20th Workshop of the National Reference Laboratories for Parasites

28-29 October 2025, Istituto Superiore di Sanità, Rome, Italy

Application of Standardized EURLP Methodologies in the Surveillance of Parasites in Important Wild Fish Species in Norway

Paolo Cipriani, Miguel Bao, Arne Levsen, Lucilla Giulietti

Section Seafood Hazards - Institute of Marine Research, Bergen, Norway

Institute of Marine Research
Bergen - Norway

Section Seafood Hazards
National Reference Laboratory (NRL) for anisakid nematodes in fish and fishery products

Responsible Person:
Lucilla Giulietti – PhD
Former: Paolo Cipriani – Senior Researcher

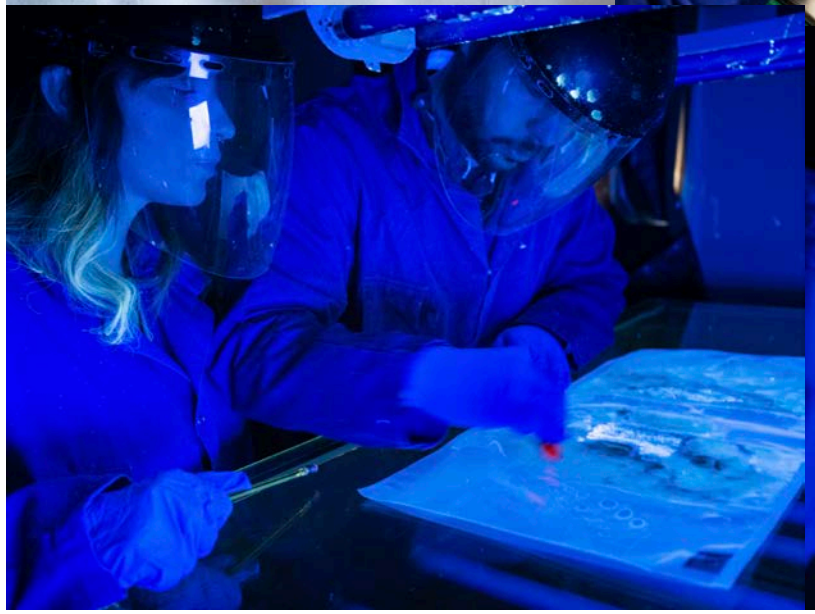
Participation to Profiency testing 2025
FINAL EVALUATION: Positive

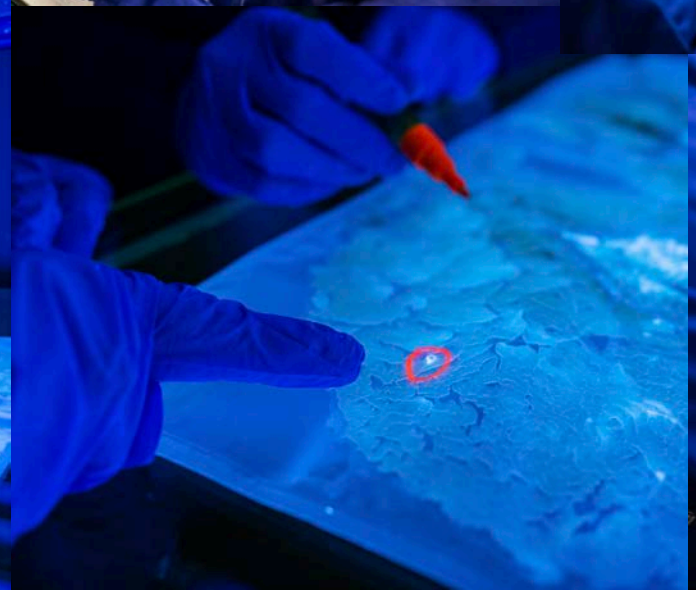
PT-04 “Detection of Anisakidae L3 larvae in fish fillets”

PT-07: “Molecular identification of anisakid nematodes at the species level”

PT-04 “Detection of Anisakidae L3 larvae in fish fillets”

UV-press method INTERNATIONAL STANDARD - ISO 23036





PT-07: “Molecular identification of anisakid nematodes at the species level”

PCR-RFLP based on PCR amplification of the ITS-1-5.8 S-ITS-2 fragment of rDNA

Now,
Real life in Norway

2024 was the best year ever for Norwegian seafood exports

Last updated 6. January 2025, 07:01.

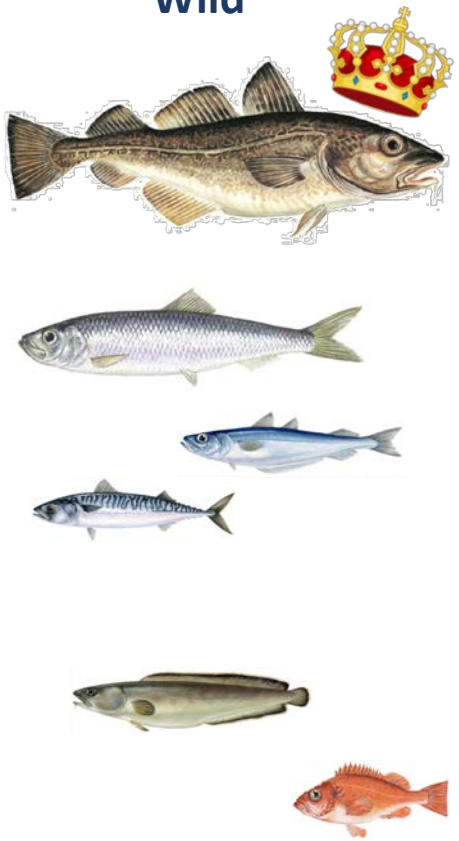
The first half of 2025 was the best ever for Norwegian seafood exports.

Norway exported 1.3 million tonnes of seafood setting an export record.

