



FHF prosjekt nr. 901628
Kartlegge forekomst av kveis i hvitfisk i norske farvann gjennom året



Mapping the presence of ascaridoid nematodes in whitefish species from Norwegian waters throughout the year



«Kveis»

(nematode parasites infecting fish products)

➔ **Parasites.** Their presence in fish has an *heavy impact for the fishing industry*

➔ Their presence could be rarely dangerous, but surely it generates distrust in consumers



«Kveis»

(scientifically *ascaridoids nematodes*, or anisakids)

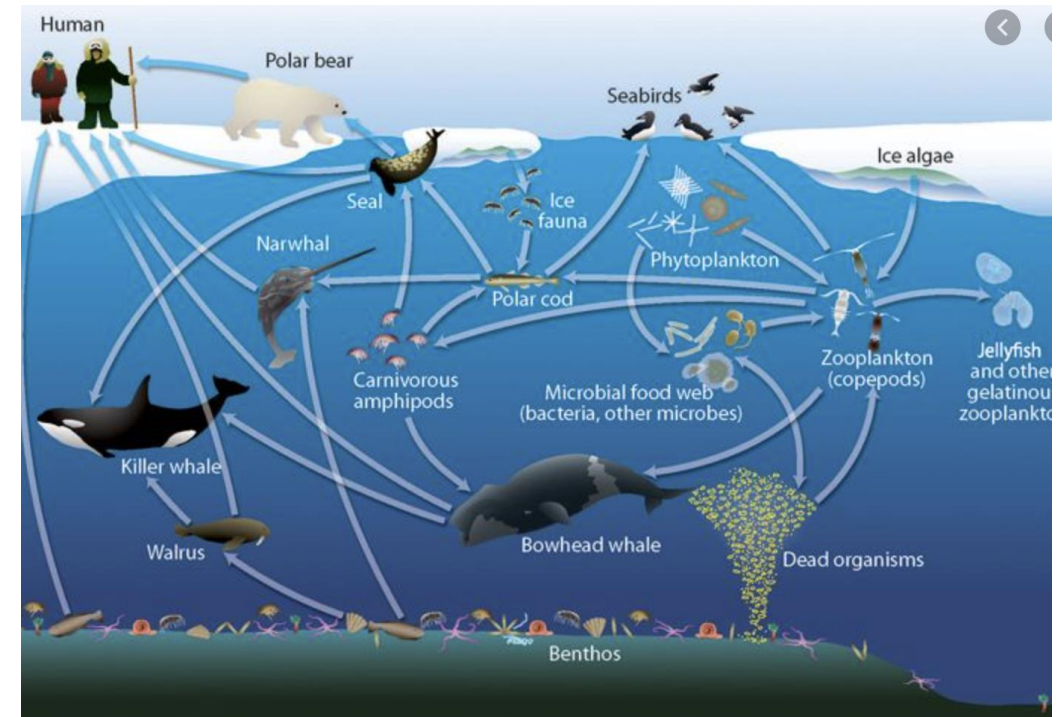


«parasitism is the most popular lifestyle on Earth»

“the scientific-point-of-view paradox” of anisakids:



«A healthy marine ecosystem is one with high level of infections by anisakid nematodes»



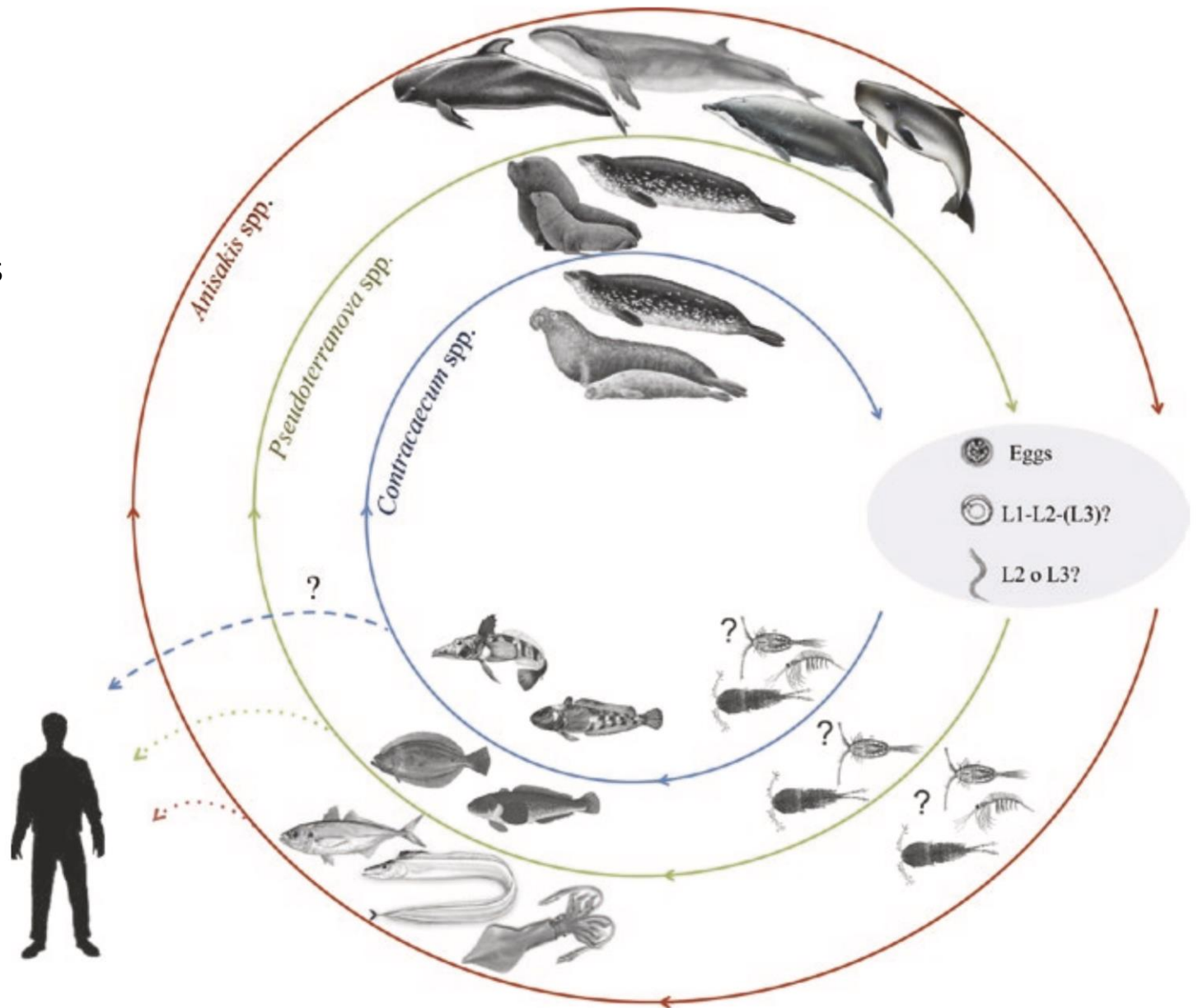
«Kveis»

