No specific regulations.	Inactivation: · Heating. · Freezing.	Endemic in parts of Asia, Africa, and the Americas. The practice of eating "drunken crab" (marinated raw crab) is a major risk factor.