Norsk fish league rankings

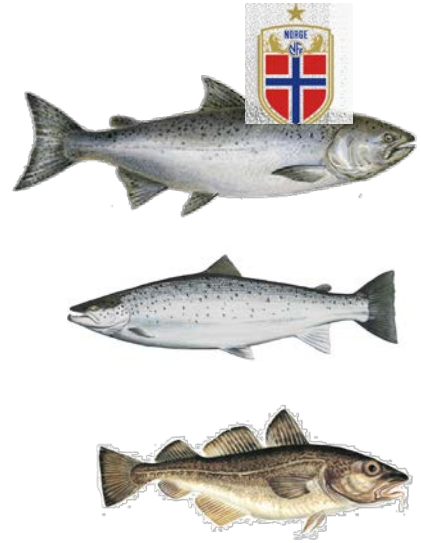
Salmon, cod and mackerel most important species

Wild



	Value in 1000 NOK	Change in value	Quantity in tonnes	Change in volume
Salmon	64 673 627	5 %	1 006 272	3 %
Cod	9 108 851	5 %	216 087	1 %
Mackerel	4 113 020	1 %	335 906	9 %
Trout	2 860 486	-27 %	39 995	-42 %
Herring	2 827 303	-9 %	291 591	24 %
Saithe	1 904 899	6 %	83 625	15 %
Haddock	1 682 269	16 %	74 675	5 %

Farmed

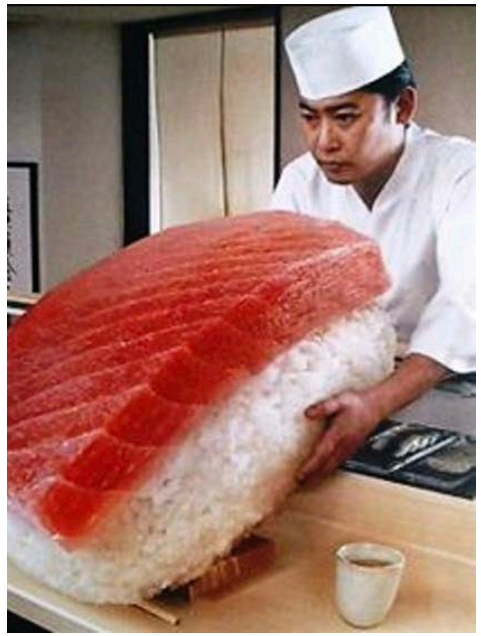


Low to none Anisakis-related cases in Norway

Problems mainly related to
seafood quality and exports

Food safety, and food quality

The application of simple rules (freezing/cooking) eliminate zoonotic risk



Massive infections by anisakid nematodes severely impact seafood appealing, generating distrust in consumers

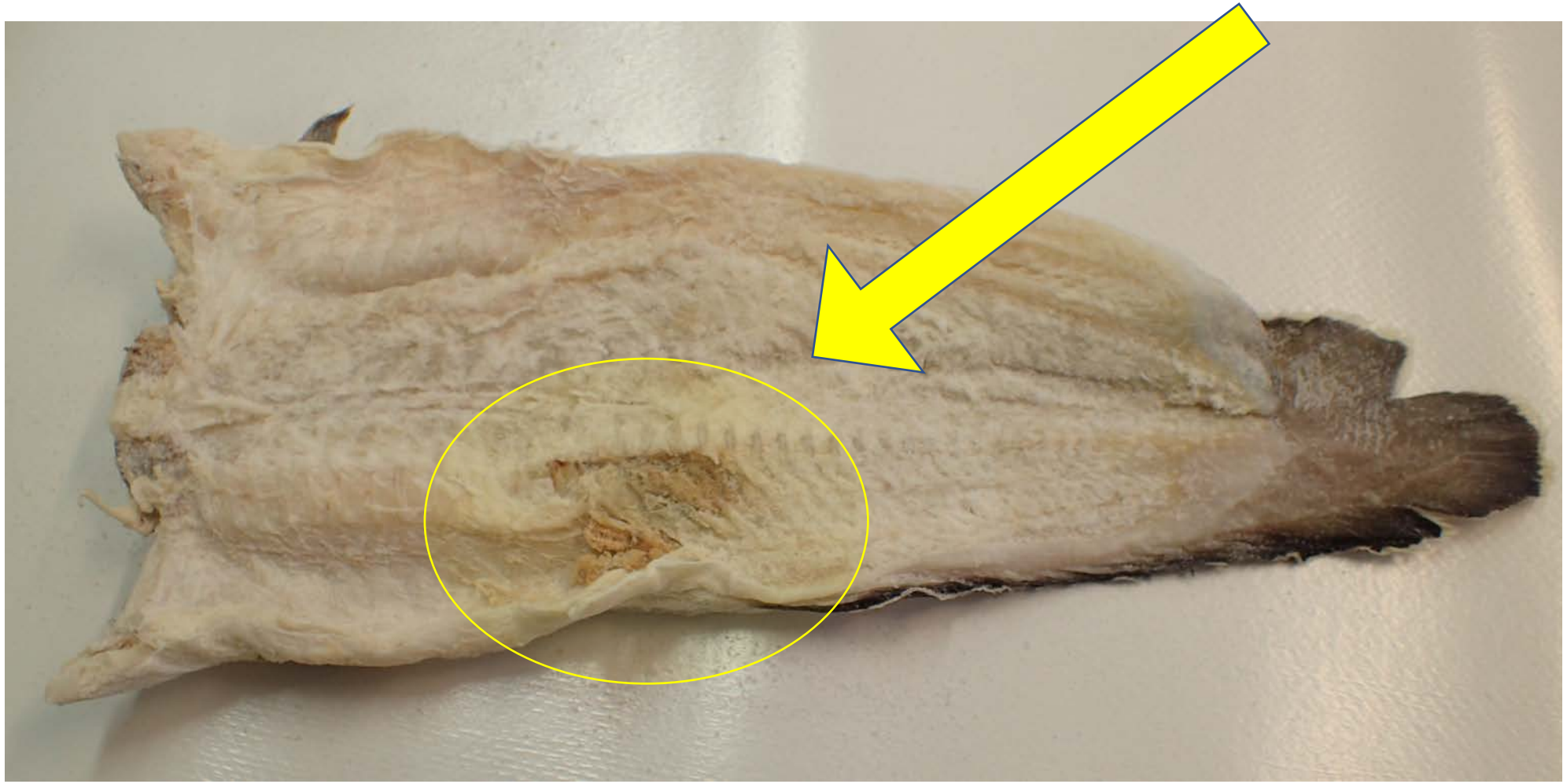
National Reference Laboratory (NRL) for anisakid nematodes

How, where and when we apply Standardized EURLP Methodologies in the Surveillance in Norway?