Anisakis spp.
Pseudoterranova spp.
Contracaecum spp. } marine mammals
parasites

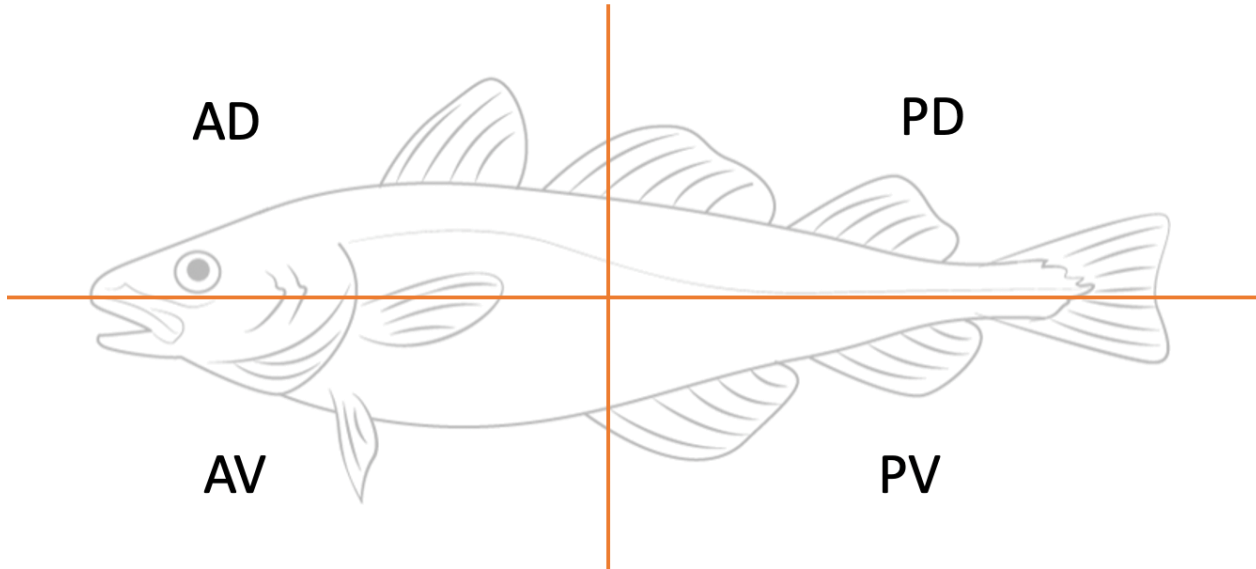
Can migrate to fish flesh
Potentially zoonotic

