BC Centre for Disease Control
An agency of the Provincial Health Services Authority

Environmental Health Services

Food Issue

Notes from the Field

Parasite hazards in imported flounder and lobster served raw

Request received from:	Regional Health Authority
Date of request:	February 20, 2014
Issue (brief description):	Two issues regarding parasite hazards 1. Raw lobster sashimi from tanks 2. Raw flounder imported from Asia

Disclaimer: The information provided in this document is based on the judgement of BCCDC's Environmental Health Services Food Safety Specialists and represents our knowledge at the time of the request.
It has not been peer-reviewed and is not comprehensive.

Summary of search information

1. Internet sources
2. Ovid Agricola "lobster" AND "parasite" →8 citations, none of human health relevance. PubMed→30 citations, none of human health relevance.
3. Other: contact CFIA re: flounder issue; look for experts re: lobster

Background information

Imported flounder from Korea: This product is displayed as "bastard halibut", but is really *Paralichthys olivaceus*. Two CFIA personnel have responded to this inquiry. One person commented on the sanitary health certificate (see photo provided in appendix) and stated that it only attests that the fish provided is "bastard halibut" or *P. olivacues*. Unless an additional statement on the certificate was provided to verify it was parasite-free and suitable for sashimi, it would not be considered as such. He agreed this fish was unsuitable for sale raw; as a groundfish it would be prone to parasites. He found that the supermarket does not have a valid import certificate, and wanted to know the supplier of this product, so they could be followed up. He also mentioned that eating raw halibut was a common cultural practice in Korea. Another person supplied the standards to fillet and block pieces of raw or fresh groundfish. However, these standards do not apply to whole round (live and ungutted) fish. Fish is rejected based on numbers of parasites per kg of weight – not more than 1 per kg are allowable.
http://www.inspection.gc.ca/food/fish-and-seafood/manuals/standards-and-methods/eng/1348608971859/1348609209602?chap=6#s11c6

Atlantic lobster served as raw sashimi: In at least one restaurant in Fraser Health, raw lobster stored in a tank is brought to the table and killed to be served as raw sashimi.

What are the risks associated with raw flounder and raw lobster?

Flounder: According to the FDA Fish and Fisheries Products Hazards and Controls Guidance, Table 3-2 vertebrate hazards, flounder (*P. olivaceus*) contains a parasite hazard.[1] They may also be subject to chemical environmental hazards, dependent on the growing area.

Lobster: According to the FDA Fish and Fisheries Products Hazards and Controls Guidance, Table 3-3 invertebrate hazards, Atlantic lobster (*Homarus* spp.) does not contains a parasite hazard.[1] Neither does Norway lobster (*Nephrops norvegicus*), Rock lobster (*Jasus* spp.), Spiny (or rock) lobster (*Palinurus* spp.) or Slipper lobster (*Ibacus ciliatus, Scyllarides spp., Thenus orientalis*). If cultivated on land, Atlantic lobster may be prone to aquaculture drugs.[1] Atlantic lobster held in pounds, however, does contain a potential aquaculture products hazard. [1] A literature search uncovered that parasitic fungus, dinoflagellates and ciliates can all affect these crustaceans, however, none are of human significance.[2-4] A recent review by experts of lobster diseases found problems in the culture, ecology and commercial fisheries, however, no impact on human health was noted. http://www.int-res.com/abstracts/dao/v100/n2/ Chemical hazards, if lobsters are harvested in sites impacted by metals or pollutants may be an issue. To monitor lobster sales in Eastern Canada, road-side sales of lobsters require a permit, although there is no fee http://www.novascotia.ca/snsmr/paal/agric/paal006.asp

Previous guidance on parasite hazards from British Columbia

Flounder: A BCCDC document, Guideline for the Exemption of Certain Species of Tuna and Farmed Fish from the Parasite Destruction Processes (Freezing) Prior To Service In a Raw or Lightly Cooked Form outlines the species of fish exempted from freezing.[5] There are 6 species of tuna, and an exemption for farmed fish being fed pelleted foods. Flounder is not listed, neither is the dietary habits of this imported fish.

Lobster: A BCCDC document, *Guideline for Live Retail Fish Holding Systems,* outlines the order of fish, crustaceans and shellfish for shared tank water flow.[6] We would not recommend that the lobsters be in the same tank as any finfish, or share any water downstream from a finfish tank. Although there is little evidence to show that lobsters may have parasites of human concern, we are certain that finfish do. Thus, it would not be recommended for lobsters to share water with or receive any water from finfish tanks.