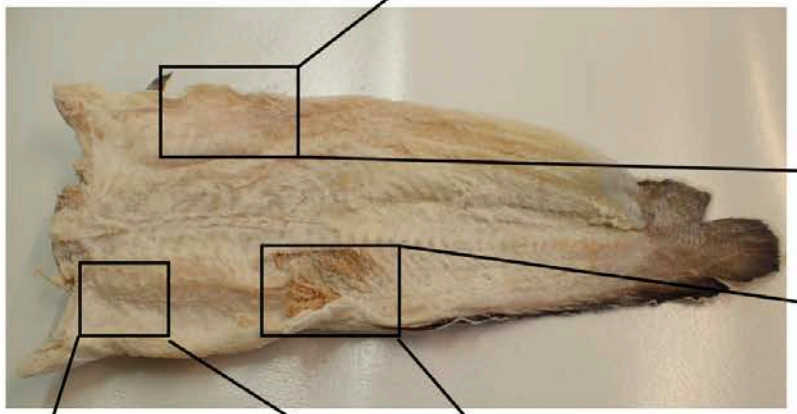
Food quality issues/cases

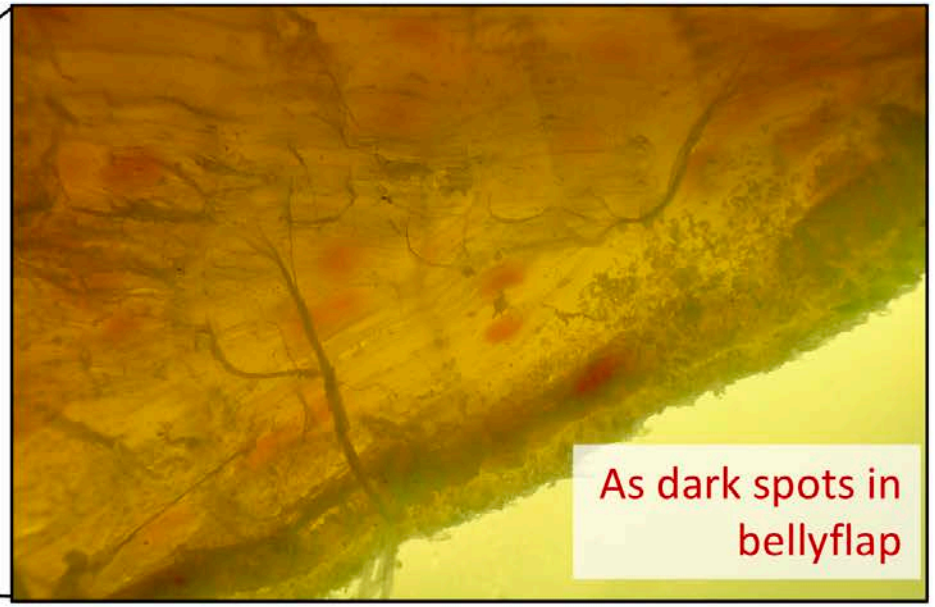
Mattilsynet
(Norwegian Food Safety Authority)

Klipfisk (salted stockfish) made from tusk rejected **for visible larvae!**



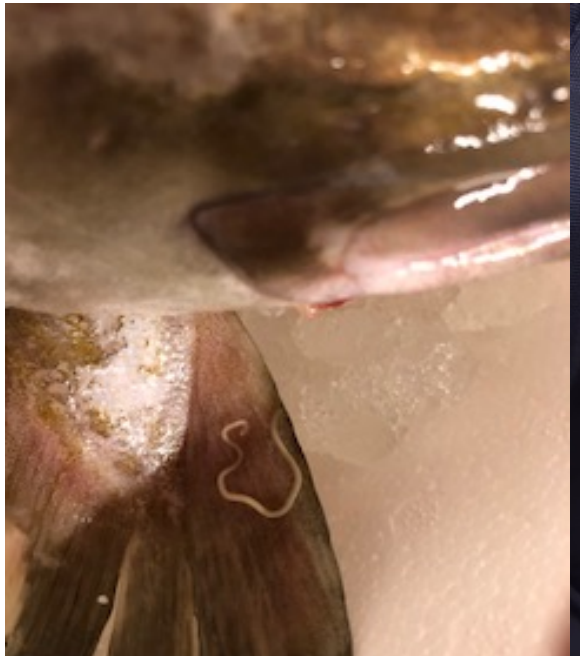
Dried/salted fish.
We relied on candling
UV-press not applicable





Food quality issues/cases

The «*Hysterothylacium* issue» in cod



Food Control 121 (2021) 107724

Contents lists available at ScienceDirect

Food Control

journal homepage: www.elsevier.com/locate/foodcont

Quality issues related to the presence of the fish parasitic nematode *Hysterothylacium aduncum* in export shipments of fresh Northeast Arctic cod (*Gadus morhua*)

Miguel Bao *, Paolo Cipriani, Lucilla Giulietti, Natalia Drivenes, Arne Levsen

Section of Contaminants and Biohazards. Institute of Marine Research (IMR), PO Box, 1870 Nordnes, N-5817 Bergen, Norway

Application of Standardized EURLP Methodologies in the Surveillance of Parasites in Important Wild Fish Species in Norway

Surveillance program (started in 2012)

In 2025:

Brosme brosme (n = 60)

Gadus morhua (n = 30)