Hysterothylacium spp.
fish parasites

Only in fish viscera
Not zoonotic

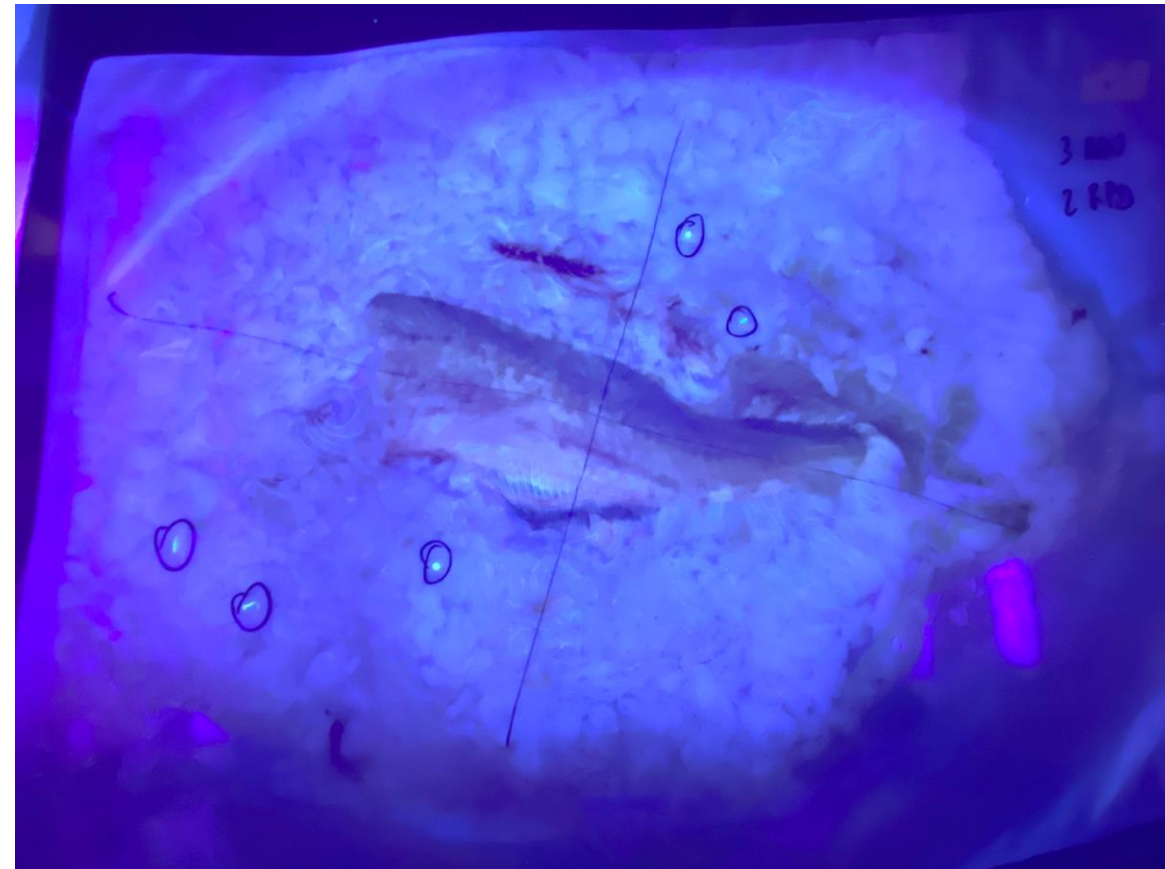


We focused on fish flesh, inspected by **press-UV inspection method**



It permits an exact localization of larvae in the fish host

Press-UV is much more efficient than candling on light table

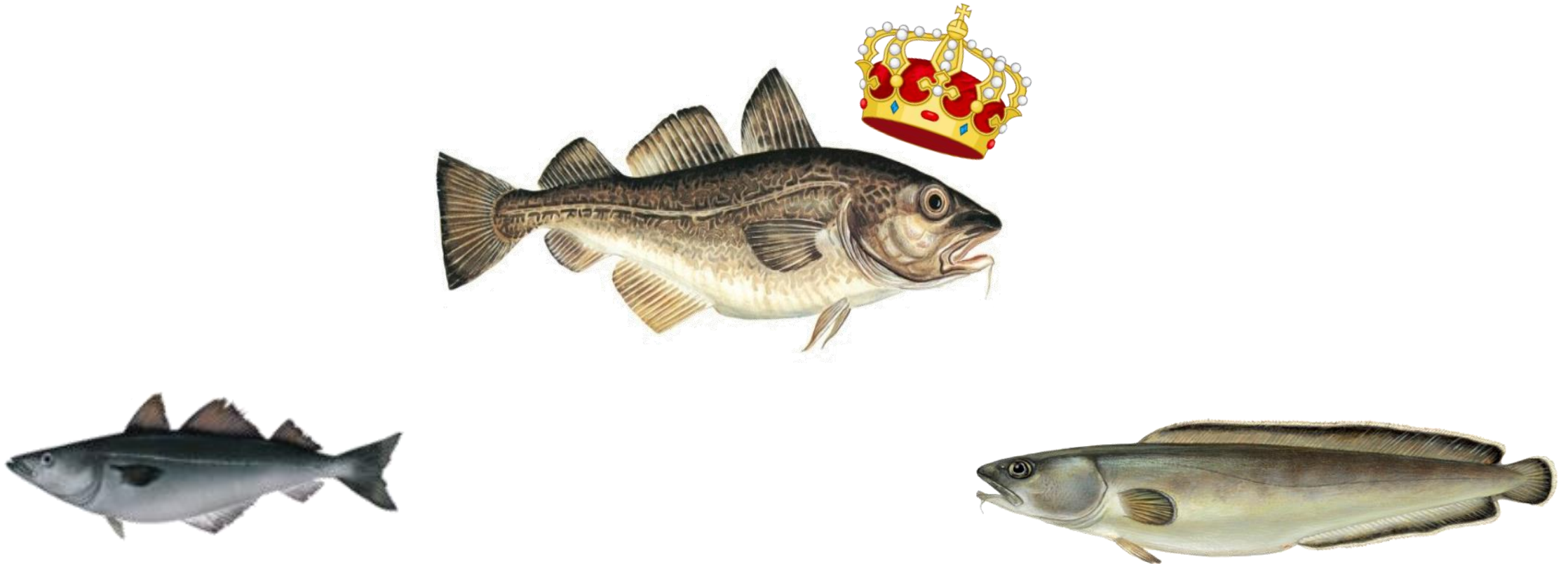




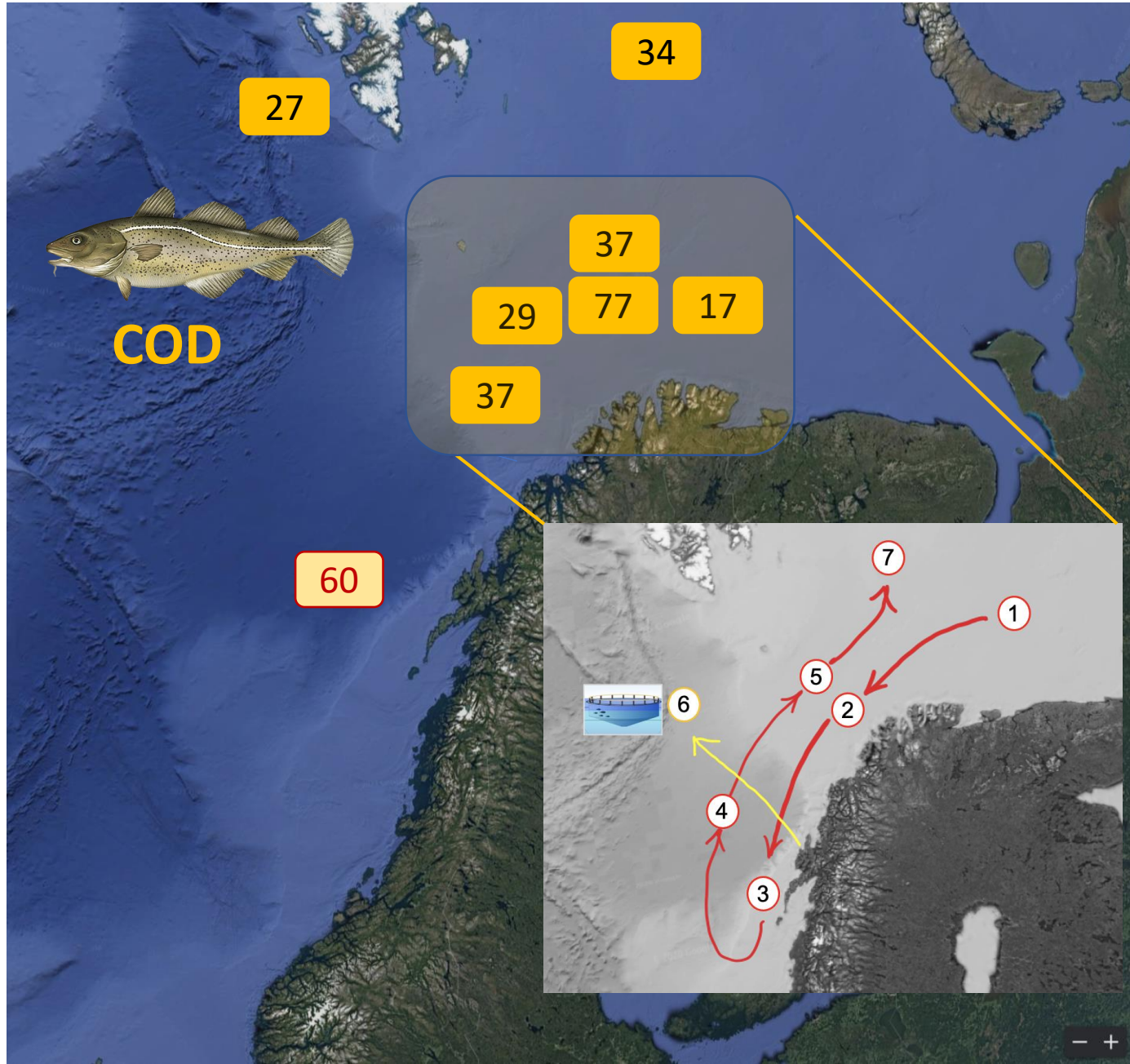
FHF prosjekt nr. 901628
*Kartlegge forekomst av kveis i hvitfisk i norske farvann
gjennom året*



*Mapping the occurrence of ascaridoid nematodes in **whitefish species** from Norwegian waters throughout the year*

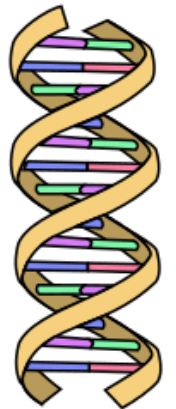
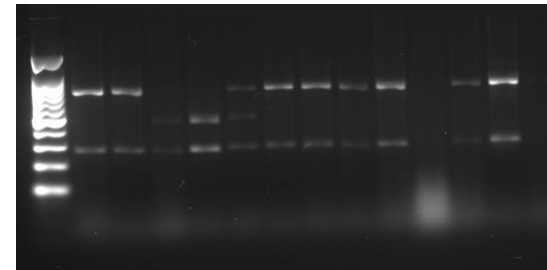


The SAMPLING PLAN



318 specimens of *Gadus morhua* (cod) sampled in different seasons

Skrei and Coastal cod stocks discriminated by genetic molecular analyses





SAITHE

117 specimens
of *Pollachius virens*

60

30

27



BROSME

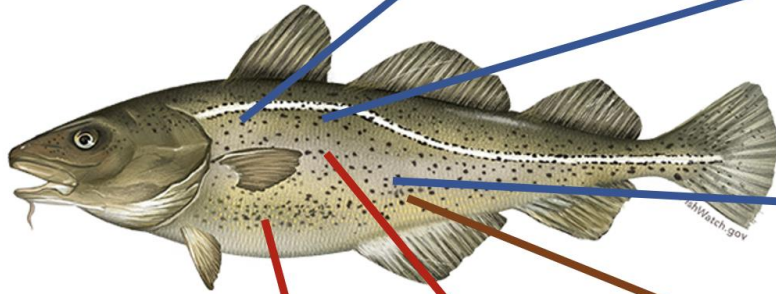
71 specimens
of *Brosme brosme*

31

8

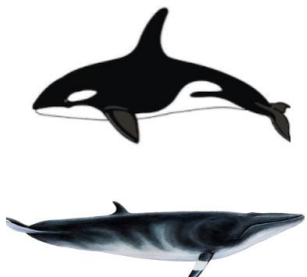
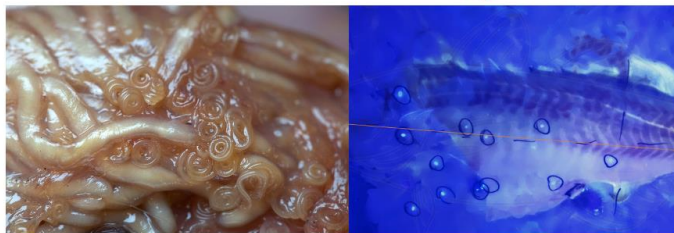
32

