REPORT ON THE MONITORING PROGRAMME FOR THE PRESENCE OF VISIBLE PARASITES IN FISH (2025)

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Summary (English):

The monitoring programme for visible parasites in wild-catch fishery products from Norwegian processing plants in 2025 showed that approximately one third of 321 examined products contained visible parasites, and that around one fifth were obviously contaminated. The most important parasites were zoonotic roundworms in the anisakid family, especially *Anisakis* sp. and *Phocanema* sp., in the body cavity and fillets, as well as the trematode parasite *Cryptocotyle lingua* in the skin. Cod, tusk and saithe showed highest occurrence, while no visible parasites were found in Greenland halibut and mackerel. Most cases of obviously contaminated products could have been avoided through better cleaning, including removal of visceral remains and final control practices in plants.

Summary (Norwegian):

Overvåkingsprogrammet for synlige parasitter i villfiskprodukter fra norske anlegg i 2025 viste at omtrent en tredel av de 321 undersøkte produktene inneholdt synlige parasitter, og at rundt en femtedel var åpenbart kontaminerte. De viktigste parasittene var zoonotiske rundormer i anisakidfamilien (særlig *Anisakis* sp. og *Phocanema* sp.) i bukhule og filet, samt ikten *Cryptocotyle lingua* i huden. Torsk, brosme og sei hadde høyest forekomst, mens det ikke ble funnet synlige parasitter i blåkveite og makrell. De fleste tydelig kontaminerte produktene kunne vært unngått ved grundigere rensing av bukhulen for innvollsrester samt bedre sluttkontrollrutiner i bedriftene.

Content

1 - Introduction

Parasites including nematodes (roundworms), cestodes (tapeworms) and trematodes (flukes), are natural and integral components of marine ecosystems. Some parasites of fish are typically more abundant and diverse than their hosts. Hence, in important commercially harvested fish species such as Atlantic cod, saithe and herring, potentially zoonotic nematodes within the anisakid family commonly occur. The EFSA Panel on Biological Hazards has concluded that no wild marine fish species from any fishing ground can be considered free of parasites of public health importance (EFSA BIOHAZ Panel et al., 2024a). Because visible parasites negatively affect food safety and consumer perception, food business operators (FBOs) are required to ensure appropriate evisceration, cleaning and visual inspection, including, where relevant, the manual removal of visible parasites from fillets by candling and/or trimming prior to marketing.

Under Regulation (EC) No 853/2004, FBOs must ensure that fishery products have been subjected to a visual examination for the purpose of detecting visible parasites and must not place fishery products that are obviously contaminated with parasites on the market for human consumption. Detailed rules for visual inspection to detect parasites in fishery products are given in Regulation (EC) No 2074/2005. In addition, Regulation (EU) No 2019/627 lays down practical arrangements for the performance of official controls on products of animal origin intended for human consumption including fishery products, to be performed by the competent authority or delegated bodies.

The present monitoring and control program on parasites, run by the Institute of Marine Research of Bergen on behalf of the Norwegian Food Safety Authority, aimed to verify that the visual examination procedures by Norwegian seafood companies are in compliance with the above-mentioned regulations.

2 - Methods

A total of 321 fishery products (mostly head-off and eviscerated fish) were randomly collected by various Norwegian Food Safety Authority inspectors from 19 wild-catch fish processing plants across Norway during 2025 and sent to IMR for inspection for visible parasites following the procedures laid down in Regulation (EC) No 2074/2005. Of these products, 101 were Atlantic cod (*Gadus morhua*), 59 were tusk (*Brosme brosme*), 59 were saithe (*Pollachius virens*), 30 were Greenland halibut (*Reinhardtius hippoglossoides*), 23 were ling (*Molva molva*), 10 were haddock (*Melanogrammus aeglefinus*) while 39 were whole non-eviscerated Atlantic mackerel (*Scomber scombrus*). The inspection procedure involved brief visual inspection of the skin and visceral cavity of each product under good down-light conditions in a wet lab that mimicked a fish processing line.

3 - Results

Of the 321 products examined, 108 (34 %) had visible parasites, of which 61 (19 % of the total) were considered as “obviously contaminated with parasites”. Products of tusk were the most problematic, followed by saithe, cod, ling and haddock products. No visible parasites were detected in Greenland halibut nor in the non-eviscerated Atlantic mackerel. The larvae of anisakid nematodes (mainly *Anisakis* sp., and less frequently *Phocanema* sp.), were the most common parasites found. These roundworms occurred either encapsulated in visceral tissue remains or were about to migrate into the fish muscle (Figure 1, 2, 3). Additionally, larvae (metacercariae) of the parasitic trematode *Cryptocotyle lingua** were occasionally observed as black spots on the fish skin and in the eyes of cod and haddock (Figure 4). In two saithe products, a non-zoonotic raphidascaridid nematode (*Hysterothylacium* sp.) and a cestode (possibly *Hepatoxylon* sp.) were found in some visceral tissue remains in the visceral cavity (see Table 1).

Table 1: Visible parasite findings in sampled fish products by species.

