Parasites [1]

Seafood Choices: Balancing Benefits and Risks (Chapter 4: Health Risks Associated with Seafood Consumption [2]), Eds. M. C. Nesheim and A. l. Yaktine (Institute of Medicine of the National Academies, 2007), "Seafoodborne parasitic infections are not common in the United States." Thousands of parasites exist worldwide, but only about 100 species are known to infect people through consumption of contaminated food or water. There are two types of parasites that can infect people through food or water: parasitic worms and protozoa. Parasitic worms include roundworms (nematodes), tapeworms (cestodes) and flukes (trematodes). These worms vary in size from barely visible to several feet in length. Protozoa are single-cell animals, and cannot be seen without a microscope.

Scientific Publications for Scientific Publications and References

The Institute of Food Technologists' Expert Panel on Food Safety and Nutrition discusses the sources and incidence of human infection by foodborne parasites and the new technologies that are being developed for their prevention, detection, and inactivation

Links to the Centers for Disease Control Laboratory Identification of Parasites of Public Health Concern and FDA's "Bad Bug Book" provide information on causal agents, life cycle, geographic distribution, clinical features, laboratory diagnosis and treatment of the common parasitic worms found in seafood:

Anisakis simplex
Anisakis simplex and related worms – FDA [3]
Anisakiasis – CDC [4]

Pseudoterranova decipiens
Anisakiasis – CDC [4]

Diphyllobothrium latum
Diphyllobothriasis - CDC [5]
Diphyllobothrium spp. – FDA [6]

***Eustrongylides* sp.**
Eustrongylides sp. – FDA [7]

Flukes (flatworms)
Nanophyetus spp. – FDA [8]

Risk of Parasitic Worm Infection from Eating Raw Fish in Hawaii: A Physician's Survey, J. John Kaneko MS DVM and Lorraine B. Medina MPH, Hawaii Medical Journal, Volume 68, October 2009.

Abstract

Public health concerns have been raised over the risk of parasitic helminth (roundworm, tapeworm and fluke) infections from eating raw fish, an increasing US consumer trend. Hawaii consumers eat seafood at nearly 3 times the US national average rate, with a long tradition and high level of raw fish consumption. The local fish species commonly eaten raw in Hawaii include tuna (bigeye, yellowfin, albacore and skipjack), marlin (blue and striped) and deepwater snappers (long-tailed red, pink and blue green). Forty-eight Hawaii based physicians (gastroenterologists, internists, general and family practitioners) were surveyed to count known cases of parasitic worm infection linked to raw fish consumption and to explore physicians' perceptions of risk associated with the consumption of fresh, never frozen local fish with an emphasis on raw tuna and skipjack. No single known case of helminth infection due to consumption of raw tuna or skipjack, or other local fish

species caught in Hawaii was reported. The majority of the physicians surveyed reported that they eat raw yellowfin and bigeye tuna, also eat raw skipjack and do not think that these fish present a significant health risk of helminthic parasites. The survey results support the conclusion that the risk of parasitic helminth infection from the consumption of Hawaii-caught tuna, skipjack, marlin and deepwater snappers is negligible.

Invited review - Fish-borne parasitic zoonoses: Status and issues. International Journal for Parasitology
Volume 35, Issues 11-12, October 2005, Pages 1233-1254

Abstract

The fish-borne parasitic zoonoses have been limited for the most part to populations living in low- and middle-income countries, but the geographical limits and populations at risk are expanding because of growing international markets, improved transportation systems, and demographic changes such as population movements. While many in developed countries will recognize meat-borne zoonoses such as trichinellosis and cysticercosis, far fewer are acquainted with the fish-borne parasitic zoonoses which are mostly helminthic diseases caused by trematodes, cestodes and nematodes. Yet these zoonoses are responsible for large numbers of human infections around the world. The list of potential fish-borne parasitic zoonoses is quite large. However, in this review, emphasis has been placed on liver fluke diseases such as clonorchiasis, opisthorchiasis and metorchiasis, as well as on intestinal trematodiasis (the heterophyids and echinostomes), anisakiasis (due to *Anisakis simplex* larvae), and diphyllobothriasis. The life cycles, distributions, epidemiology, clinical aspects, and, importantly, the research needed for improved risk assessments, clinical management and prevention and control of these important parasitic diseases are reviewed. Click here for link. [9]

Revue scientifique et technique (International Office of Epizootics) 1997 Aug;16(2):652-60. Parasites of fish and risks to public health. Adams AM, Murrell KD, Cross JH. United States Food and Drug Administration, Bothell, Washington, DC 98041-3012, USA.