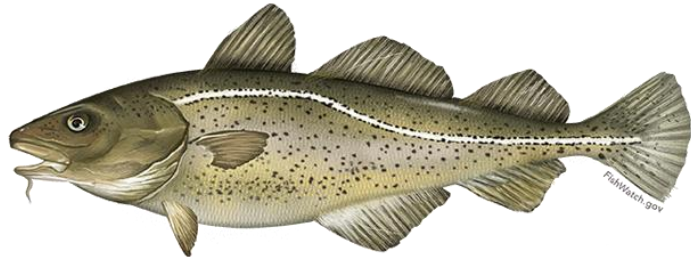
RESULTS OVERVIEW: ANISAKIDS BIODIVERSITY



Anisakis simplex (s.s.)

Contracaecum spp.





Finnmark
77 fish (Feb→May)
Mean Length: 80 cm
Mean Weight: 5 Kg

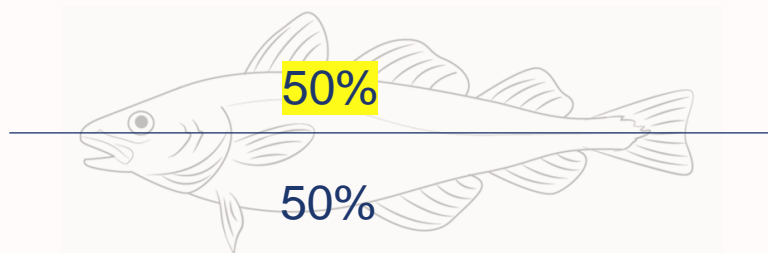
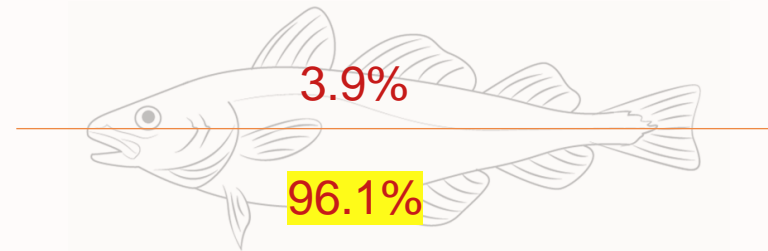
Commercial size fish
100% SKREI
(genetical ID) 

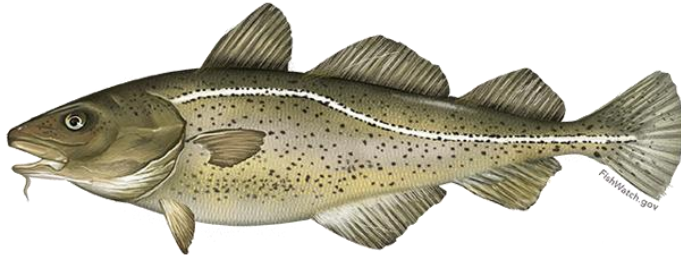
Anisakis simplex (s.s.)
Flesh P=96% ml: 14

Pseudoterranova
krabbei and P. decipiens
Flesh P=22% ml: 4

Contracaecum
osculatum sp.B
Flesh 1% ml: 0,2

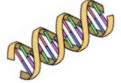
Localization of larvae in the fish flesh





Lofoten sample Mar 2021
60 fish
Mean L: 75 cm
Mean W: 4.7 Kg

COASTAL COD!!

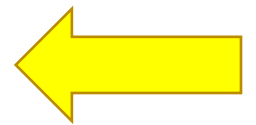
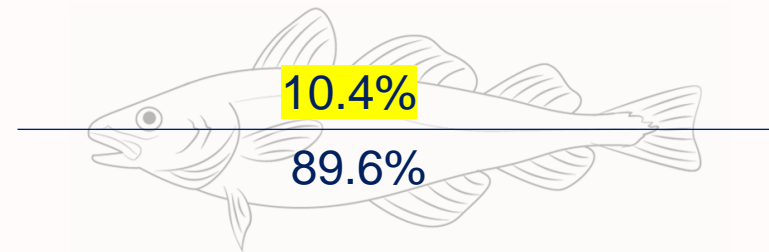
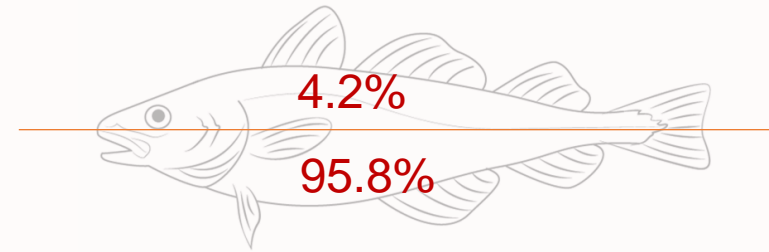
(genetical ID) 

Anisakis simplex (s.s.)
Flesh P=78.3% ml: 8.55

**Pseudoterranova krabbei and
P. decipiens**
Flesh P=63.3% ml: 30.8

Contracaecum osculatum sp.B
Flesh 2% ml: 0.5

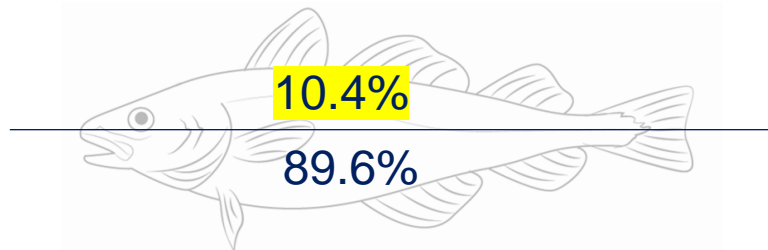
Localization of larvae in the fish flesh





***Pseudoterranova krabbei*
& *P. decipiens***

Flesh 63.3% ml: 30.8



The importance of parasite species identification!



Pseudoterranova krabbei



Main definitive host:

Grey seal



Adult Male

Abundant in Lofoten coastal area!



Brosme – Off Bergen - BBBGA

32 fish

Mean L: 74 cm

Mean W: 4.5 kg

Anisakis simplex (s.s.)