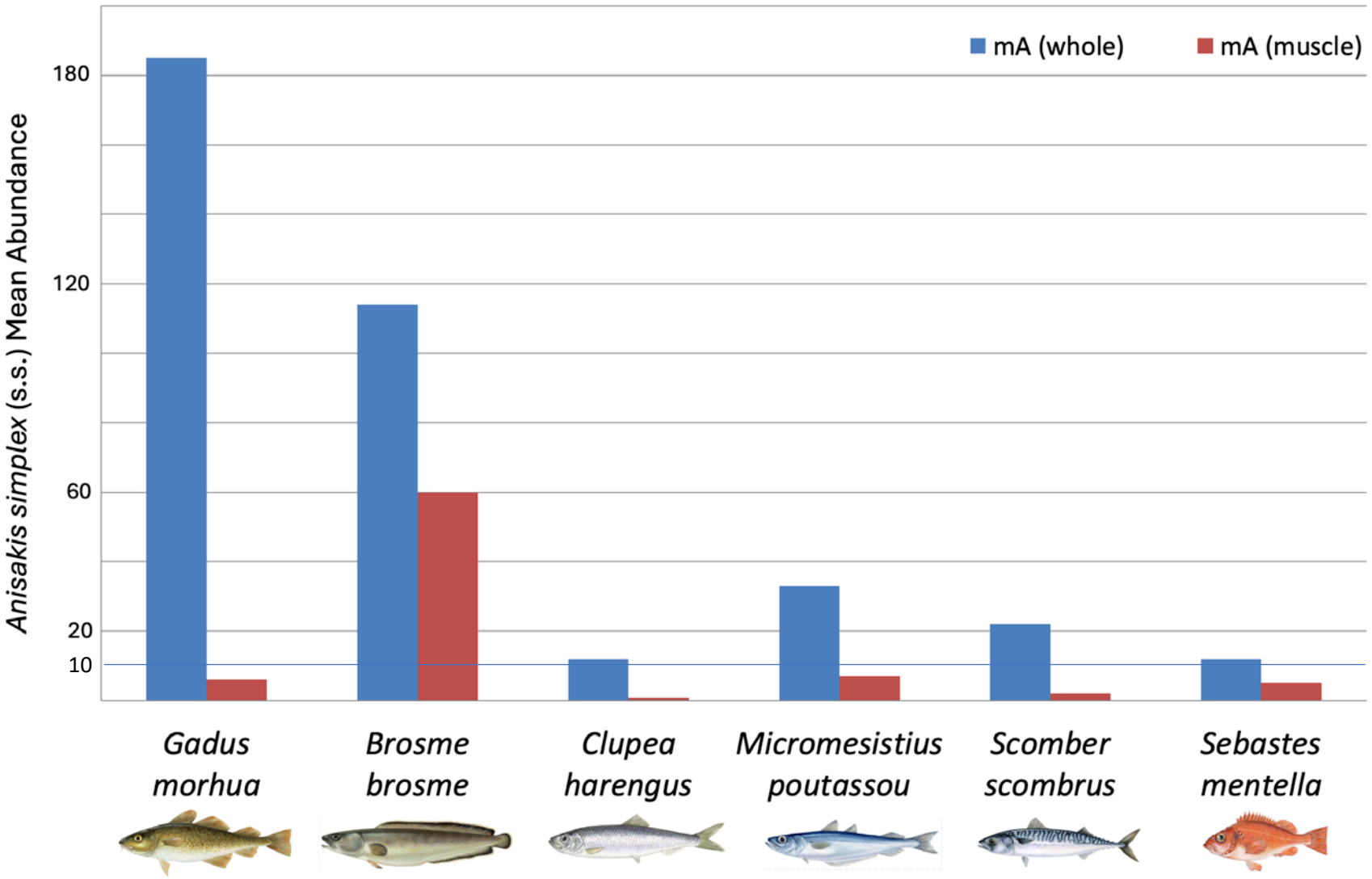
Clupea harengus (n = 150)

Scomber scombrus (n = 100)

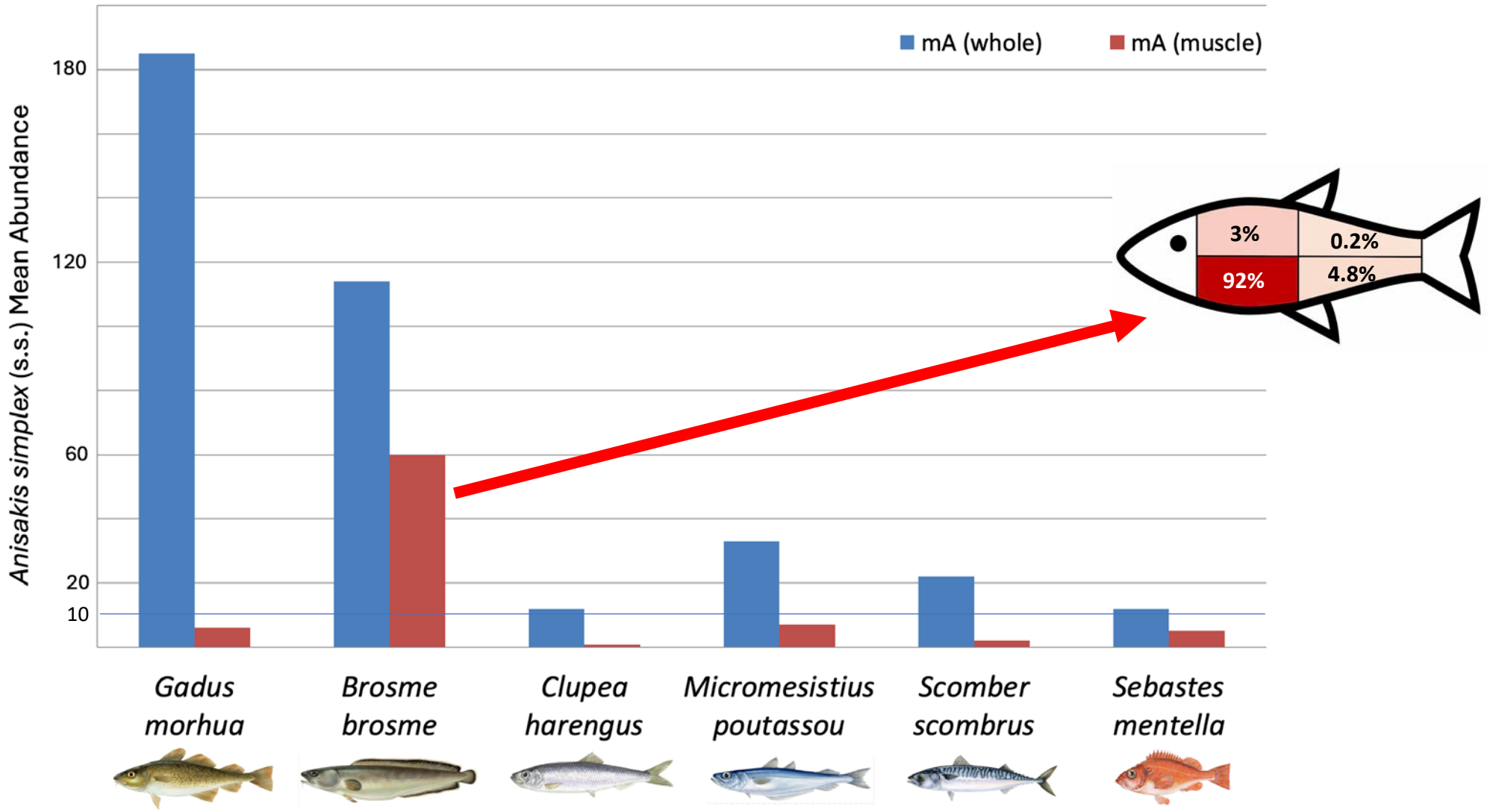
Micromesistius poutassou (n= 130)