Recommendations from BCCDC

A recent Vancouver Sun article (May 3, 2014) highlighted that with over 600 sushi restaurants in the Vancouver area, there are more sushi restaurants in the lower mainland than there are in Los Angeles. Sushi practices and boundaries are pushed here more than anywhere else in the world, while training is likely lower. On-line restaurant inspection data in the one lower mainland Health Authority found significantly more violations in Japanese restaurants when compared to other South and East Asian cuisines (P. Cseke, BCIT abstract for this project can be found at this link):

http://contentpro.lib.bcit.ca/iii/cpro/DigitalItemViewPage.external?lang=eng&sp=1005129&sp=T&sp=1&suite=def

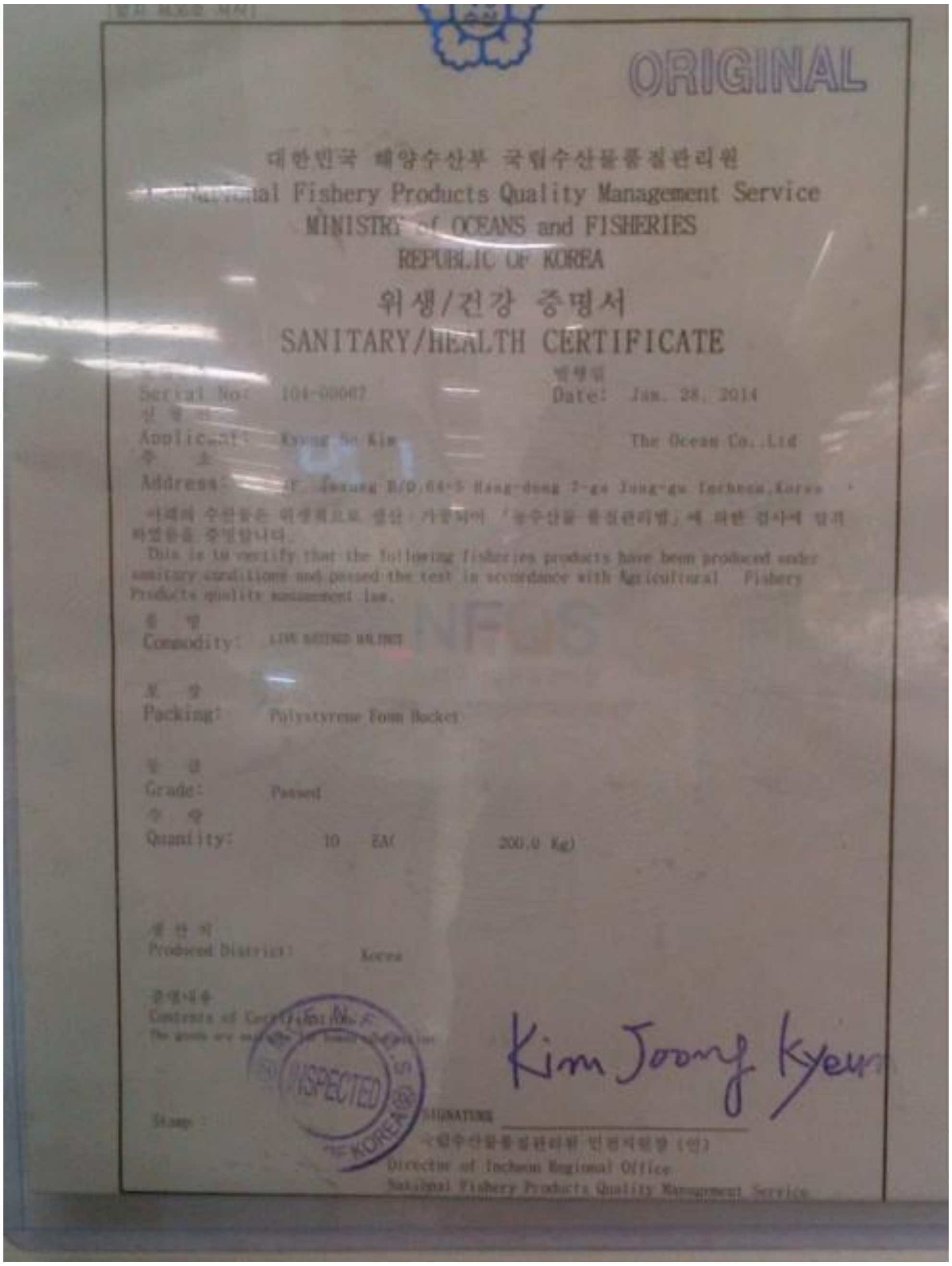
Flounder: Consistent with the advice of CFIA and with the web-site guidelines, BCCDC would not find the sale of raw flounder an acceptable practice, unless the fish was either frozen for parasite control or properly cooked to an internal temperature of 63°C for 15 seconds.[7]