Flesh P=100% ml: 65

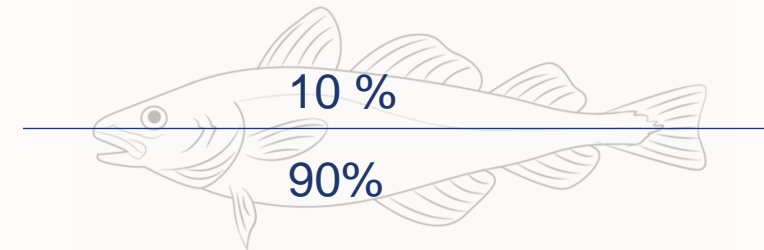
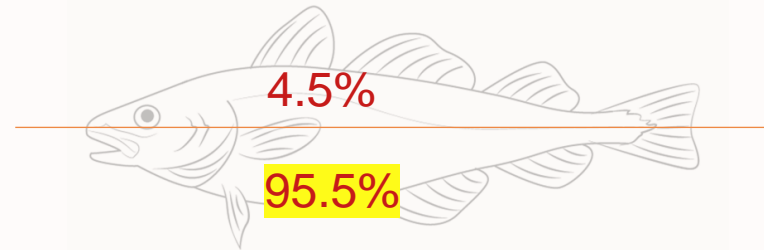
Pseudoterranova krabbei and *P. decipiens*

Flesh P=30% ml: 1.4

Contracaecum *osculatum* sp.B

Flesh 0% ml: 0

Localization of larvae in the fish flesh

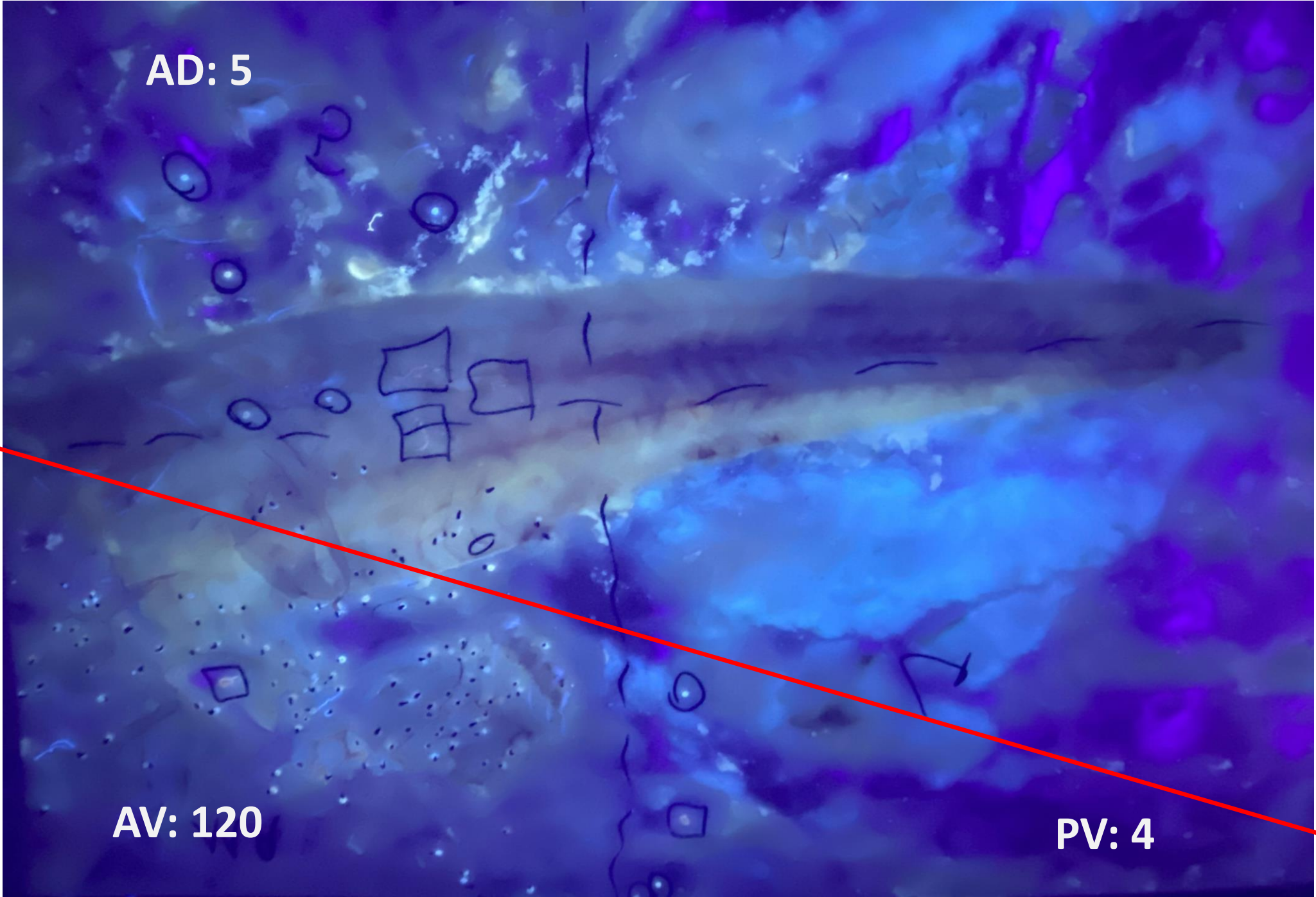
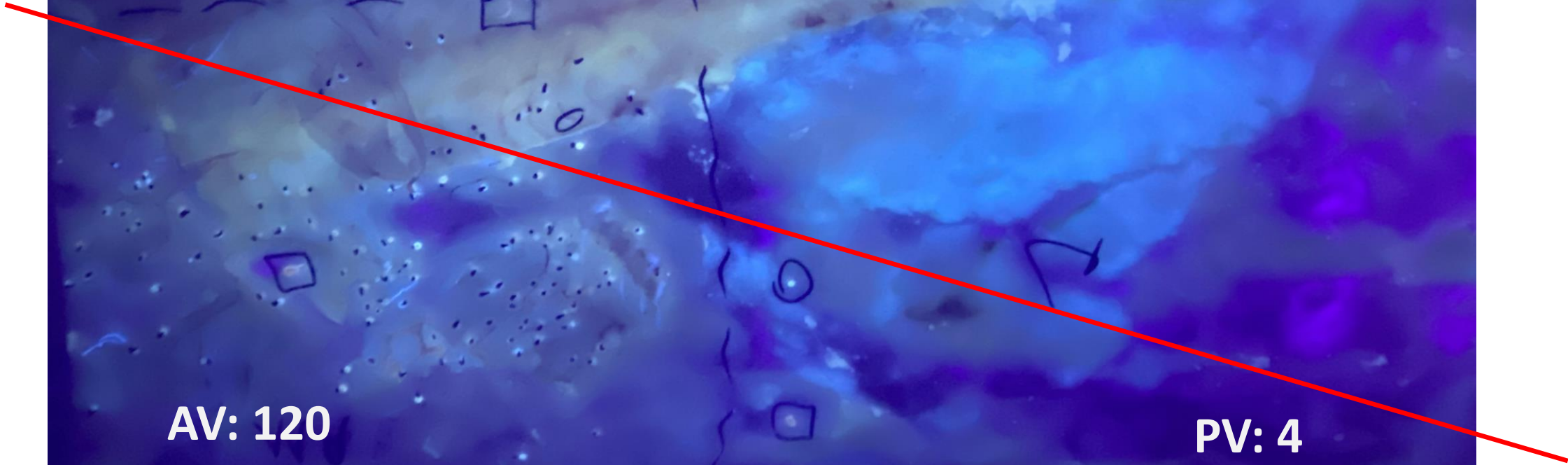


