

# MAS NOTE

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## EATING RAW FINFISH: WHAT ARE THE RISKS, THE BENEFITS?

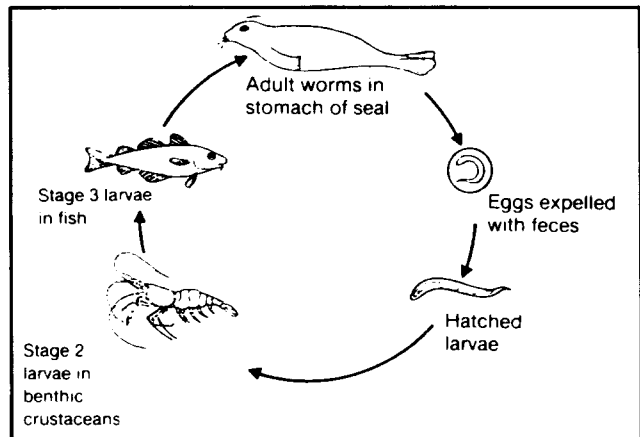
by Doris Hicks, Seafood Technologist (302) 645-4297 and Tracy Schmersal, MAS Intern

Sashimi, thin slices of raw finfish, is now a popular dish in the United States. Originally from Japan, sashimi is commonly served molded over vinegared fingers of rice and called sushi. Many enjoy the taste of sushi and sashimi because of the delicate flavor and texture of the uncooked fish. An added plus is that raw foods have not lost any nutrients to cooking.

Nevertheless, some people are concerned about the presence of parasites in raw fish. These worms are killed by thorough cooking or adequate freezing. Only the ingestion of raw, lightly cured, or insufficiently cooked infected fish can transfer the live worms to humans. Most of these parasites cannot adapt to human hosts; quite frequently, if an infected fish is eaten, the parasites are simply digested with no ill effects.

Fewer than 30 cases of illnesses resulting from the presence of parasites in sushi or sashimi were reported in the U.S. during 1986, and most were on the West Coast. More fish are infected — and therefore more humans — on the West Coast than the East because the primary hosts for the parasites are marine animals commonly found in the Pacific, such as seals, porpoises, sea lions, and whales.

Take a look at the life cycle of a parasitic worm. The parasite matures and reproduces in marine mammals.



*Life cycle of the parasitic worm.*

Next, the parasite eggs pass with the feces into the water, and hatch into larvae. Then, small water creatures such as crustaceans swallow larvae. Fish eat small water creatures and thus become infected. Finally, marine mammals eat fish, and then the whole

cycle starts again. Humans interrupt this cycle by eating fish.

There are two types of parasitic worms that can infect humans. One type of infection, called anisakiasis, is caused by ingesting the larvae of several types of roundworm. Symptoms include abdominal problems and fever, and may resemble appendicitis and intestinal obstruction. Roundworms are found in saltwater fish such as cod, plaice, halibut, rockfish, herring, pollock, sea bass, and flounder.

The other type of infection is caused by a fish tapeworm. This infection occurs after ingesting the larvae of a species called diphyllobothrium, found in freshwater fish such as pike and perch, as well as anadromous (fresh-saltwater) fish such as salmon. An infection by tapeworm is known to deplete the supply of Vitamin B-12 and produces other symptoms including fatigue, diarrhea, weakness, numbness of the extremities, and a feeling of hunger.

It's important to remember that adequate freezing and/or cooking eliminates infection by the parasites. In commercial freezing, a temperature of -40°F kills any parasite in 15 hours. In a home freezer, at 0° to 10°F, it can take up to five days to kill all the parasites, especially in large fish. Fish is also safe to eat when it reaches an internal temperature of 145°F for five minutes. Thus, traditional cooking methods such as baking, broiling, frying, grilling, poaching, and microwaving will kill any potential parasites providing the fish temperature reaches 145°F for five minutes. Similarly, hot smoking of fish, which is a slow process that actually cooks the fish, provides an effective method of eliminating parasites provided the fish is smoked at 150° to 200°F for four to six hours.

On the other hand, cold-smoked products may not be safe to eat unless they've been properly frozen first. Unlike hot smoking, cold smoking does not use heat and the fish doesn't reach the temperature required to kill the parasites. Likewise, ceviche, or raw fish marinated in lemon or lime juice, may contain parasites unless it has been properly frozen before marinating.

It's also important to observe proper sanitation when preparing fish. Cooked fish should not come in contact with uncooked fish or with any package that held the uncooked product. Also, before serving canned seafood, check for indications of spoilage. Discard any jars with

bulging lids, broken seals, or leaking contents. After opening, check the contents for mold or an off odor. If any sign of spoilage is present, throw it out! Proper canning will destroy parasites and *Clostridium botulinum*, a bacteria that causes botulism food poisoning. In addition, people with liver disease shouldn't eat raw fish because they are particularly susceptible to a bacteria, *Vibrio vulnificus*, that may be present.

If you do choose to eat raw fish, a process called candling reduces the risk of infection by parasites. Candling means holding each fillet in front of a light so that any parasites can be seen and then removed. The parasite is a tightly coiled, clear worm, 1/2- to 3/4-inch in length, that imbeds itself in the flesh. Candling is required by any good packing house. The process is quick and inexpensive and avoids much grief. Candling also reveals any pinbones left in a product intended to be boneless.

Finfish is a versatile and delicious source of nutrition. Most fish is low in calories, sodium, and total fat, saturated fat, and cholesterol. Fish is high in protein and a good source of many vitamins and minerals such as thiamin, niacin, phosphorus, potassium, iron, iodine, fluoride, zinc, and copper. The different varieties of finfish are easy to prepare, especially when served raw.

Even though incidences of parasitic infection are rare, there are certain risks associated with eating raw or insufficiently cooked fish. Once consumers are aware of these risks, they can make educated choices about their seafood consumption habits.

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