Sebastes mentella (n= 40)

Mean Abundance of *Anisakis simplex* (s.s.)

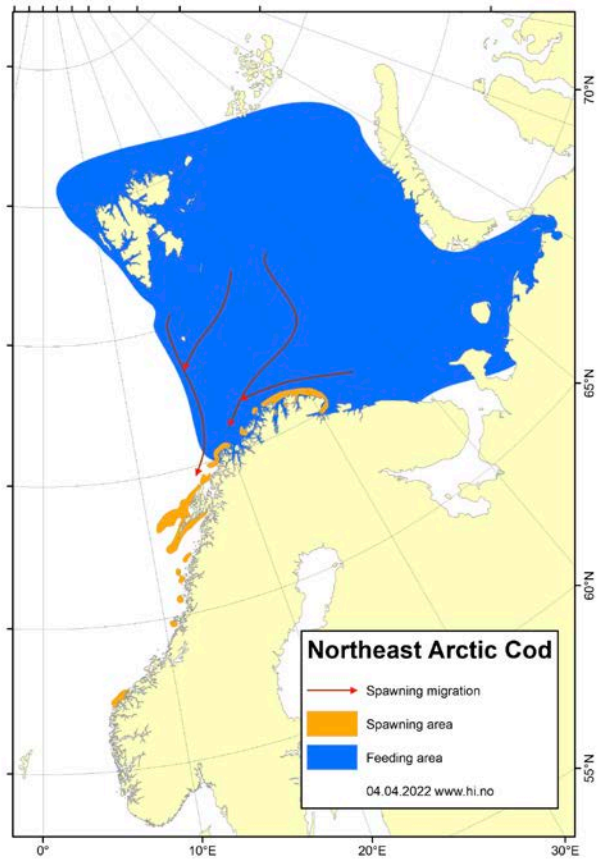


Mean Abundance of *Anisakis simplex* (s.s.)



Case study:

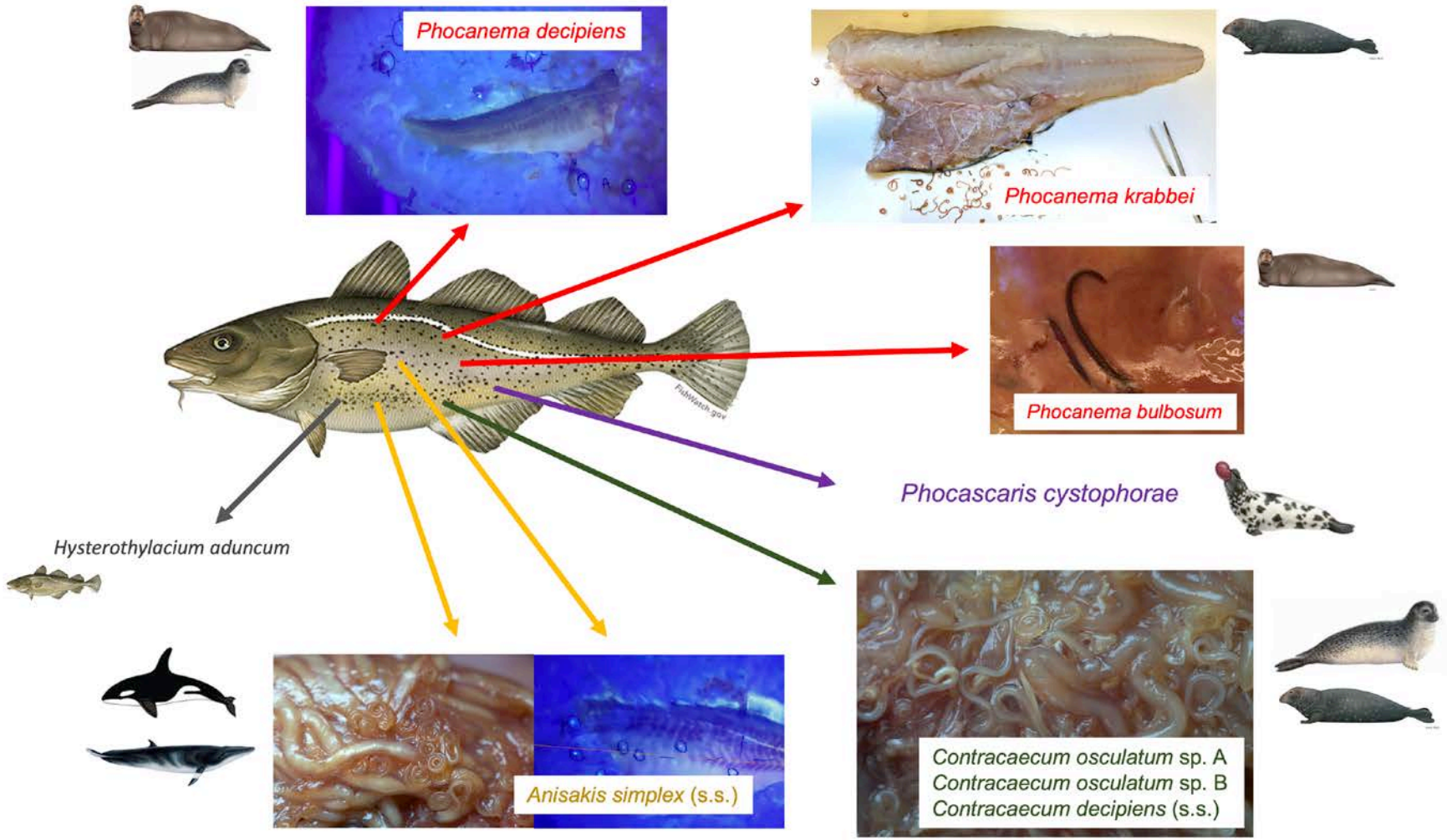
30 specimens of North East Arctic cod (*Gadus morhua*) fished around Lofoten Islands