AD: 5

BRSM

AV: 120

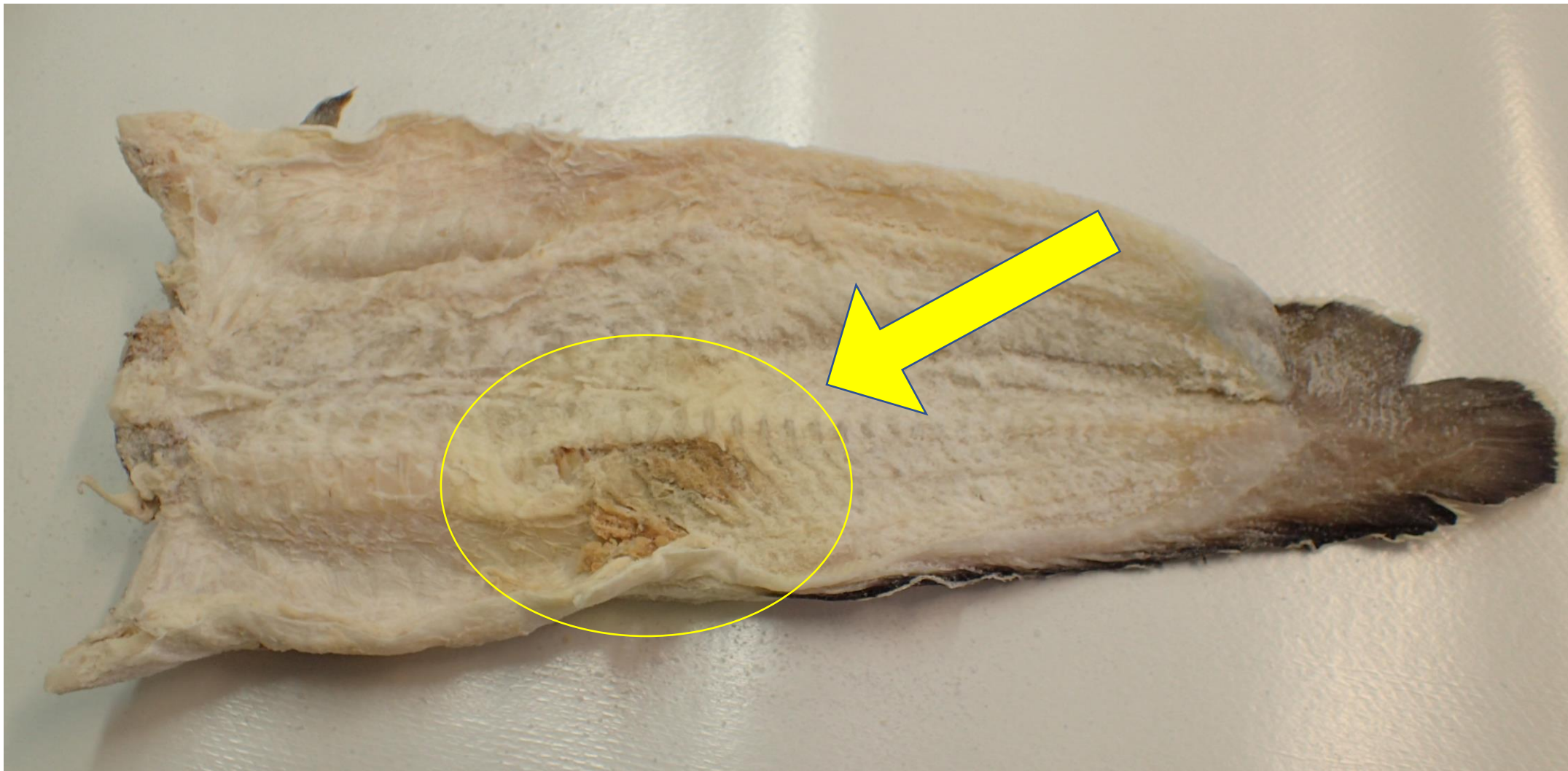
PV: 4





Anisakis larvae clusters

Klipfisk made from brosmie rejected **for visible larvae!**



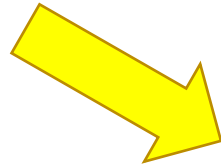
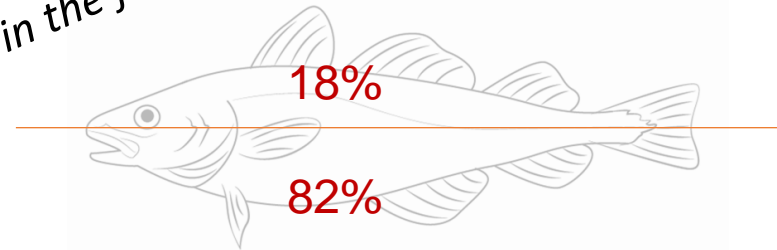