Lobster: There does not appear to be a parasite hazard with this species that is of human health concern. However, the growing area, storage conditions and good manufacturing practices related to hygienic handling of this animal would be important to limit exposure to other hazards of concern known to collect in aquatic animals and affect human health. These might include chemical heavy metals from a contaminated growing area; norovirus or hepatitis viral carriage if exposed to sewage polluted waters or other species containing these viruses, or contamination by food handlers with baterial hazards such as *Salmonella.* As outlined, water sources for live tank storage should not be shared with finfish or any species contaminated with transmissible hazards.

Specific to lobster the BCCDC recommends:

- Proper hygienic practices and hand-washing for persons working with live tanks, per FDA food code (2-403.11)[7]
- Water source for tanks meet BCCD guidelines[6]
- Lobsters are verified to be from an approved source per the Food Premise Regulation.[8]

Appendix



ORIGINAL

대한민국 해양수산부 국립수산물품질관리원

National Fishery Products Quality Management Service

MINISTRY of OCEANS and FISHERIES

REPUBLIC OF KOREA

위생/건강 증명서

SANITARY/HEALTH CERTIFICATE

Serial No: 104-00067

Date: Jan. 28, 2014

Applicant: Kyung Su Kim

The Ocean Co.,Ltd

Address: Incheon,Korea

This is to verify that the following fisheries products have been produced under sanitary conditions and passed the test in accordance with Agricultural Fishery Products quality management law.

Commodity:

Packing: Polystyrene Foam Bucket

Grade: Passed

Quantity: 10 EA(200.0 Kg)

Produced District: Korea

Contents of Certification:

Stamp:

INSPECTED

KOREA

Kim Joong Kyeun

SIGNATURE

Director of Incheon Regional Office

National Fishery Products Quality Management Service

References

1. Food and Drug Administration. Fish and Fisheries Products Hazards and Controls Guidance. Rockville, MD: US Food and Drug Administration; 2011 [cited 2014 May 6]; 4th ed:[Available from: http://www.fda.gov/food/guidanceregulation/guidancedocumentsregulatoryinformation/seafood/ucm2018426.htm.

2. Athanassopoulou F, Speare D, Cawthorn RJ, et al. Pathology of Anophryoides haemophila (Scuticociliatida: Orchitophryidae), parasite of American lobster Homarus americanus kept under experimental conditions.

3. Jahnke KD, Bahnweg G. Activity and structural characteristics of steroid and non-steroid lipid growth factors for Haliphthoros milfordensis, a fungal parasite of marine crustaceans.

4. Small HJ, Shields JD, Neil DM, et al. Differences in enzyme activities between two species of Hematodinium, parasitic dinoflagellates of crustaceans.

5. BC Centre for Disease Control. Guideline for the Exemption of Certain Species of Tuna and Farmed Fish from the Parasite Destruction Processes (Freezing) Prior To Service In a Raw or Lightly Cooked Form. 2010 [cited 2014 May 6]; Available from: http://www.bccdc.ca/NR/rdonlyres/9B014365-787D-4136-9B46-0D77E7D0E975/0/GuidelineExemptionofFishSpeciesfromParasiteDestrProcessesJan2010.pdf.

6. BC Centre for Disease Control. Live Retail Fish Holding Guidelines. Vancouver, B.C. 2013. Available from: http://www.bccdc.ca/NR/rdonlyres/1F7F584B-FFCB-442A-BD2A-30CA90A09643/0/RetailFishHoldingTankGuidelines_Nov2013trs.pdf.

7. U.S. Food and Drug Administration. Food Code. Silver Spring, MD2013. Available from: http://www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/ucm374759.htm.

8. Government of British Columbia. Food Premises Regulation. Victoria, B.C.: Queen's Printer; 1999; Available from: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/11_210_99.