Commercial size fish (from 2 to10 Kg)

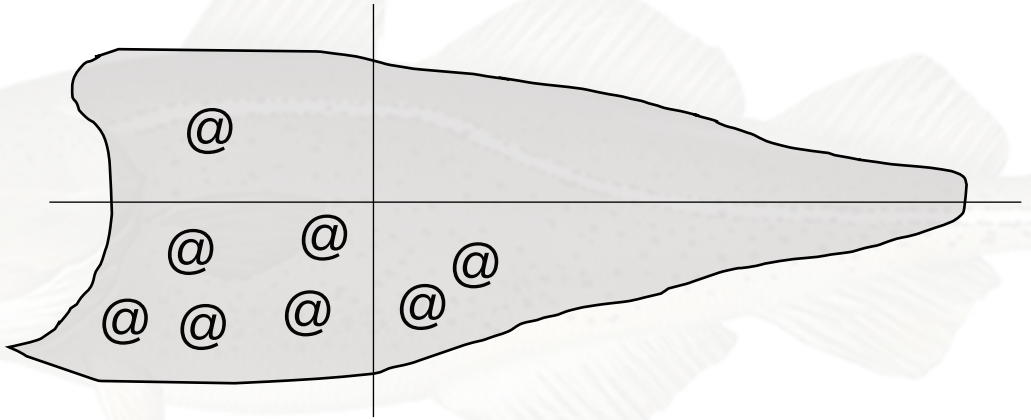
“Molecular identification of anisakid nematodes at the species level”

A huge Anisakids Biodiversity (9 species)!

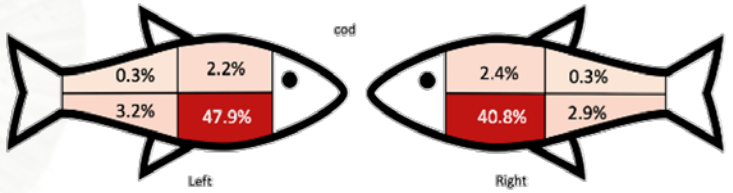


A. simplex (s.s.)

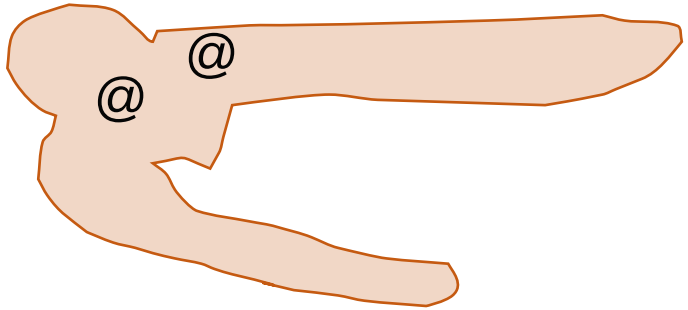
Flesh (6.5%)

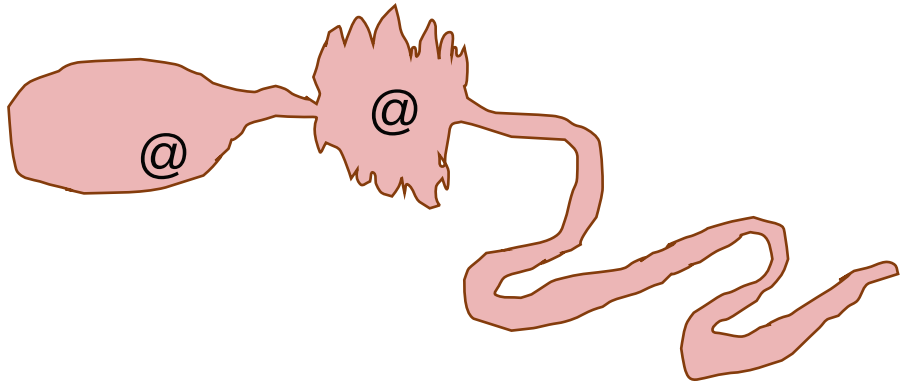


Distribution of larvae in flesh



Liver (27%)





Stomach wall, pyloric caeca, intestine (66,5%)