Saithe – Norwegian Sea Oct 2020
30 fish
Mean L: 49 cm
Mean W: 1 Kg

***Anisakis simplex* (s.s.)**

Flesh P=100% ml: 9.2

Localization of larvae in the fish flesh

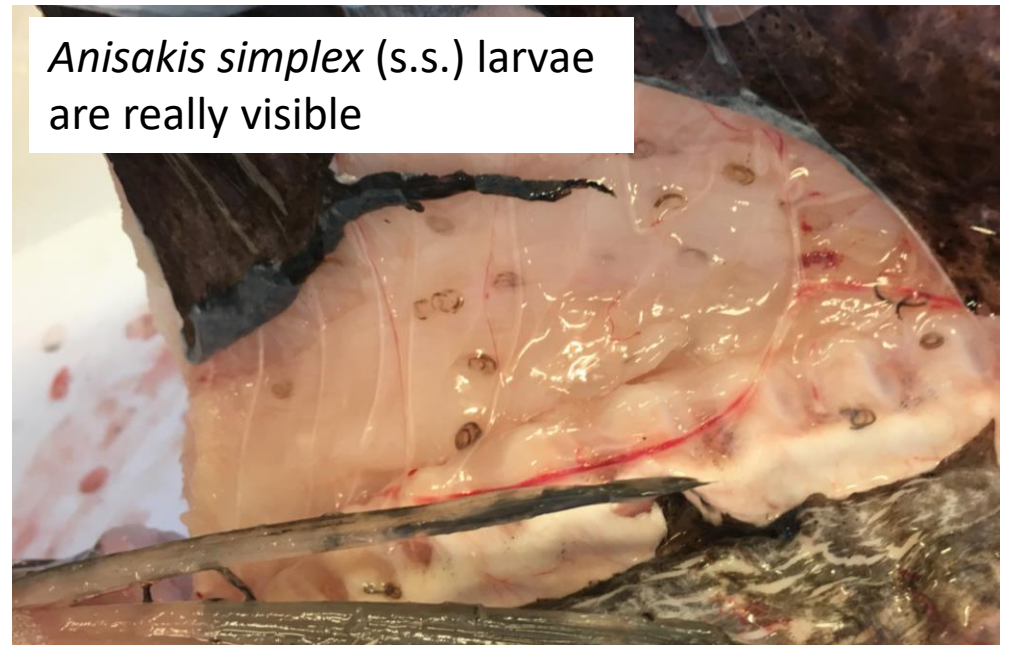


Pseudoterranova krabbei

Only 1 larva found in ventral muscle

***Contracaecum osculatum* sp.B**

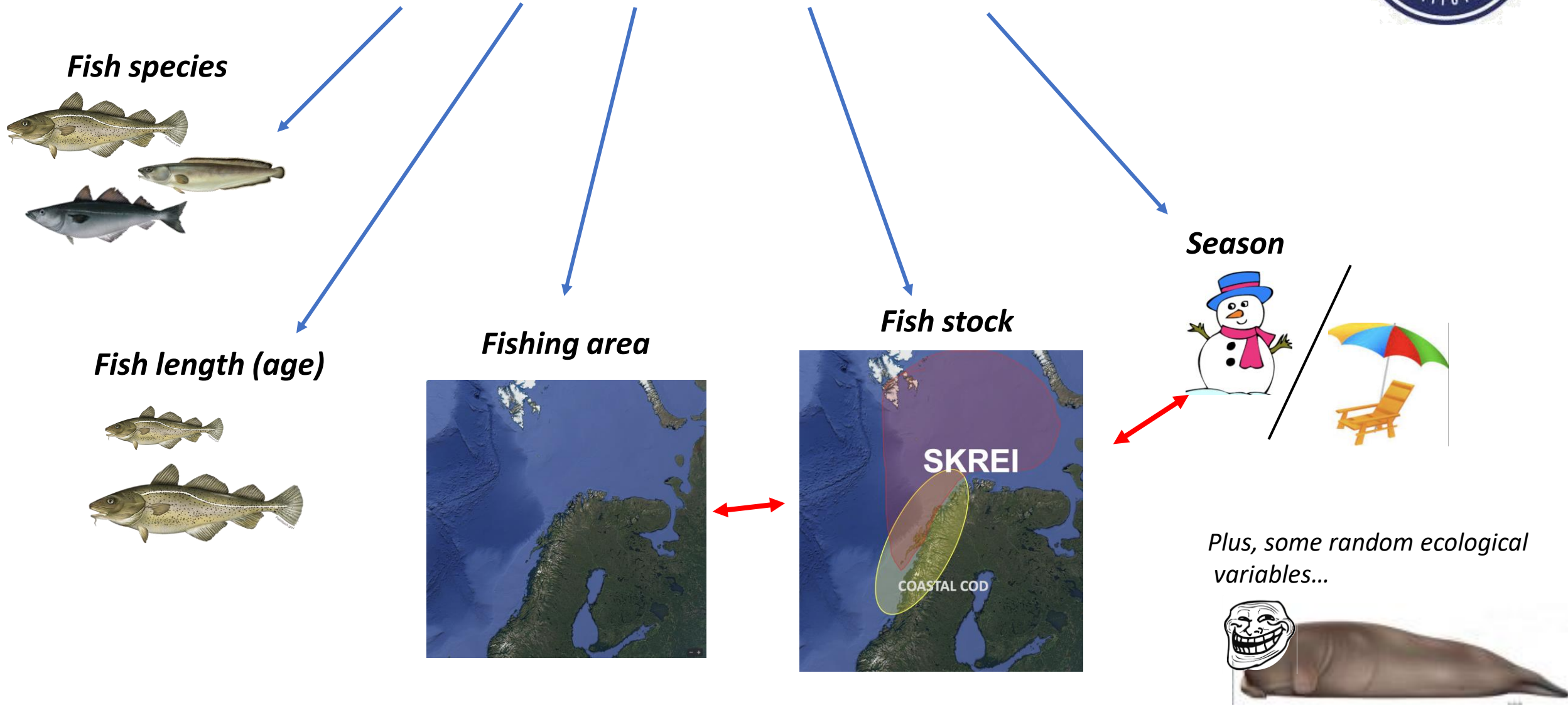
Flesh 0% ml: 0



Conclusions:



Major *drivers* determining presence of Kveis in whitefish



Best practice perspectives:

We cannot get rid of KVEIS from our ecosystems, but we can reduce their impact in seafood



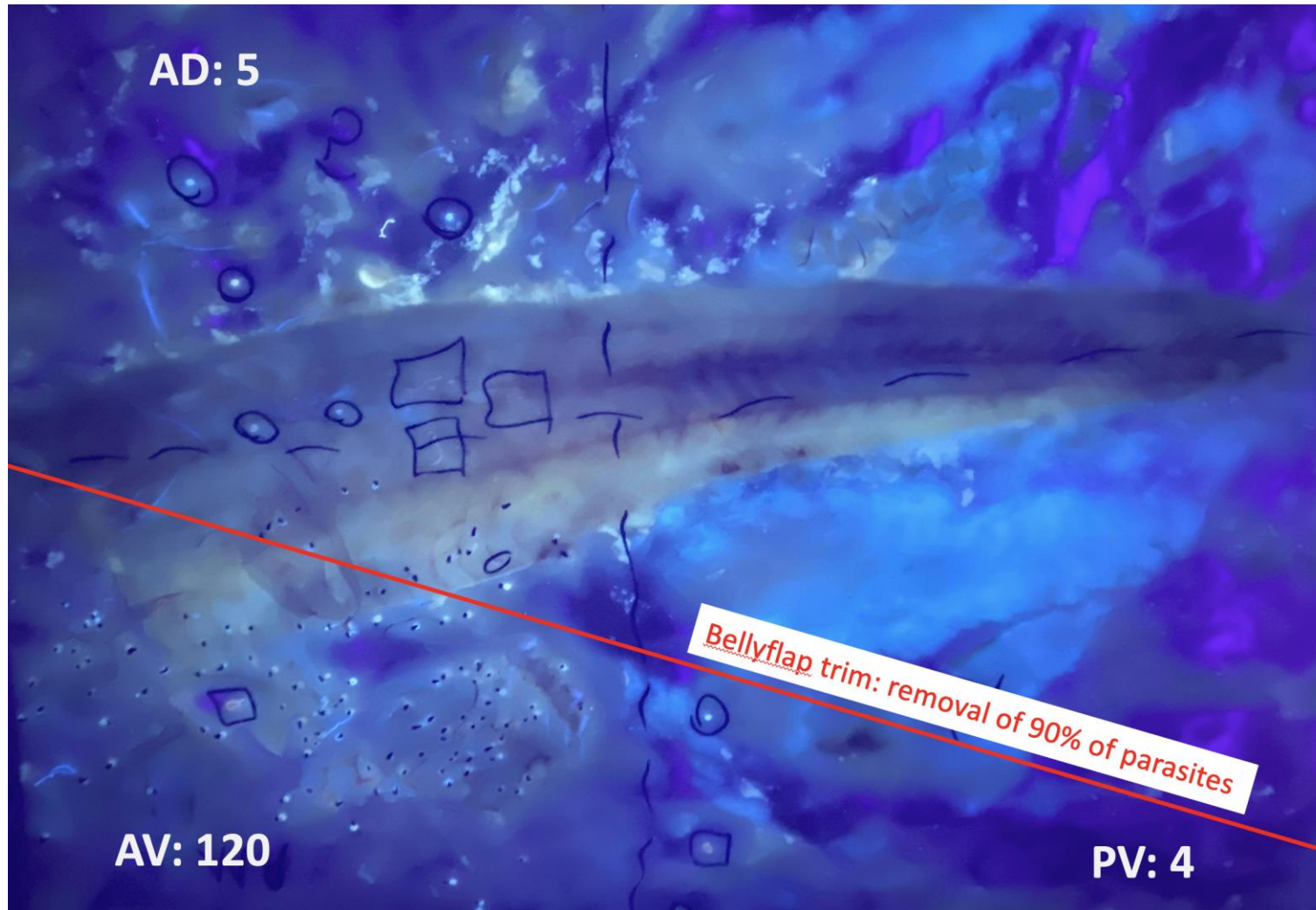
Keep on acquiring more data and knowledge.

