

# RE-EVALUATION OF EFSA OPINION 2010 ON PARASITES IN FISHERY PRODUCTS PART 2

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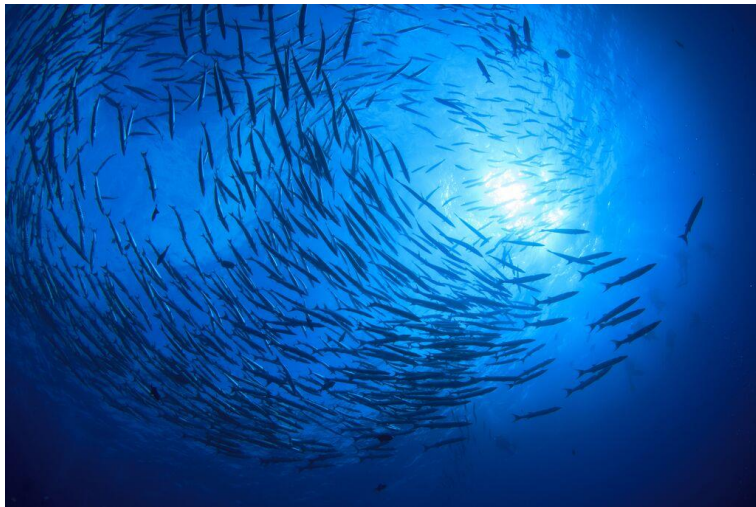
G5 - Food Hygiene, Feed and Frauds

(Based on EFSA presentation)

# TERM OF REFERENCE

EFSA was asked to update certain aspects of its Scientific Opinion of April 2010 on risk assessment of parasites in fishery products based on any new scientific evidence that may have become available since then.

In particular, EFSA is requested to review and assess:



Whether any particular species of **wild caught fish** originating from **specific fishing grounds** could be regarded as **not** representing a health hazard with regards to the presence of parasites of public health importance.