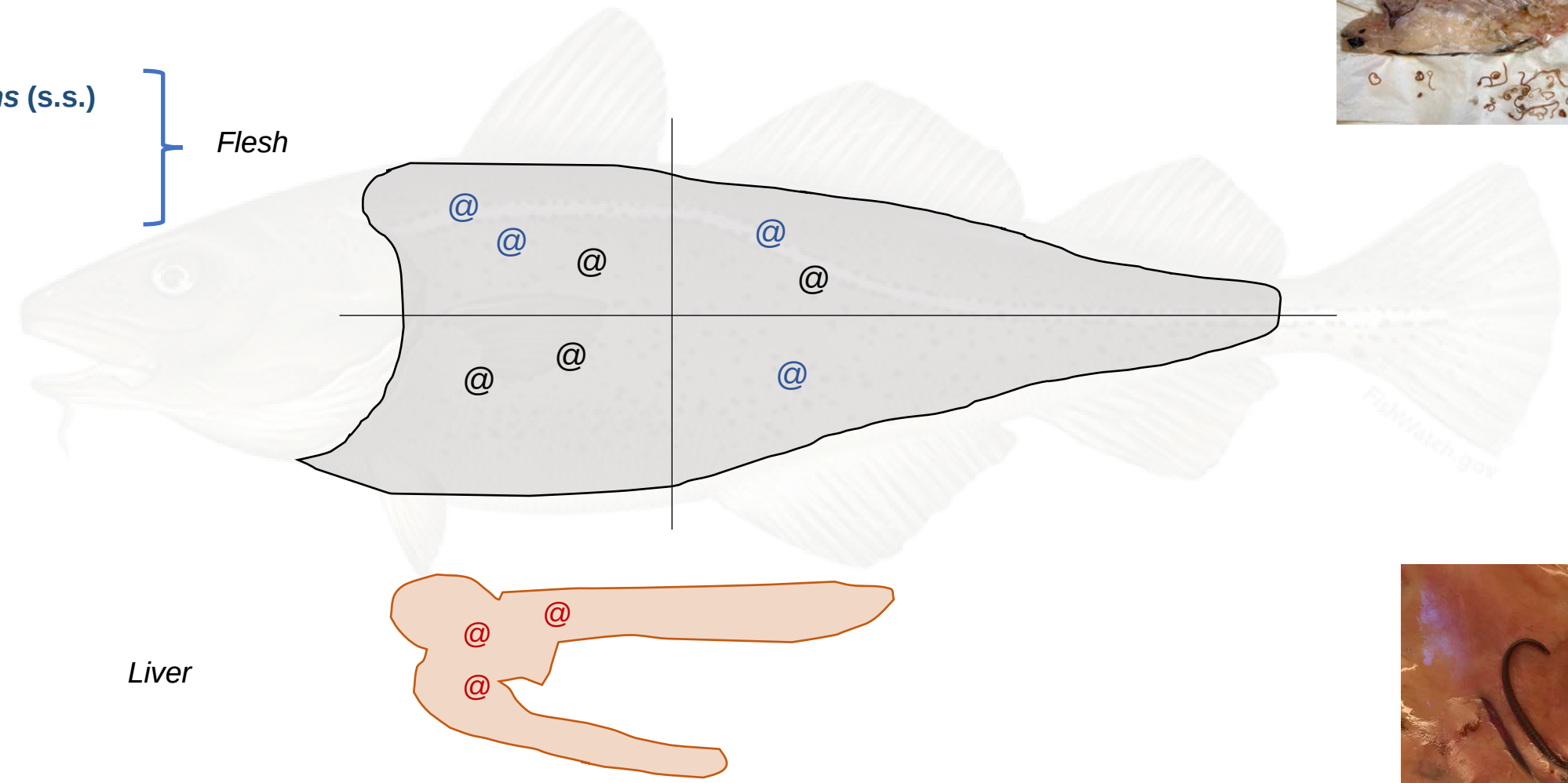
Differential species distribution within the fish host