Knowing hosts/parasite dynamics allows PREVENTION measures.

Dissemination activities of best procedures, consumers awareness, and education on fish consumption (the common rules of fish freezing/cooking)

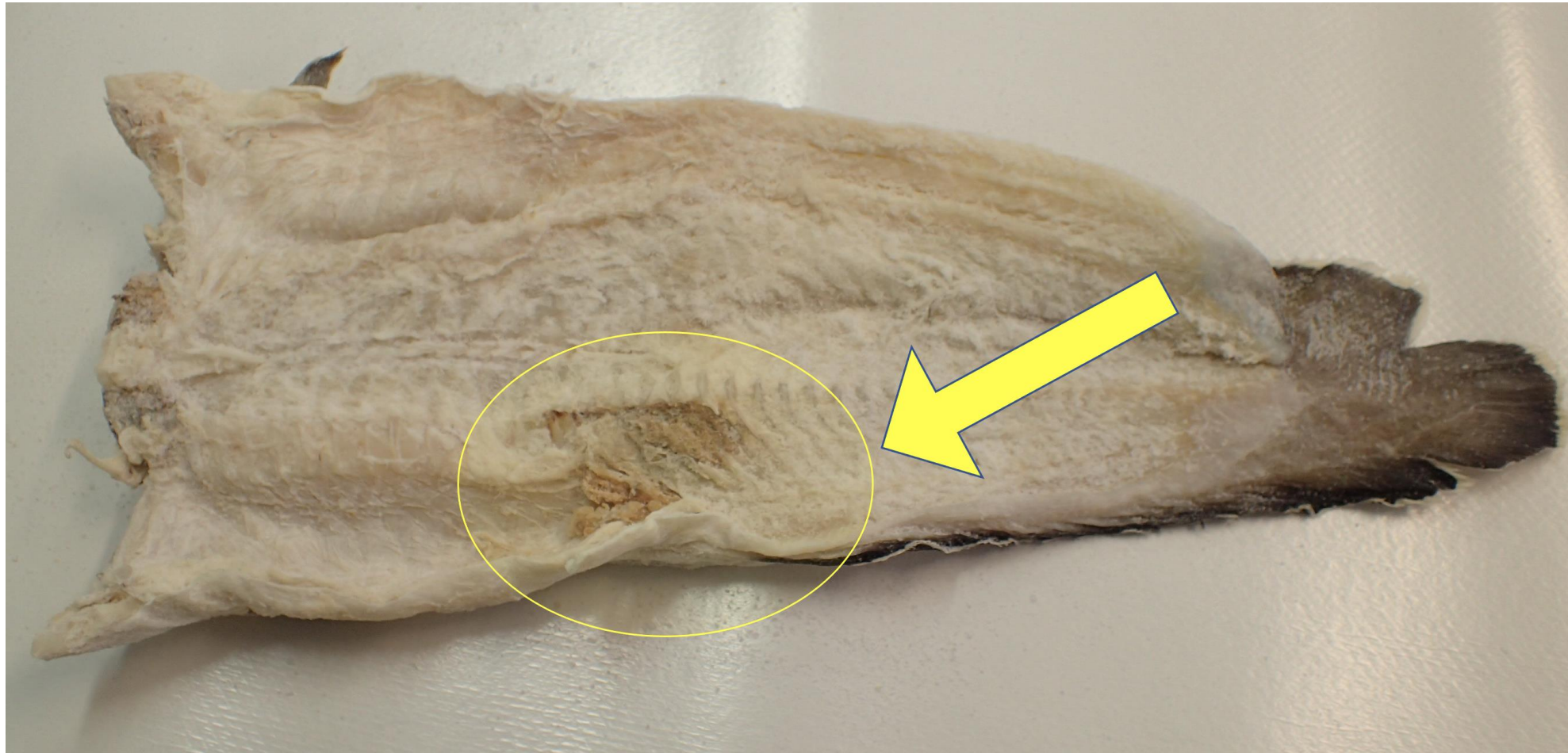
Simple implementations measures to lower parasites presence in seafood products:

Trim the bellyflap of fish with evident presence of parasitic nematodes!!



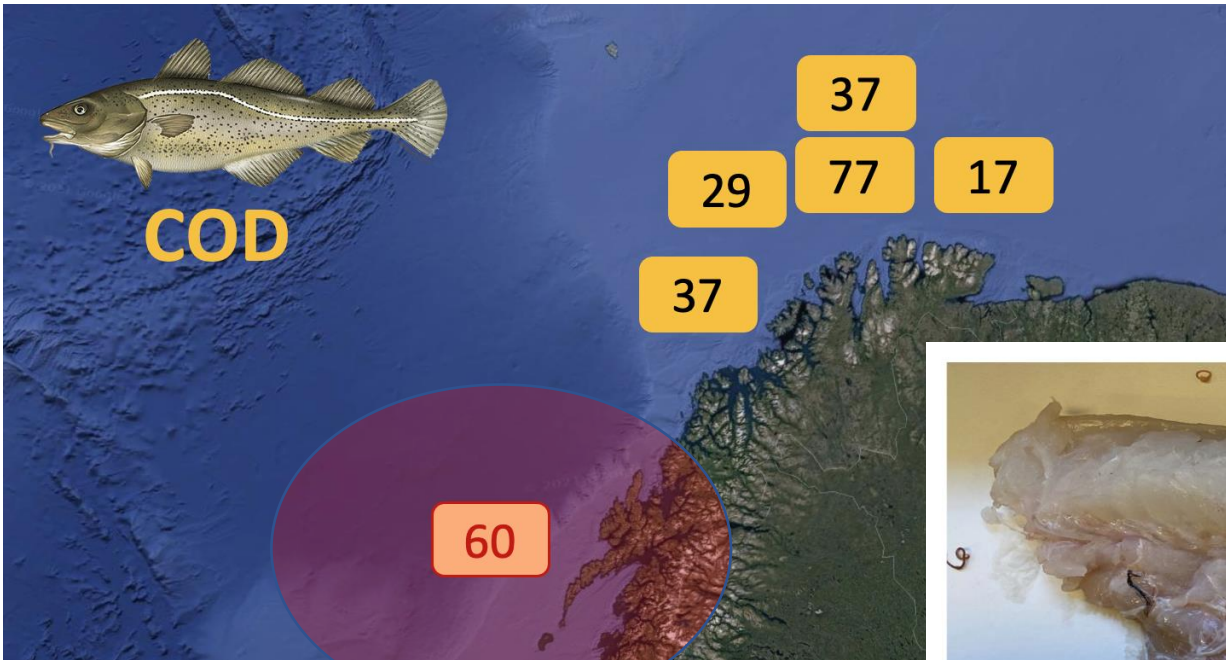
Simple implementations measures to lower parasites presence in seafood products:

Dedicate extra time on fishing evisceration/cleaning during fish processing



Simple implementations measures to lower parasites presence in seafood products:

Avoid to fish in certain areas in determined seasons



Costal COD in skrei season!



Pseudoterranova krabbei



Main definitive host:



Grey seal

Abuntant in Lofoten coastal area!



Tusen takk.

