



## Seafood Health Facts: Making Smart choices Balancing the Benefits and Risks of Seafood Consumption *Resources for Healthcare Providers and Consumers*

### **Parasites [1]**

This section describes food safety issues associated with naturally occurring parasites that could be associated with certain types of seafood products. Information on how to select and handle seafood products to avoid foodborne illness is provided.

All living organisms, including fish, can have parasites. Parasites are a natural occurrence, not contamination. They are as common in fish as insects are in fruits and vegetables. Parasites do not present a health concern in thoroughly cooked fish.

Parasites become a concern when consumers eat raw or lightly preserved fish such as sashimi, sushi, ceviche, and gravlax. When preparing these products, use commercially frozen fish. Alternatively, freeze the fish to an internal temperature of -4°F for at least 7 days to kill any parasites that may be present. Home freezers are usually between 0°F and 10°F and may not be cold enough to kill the parasites.

The health risk from parasites is far less than the risk from “unseen” illness causing bacteria which are present in almost all foods.

Roundworms called nematodes are the most common parasite found in marine fishes. Some people call these nematodes herring worms or cod worms. Actually, several different species exist and it is hard to distinguish between them. All are in the family Anisakidae and are anisakid nematodes (see information below).

Freshwater fish like trout and fish that spend part of their life in freshwater, such as salmon, may carry *Diphyllobothrium* tapeworm larvae (see information below). These small, whitish, and somewhat flabby worms are common in salmon from some areas of Alaska.

The life cycle of an anisakid nematode begins when seals or sea lions eat infected fish. The larval nematodes grow to maturity, and the marine mammal excretes the nematode eggs into the sea where they hatch. Shrimp-like animals eat the larvae, and fish eat the shrimp. The larvae then develop into the form we see in fish.

The life cycle for a tapeworm is similar. Mammals or birds eat infected fish. The eggs hatch in freshwater. Crustaceans eat the eggs, freshwater and anadromous fish eat the crustaceans, and we eat the fish.

Many consumers prefer the delicate flavor and texture of uncooked fish found in sushi and sashimi (thin slices of raw finfish) dishes. But there should be caution in consuming raw fish because some species of fish can contain these harmful worms. Eating raw, lightly cured, or insufficiently cooked infected fish can transfer the live worms to humans. Most of these parasites cannot adapt to human hosts. Often, if an infected fish is eaten, the parasites may be digested with no ill effects. Adequate freezing or cooking fish will kill any parasites that may be present. Raw fish (such as sushi or sashimi) or foods made with raw fish (such as ceviche) are more likely to contain parasites or bacteria than foods made from cooked fish, so it's important to cook fish thoroughly (at least 145°F for 15 seconds) or use commercially frozen seafood in raw dishes.

### **Two types of parasitic worms can infect humans:**

1. Anisakiasis is caused by ingesting the larvae of several types of roundworm which are found in saltwater fish such as cod, plaice, halibut, rockfish, herring, Pollock, sea bass and flounder.
2. Tapeworm infections occur after ingesting the larvae of *diphyllobothrium* which is found in freshwater fish such as pike, perch and anadromous (fresh-saltwater) fish such as salmon.

During commercial freezing fish is frozen solid at a temperature of -35°F and stored at this temperature or below for a minimum of 15 hours to kill parasites. Most home freezers have temperatures at 0°F to 10°F and

may not be cold enough to kill parasites because it can take up to 7 days at -4°F or below to kill parasites, especially in large fish. Good handling practices on-board fishing vessels and in processing plants can minimize nematode infestation. Many seafood processors inspect seafood fillets of species likely to contain parasites. This process called candling involves examining fish fillets over lights. Candling detects surface parasites. Unfortunately, they cannot always see parasites embedded deep in thick fillets or in dark tissue. Candling is also useful for revealing pinbones in fillets that are intended to be boneless.

Fish is also safe to eat after it is cooked to an internal temperature of 145°F for 15 seconds. Normal cooking procedures generally exceed this temperature. If a thermometer is not available to check the internal temperature of the thickest portion of the fish, the fish should be cooked until it loses its translucency and flakes easily with a fork.

If a parasite is present in a fish, you have several options:

Remove the parasite, examine the fish for others and cook the fish. Thorough cooking kills all parasites

Notify the store where you bought the fish so that the store can carefully inspect remaining fish.

Depending on the return policy of the particular store, you may wish to return or exchange the unused portion.

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[1]

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