***Phocanema* spp.**

***P. decipiens* (s.s.)**

P. krabbei

Flesh



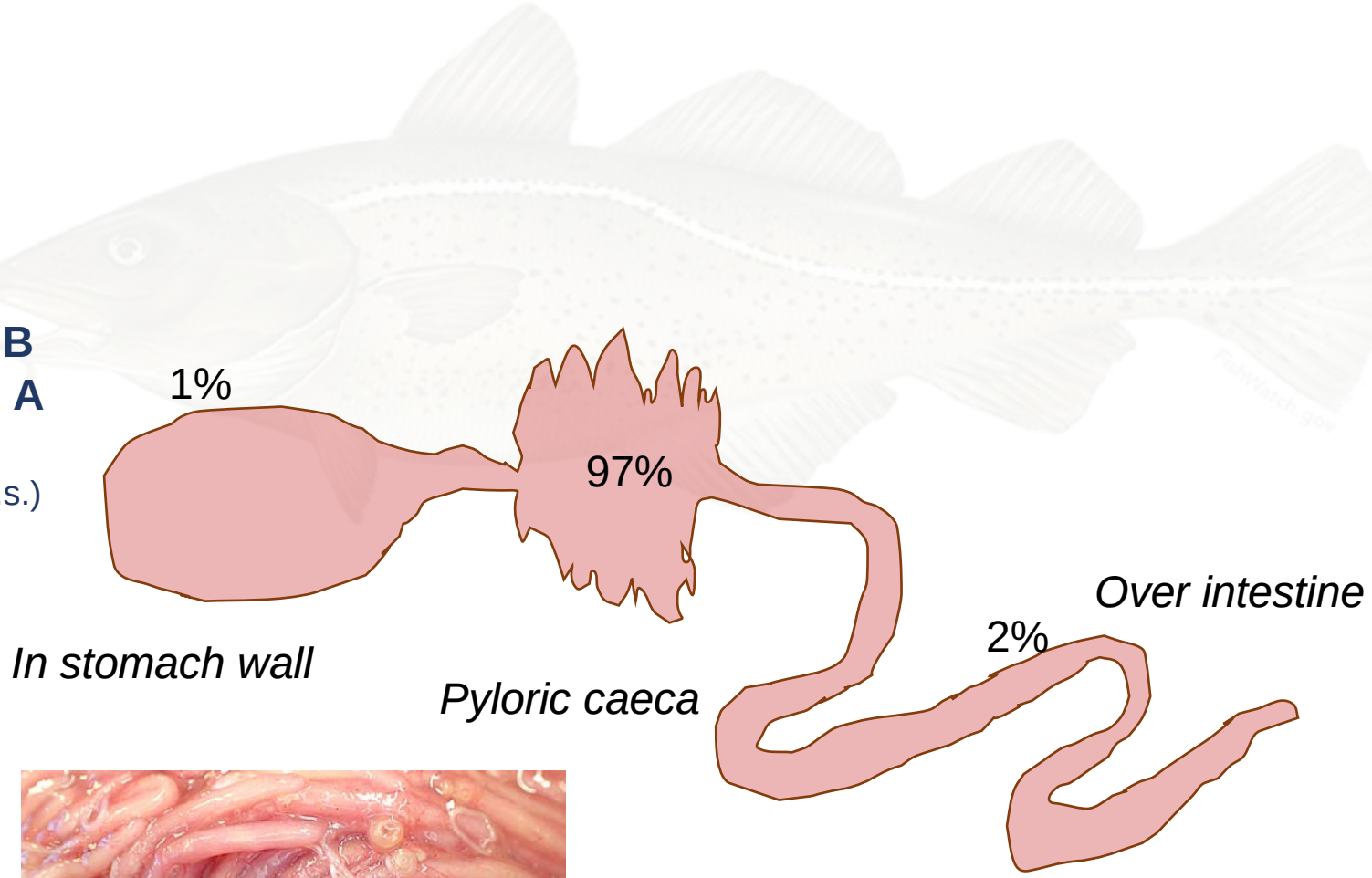
P. bulbosa

Liver

Contracaecum spp.

C. osculatum sp.B
C. osculatum sp. A

(rarely *C. osculatum* (s.s.) *and Ph. cystophorae*)



Hysterothylacium aduncum

Food Control 121 (2021) 107724

Contents lists available at ScienceDirect

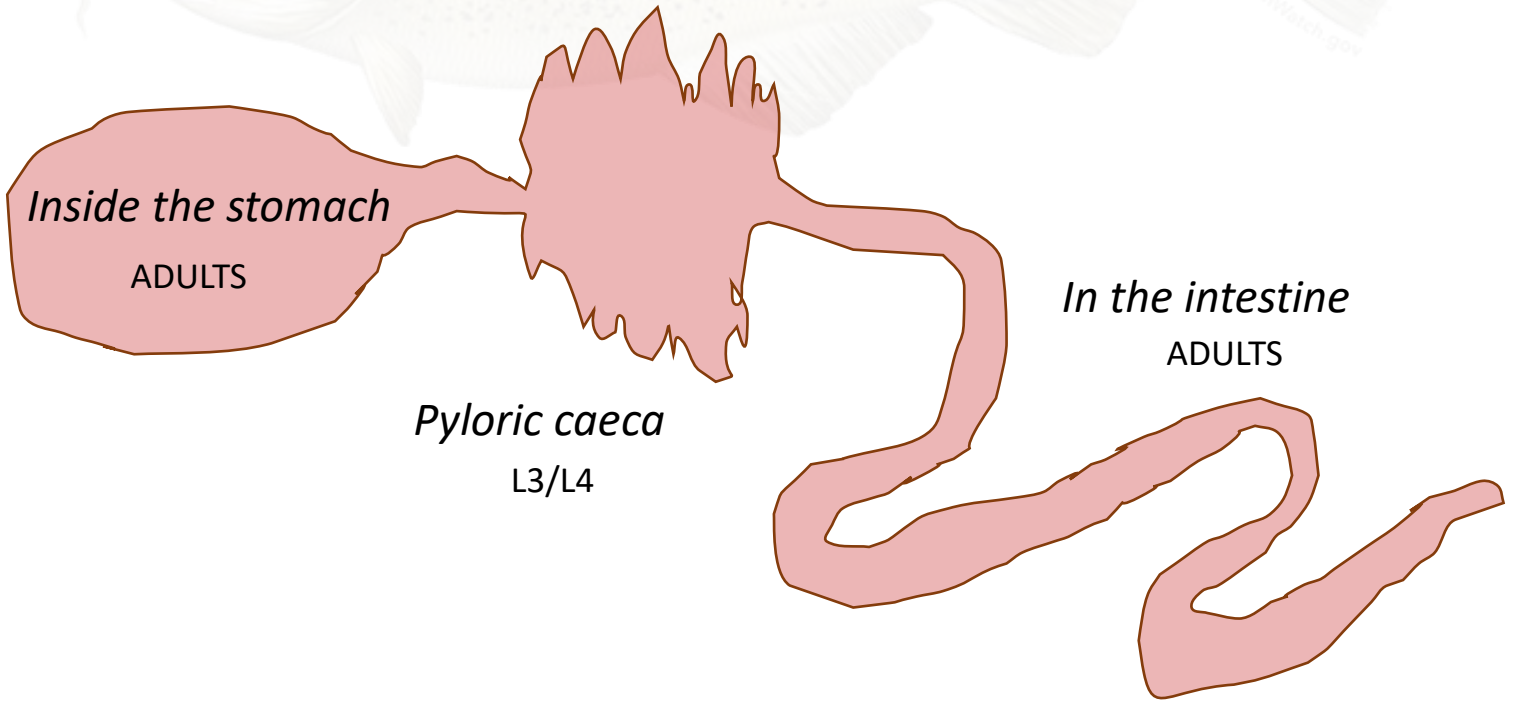
Food Control

journal homepage: www.elsevier.com/locate/foodcont

Quality issues related to the presence of the fish parasitic nematode *Hysterothylacium aduncum* in export shipments of fresh Northeast Arctic cod (*Gadus morhua*)

Miguel Bao *, Paolo Cipriani, Lucilla Giulietti, Natalia Drivenes, Arne Levsen

Section of Contaminants and Biohazards. Institute of Marine Research (IMR), PO Box, 1870 Nordnes, N-5817 Bergen, Norway



Latest on Seafood quality

Monitoring programme on the soft flesh-parasite *Kudoa*: quality reducing parasite

Parasite-induc ('soft flesh'):
completely di

Detrimen oduct

Thanks for your attention