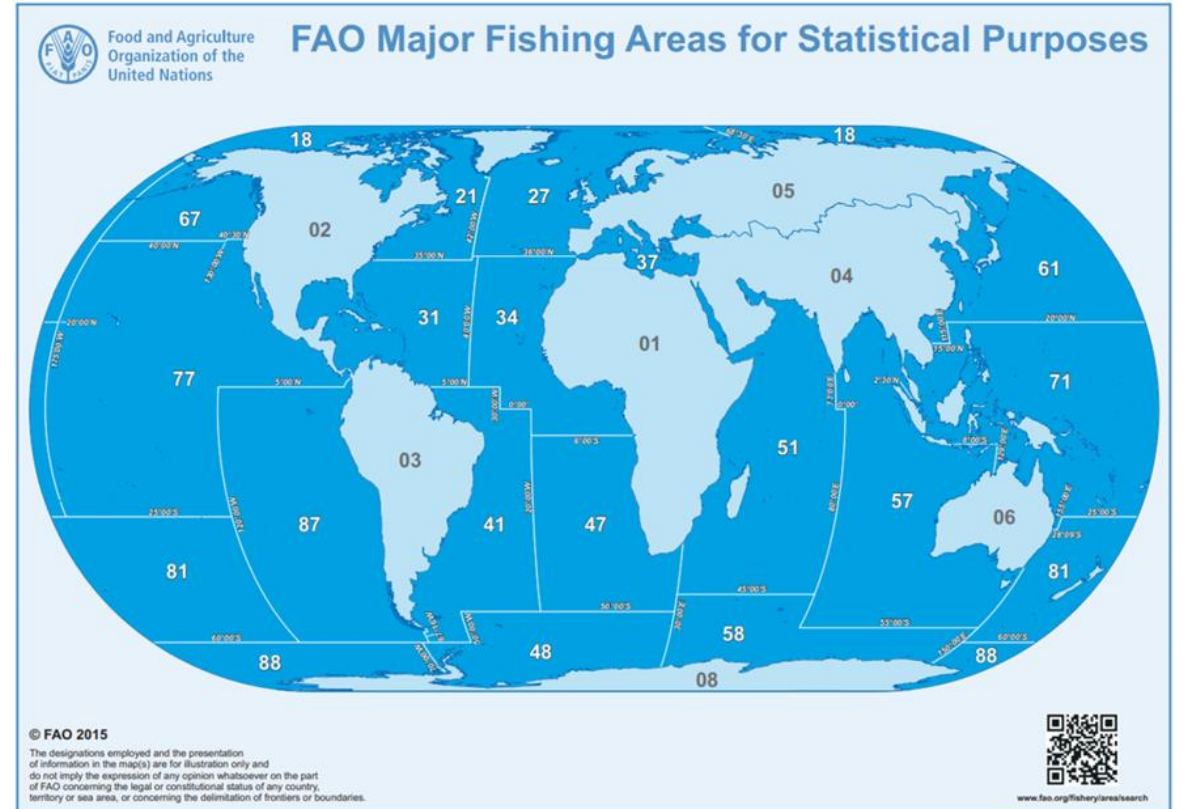
# INTERPRETATION OF TORS

Included only:

- wild caught **finfish species** imported/landed as fresh fish
- zoonotic parasites infecting finfish

FAO categorization is used

- 19 major marine areas
- 8 freshwater areas



# INTERPRETATION OF TORS – MARINE WATERS

- The presence of **at least one zoonotic parasite**, in **at least one fish species**, indicated that the fishing area in which that fish was caught was **not parasite-free** and all fish species from that fishing area could potentially be infected with zoonotic parasites.
- ***Anisakis sp.*** was used as an ‘indicator’ parasite in marine waters
- If there was no record of occurrence of *Anisakis sp.* in fish from a fishing ground or all tests were negative, other parasites, including *Contracaecum osculatum* (s.l.) and/or *Phocanema sp.* were considered.



# INTERPRETATION OF TORS – FRESHWATER

- As the entire life cycles of zoonotic *Anisakis* are usually not completed in freshwater ecosystems, these parasites are not used as an indicator for the presence of zoonotic parasites in freshwater fishing areas.
- **Instead, the literature search was extended to cover other zoonotic parasites in all fish species caught in freshwater areas**



# RESULTS: MARINE FISHING AREAS



- *Anisakis* sp. were reported to be detected in many wild caught fish species in **all** FAO marine fishing areas except area 58 (Indian Ocean, Antarctic), for which there was no data on the occurrence of *Anisakis* sp.
- However, *Phocanema decipiens* (s.l.) and *Contracaecum osculatum* (s.l.) were found in multiple fish species from fishing area 58 (Indian Ocean, Antarctic)

**TABLE 4** Occurrence of zoonotic *Anisakis* species in finfish caught in FAO marine fishing areas. Full details are provided in Thébault et al., 2024

FAO marine fishing areas	Fish species	References
Area 18: Arctic Sea	<i>Boreogadus saida</i>	Køie (2009)
Area 21: Northwest Atlantic	<i>Merluccius bilinearis</i>	Fuentes, Madrid, Cuesta, et al. (2022)
	<i>Gadus morhua</i>	McClelland and Melendy (2011), Mouritsen et al. (2010), Münster et al. (2015), Severin et al. (2020)
	<i>Gadus ogac</i>	Mouritsen et al. (2010)
Area 27: Atlantic, Northeast	<i>Belone belone</i>	Rolbiecki et al. (2020)
	<i>Clupea harengus</i>	Bao et al. (2017), Levsen and Lunestad (2010), Levsen, Svanevik, et al. (2018), Mattiucci, Giulietti, et al. (2018), Shevchuk et al. (2020), Unger et al. (2014)



# RESULTS: FRESHWATER AREAS



- **Area 1 (African inland waters):**
  - *Dibothriocephalus latus* in *Pseudotolithus* spp. (ray-finned fish belonging to the family *Sciaenidae*)
- **Area 2 (North America inland waters):**
  - *Dibothriocephalus* spp. in Arctic char (*Salvelinus alpinus*)
- **Area 3 (South America inland waters):**
  - *Dibothriocephalus* spp. in a multiple fish species
- **Area 4 (Asia inland waters) and Area 5 (Europe inland waters):**
  - A range of zoonotic parasites in multiple fish species
- **Area 6 (Oceania inland waters):**
  - *Contracaecum bancrofti*, *Echinostoma* sp., *Clinostomum* sp. in multiple fish species
- **Area 8 (Antarctica) no data**