Abstract

A multitude of parasites have been reported in fish, but only a few species are capable of infecting humans. The most important of the helminths acquired by humans from fish are the anisakid nematodes (particularly Anisakis simplex and Pseudoterranova decipiens), cestodes of the genus Diphyllobothrium and digenetic trematodes of the families Heterophyidae, Opisthorchiidae and Nanophyetidae. Seafood-associated infections by acanthocephalans are rarely reported in humans. All of the helminths mentioned above are associated with social-cultural and behavioural factors, in particular the consumption of raw or undercooked seafood. Measures can be taken during harvesting, processing or post-processing (e.g., by the consumer) to mitigate the risks of infection. The seafood industry and government authorities can apply various programmes to reduce these risks, including good manufacturing practices (GMPs) and hazard analysis and critical control point (HACCP) systems. Such measures may include avoiding particular harvest areas, sizes of fish, or even particular species of fish. The method of capture, handling and storage of the catch can directly affect the quality of the seafood with regard to the presence and numbers of parasites. The extent of processing--including heading and gutting, candling and trimming--and the type of product derived (fresh, frozen, salted or pickled) can all contribute to the control of the risks posed by helminths. The most effective means of killing the parasites are either freezing or heat inactivation.

PMID: 9501379 [10] [PubMed - indexed for MEDLINE]

CDC: A-Z Index of Parasitic Diseases [11]

CDC: National Center for Zoonotic, Vector-Brone and Enteric Diseases, Division of Parasitic Diseases, DPDx, Laboratory Identification of Parasites of Public Health Concern. DPDx is a web site developed and maintained by CDC's Division of Parasitic Diseases with the goal to strengthening diagnosis of parasitic diseases globally. The web site includes description of parasites and parasitic diseases, image library, diagnostic procedures, and diagnostic assistance. Click here for link. [12]

The US Food and Drug Administration's "BAM" (Bacteriological Analytical Manual) has a chapter on Parasitic Animals in Foods which discusses techniques for examining foods for the presence of parasites. An in-depth

discussion of the candling method with finfish and molluscs is described. Click here for link [13].

The US Food and Drug Administration's "Bad Bug Book" (Foodborne Pathogenic Microorganisms and Natural Toxins Handbook) includes basic facts on foodborne pathogenic microorganisms and natural toxins. The material is collected from the Food and Drug Administration, the Centers for Disease Control & Prevention, the USDA Food Safety Inspection Service, and the National Institutes of Health.

> Bad Bug Book: *Anisakis simplex* and related worms [3]
> Bad Bug Book: *Diphyllobothrium* spp. [6]

The chapter on Potential Hazards in Cold-Smoked Fish: Parasites in the US Food and Drug Administration scientific publication on "Safe Practices for Food Processes" discusses the presence of parasites in raw, frozen and smoked fish, and the effects of processing steps (salting, cold-smoking, freezing, and irridation) used in controlling parasites. Click here for link [14].

"Fish Parasites and Human Health, Epidemiology of Human Helminthic Infections" includes the life cycles of common parasites in freshwater and marine fishes, transmission, and prevention. Click here for link [15].

Source URL:
https://www.seafoodhealthfacts.org/seafood-safety/scientific-publications-and-references/seafood-safety-topics/parasites

Links
[1] https://www.seafoodhealthfacts.org/seafood-safety/scientific-publications-and-references/seafood-safety-topics/parasites
[2] http://www.nap.edu/catalog/11762.html
[3] http://www.fda.gov/Food/FoodSafety/FoodborneIllness/FoodborneIllnessFoodbornePathogensNaturalToxins/BadBugBook/ucm070768.htm
[4] http://www.dpd.cdc.gov/dpdx/HTML/Anisakiasis.htm
[5] http://www.dpd.cdc.gov/dpdx/HTML/Diphyllobothriasis.htm
[6] http://www.fda.gov/Food/FoodSafety/FoodborneIllness/FoodborneIllnessFoodbornePathogensNaturalToxins/BadBugBook/ucm070785.htm
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[8] http://www.fda.gov/Food/FoodSafety/FoodborneIllness/FoodborneIllnessFoodbornePathogensNaturalToxins/BadBugBook/ucm070793.htm
[9] http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6T7F-4GYH6KK-4&_user=4421&_coverDate=10%2F31%2F2005&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1410062266&_rerunOrigin=scholar.google&_acct=C000059598&_version=1&_urlVersion=0&_userid=4421&md5=41aca15cc48073b806f346821e7d4bfb
[10] http://www.ncbi.nlm.nih.gov/pubmed/9501379/
[11] http://www.cdc.gov/ncidod/dpd/parasites/index.htm
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[13] http://www.fda.gov/Food/ScienceResearch/LaboratoryMethods/BacteriologicalAnalyticalManualBAM/UCM071468
[14] http://www.fda.gov/Food/ScienceResearch/ResearchAreas/SafePracticesforFoodProcesses/ucm094578.htm
[15] http://nsgl.gso.uri.edu/cuimr/cuimrt95001.pdf