Towards an improved image of aquaculture products regarding food safety

ParaFishControl Final Conference
“Innovative Strategies to Control Parasites in Aquaculture Farms”
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Background

- A zoonosis is an infectious disease caused by bacteria, viruses or parasites that spreads between animals and humans.

- Fish parasites (zoonotic helminths) can cause infectious disease in humans.

- Nematodes of the family Anisakidae mainly in marine species:
  - *Anisakis simplex* is considered an emergent biological hazard.
  - The annual number of anisakiasis cases in Spain is estimated to be between 7,700 and 8,320 (Bao et al., 2017).

- Cestodes and trematodes in freshwater species.
Anisakiasis is a parasitic disease caused by nematodes (worms) that attach to the wall of the esophagus, stomach, or intestine.

Symptoms are abdominal pain, nausea, vomiting, abdominal distention, diarrhea, blood and mucus in stool, mild fever and allergic reactions (rash, itching and anaphylaxis).
Background (A. *simplex*)

Scientific Opinion on risk assessment of parasites in fishery products
[BIOHAZ. EFSA Journal 2010; 8(4):1543]

- No sea fishing grounds can be considered free of A. *simplex* larvae
- All wild caught seawater and freshwater fish must be considered at risk of containing viable parasites
- The risk of infection after consuming farmed Atlantic salmon, reared in floating cages/onshore tanks and fed compound feedstuffs, is negligible
- Apart from farmed Atlantic salmon, sufficient monitoring data are not available for any other farmed fish (in 2010)
It is generally assumed that farmed fish products have a very low or null prevalence of these helminths. However, this assumption has not been demonstrated scientifically.

In 2014, SFS-10-2014/2015 call included the topic for new project.
**General objective**
To reduce the undesirable presence of zoonotic helminths in aquaculture fish products

**RISK ASSESSMENT**
Parasite infection: Marine and freshwater surveys
Allergy: Allergenicity tests (*in vivo, in vitro* and *ex-vivo*)

**RISK MANAGEMENT**
Identification of Critical Points with HACCP risk tool
Recommending prevention and systematic control solutions

**RISK COMMUNICATION**
Exchanging information throughout interested parties
Good Practice Handbook for Minimum Parasite Infection
Comprehensible and translational Visual Thinking Strategy
Sampling (2016-2018)

n=10,813 (1,480 runts)

CL 99%
MoE 4-8%
Detection

Real Time PCR

Viscera
Ventral fillets
Dorsal fillets
Head and bones

Visual inspection and UV-press method

Apromar, 2012
Results

n=10,813 (1,480 runts)

No zoonotic helmints were detected (n=10,813)
Conclusions

Flow chart to evaluate the zoonotic risk due to parasites along the production chain

HOWEVER, ZERO RISK DOESN’T EXIST
Smart solutions to reduce risk

Voluntary Control System (VCS)

The proposal of VCS is based on this certification, aimed at the aquaculture sector, raises the profile of aquafarming businesses which, in addition to implementing measures to prevent the presence of anisakis, implement an exhaustive analytical control plan that allows them to confirm that aquaculture products do not represent a health hazard regarding to the presence of zoonotic parasites.

This certification includes:
- Sampling plan
- Externals (single annual) and internal audits (conducted throughout the year)
- Exhaustive analytical plan (by Real Time PCR)
- Auditing documental control (registers, batch control, claims management)
- Etc...

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Smart solutions to reduce risk

Under this future scenario and to enforce the certification of aquaculture products, we have also developed...

Smart and portable solutions

- An app for mobile devices based on the intercalibrated uv-press method (CSIC)
- Digestion portable system makes it available for farmers (KU)
- A portable molecular kit for the detection of *Anisakis simplex* (AZTI)
Impact for the Aquaculture Industry

- **Improvement of image** of European Aquaculture
- Increase of the **commercial value** of fish products from aquaculture
- Possible **exemption from the freezing treatment** for fish products intended to be consumed raw/undercooked following the Commission Regulation (EU) No 1276/2011 (already done for Atlantic salmon)
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Thank You

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