# CONCLUSIONS - 1



- It was concluded to be 99%–100% certain (almost certain) that **there are no particular species of wild caught fish** originating from specific marine fishing areas, where the fish consumed in the EU/EFTA are **free of parasites** of public health importance.
- Based on the data reported in the peer reviewed literature, **at least one zoonotic parasite has been reported in at least one fish species** in each of the FAO marine fishing areas (*Anisakis* spp. in all fishing areas, except area 58, but in which *Phocanema decipiens* (s.l.) and *Contracaecum osculatum* (s.l.) were reported in multiple fish species).
- **Thus, due to relative low fish host specificity of the zoonotic parasites, the panel concluded that all relevant fish species may be exposed to and infected with zoonotic parasites.**



## CONCLUSIONS - 2

- The same applies to freshwater fishing areas from which fish are consumed in the EU/EFTA, as **all fishing areas, except for Antarctica, have some or multiple studies reporting the presence of a range of different zoonotic parasites in the caught fish species.**
- The conclusion on marine fishing areas is **consistent** with that of the 2010 opinion which stated that no sea fishing grounds could be considered to be free of *Anisakis simplex* (s.l.) larva.



# PREVIOUS CONCLUSIONS (FIRST PART)

**ToR 1: The occurrence of parasites of public health importance in fishery products derived from the most relevant farmed fish species in the EU (in particular, but not limited to, Atlantic salmon, seabass, farmed seabream and turbot).**

- The experts consider it to be 99%-100% certain (almost certain) that fish produced in recirculating aquaculture systems (RAS), or indoor or roofed facilities with filtered and/or treated water intake are not exposed to parasites provided the fish is exclusively fed heat-treated feed.
- Fish farmed in open marine offshore cages or open flow-through freshwater ponds or tanks can be exposed to zoonotic parasites..



# PREVIOUS CONCLUSIONS (FIRST PART)

## ToR 2: Diagnostic methods for the detection of parasites of public health importance in fishery products from such farmed fish species

- Some methods described in 2010 are still in use: visual inspection (candling), artificial digestion (now ISO 23036-1:2021) and the UV-press method (now ISO 23036-2:2021).
- New UV-scanning devices, Novel optical (hyperspectral) sensing methodologies (still require further development)
- Molecular identification: PCR-amplification and sequencing targeting both nuclear/mitochondrial sequences. Genetic/molecular approaches + microscopic identification are the most reliable identification methods.
- OMICs (genomics, metagenomics, transcriptomics, and proteomics) data are useful resource for selection of molecular/genetic markers for the identification/characterization of zoonotic parasites.
- Artificial intelligence and machine learning algorithms in image and video processing are being tested for high throughput detection/identification of parasites in fish.



# PREVIOUS CONCLUSIONS (FIRST PART)

## **ToR 3: Technical developments and new scientific data available in relation to killing viable parasites of public health importance in fishery products, in particular treatments other than freezing**

- High pressure processing (HPP), pulsed electric field (PEF), natural products, have been successful in killing the parasites under defined laboratory conditions, but need to be verified under commercial conditions
- New high throughput technological/instrumental solutions to observe mobility (limited use so far). Other in vitro tools for larval behavior and physiology are becoming available, may be used for parasite infectivity.
- Model systems to quantitatively characterize thermal inactivation show negative exponential relationship between lethal times and heating temperature. The susceptibility of Anisakis larvae to isothermal lethal conditions could be described by Weibull model. However, the actual lethal combinations vary among studies and parasite species, and more data are needed both in model systems and real food products.
- Advanced processing techniques for intelligent parasites removal (gutting and trimming) operations could have a significant impact on removing parasites from fish in the future.



## NEXT STEPS

**Discussion with Member States and industry in order to verify if possible changes in the legislation are needed based on EFSA's conclusions.**