Fish species	N products sampled	N products with visible parasites (%)	N products considered obviously contaminated (%)	Parasite group and site of infection
Cod	101	34 (33.7%)	18 (17.8%)	*Anisakis* sp. and *Phocanema* sp. larvae in visceral remains and some about to enter the fillets; *Cryptocotyle lingua* in skin.
Tusk	59	44 (74.6%)	31 (52.5%)	*Anisakis* sp. larvae in visceral remains and some about to enter the fillets; *Phocanema* sp. larva in visceral remains.
Saithe	59	26 (44.1%)	11 (18.6%)	*Anisakis* sp. larvae in visceral remains and some about to enter the fillets; *Hysterothylacium* sp. adults (considered non-zoonotic) on skin (obviously originating from visceral cavity); Cestode (possibly *Hepatoxylon* sp.) in visceral remains.
Greenland halibut	30	0	0	
Ling	23	3 (13.0%)	1 (4.3%)	*Anisakis* sp. larvae in visceral remains and some about to enter the fillets.
Haddock	10	1 (10%)	0	*Cryptocotyle lingua* in skin.
Mackerel	39	0	0	
Total	321			

*Cryptocotyle lingua is a fish parasitic trematode (fluke). Its larval stage, known as metacercaria, commonly infects the skin of various fish species that more or less frequently enter the littoral zone where periwinkles occur abundantly (periwinkles act as 1st intermediate host of C. lingua, fish functions as 2nd intermediate host, while the parasite matures in fish-eating birds). In heavy infections, the metacercariae are readily visible as tiny black spots on the fish skin, a condition known as “black spot disease”. Additionally, metacercariae can occasionally be found subcutaneously in the fish flesh, thus potentially contaminating the distal parts of the fillets. EFSA has listed C. lingua as a zoonotic parasite (EFSA BIOHAZ Panel et al., 2024b).

Figure 1. Photographs of an eviscerated tusk (Brosme brosme) showing two clearly visible anisakid larvae penetrating the flesh: Phocanema sp. (reddish) and Anisakis sp. (yellowish).

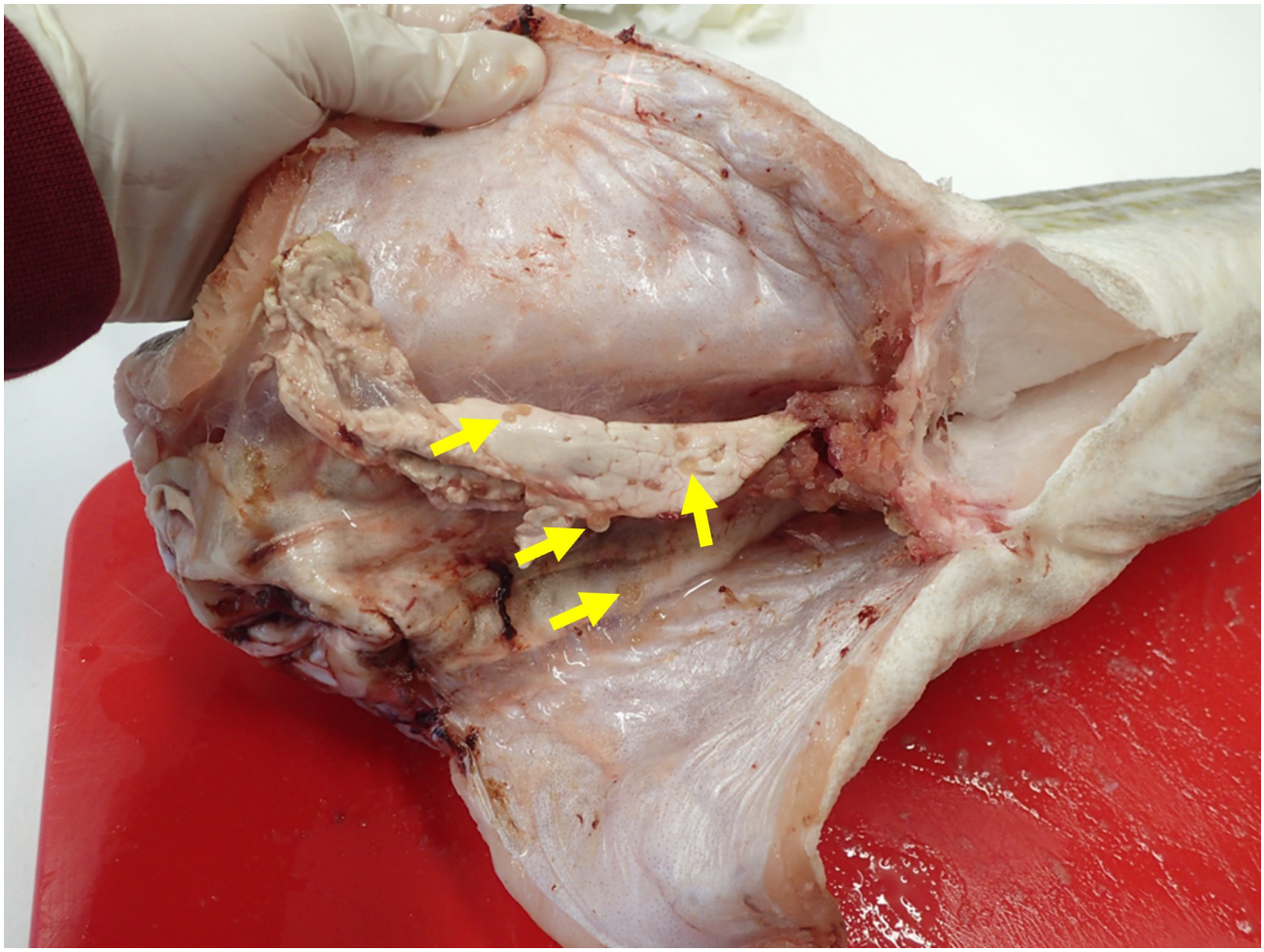

Figure 2. Photograph of an eviscerated Atlantic cod (Gadus morhua) showing several clearly visible Anisakis sp. larvae in liver remnants (yellow arrows).

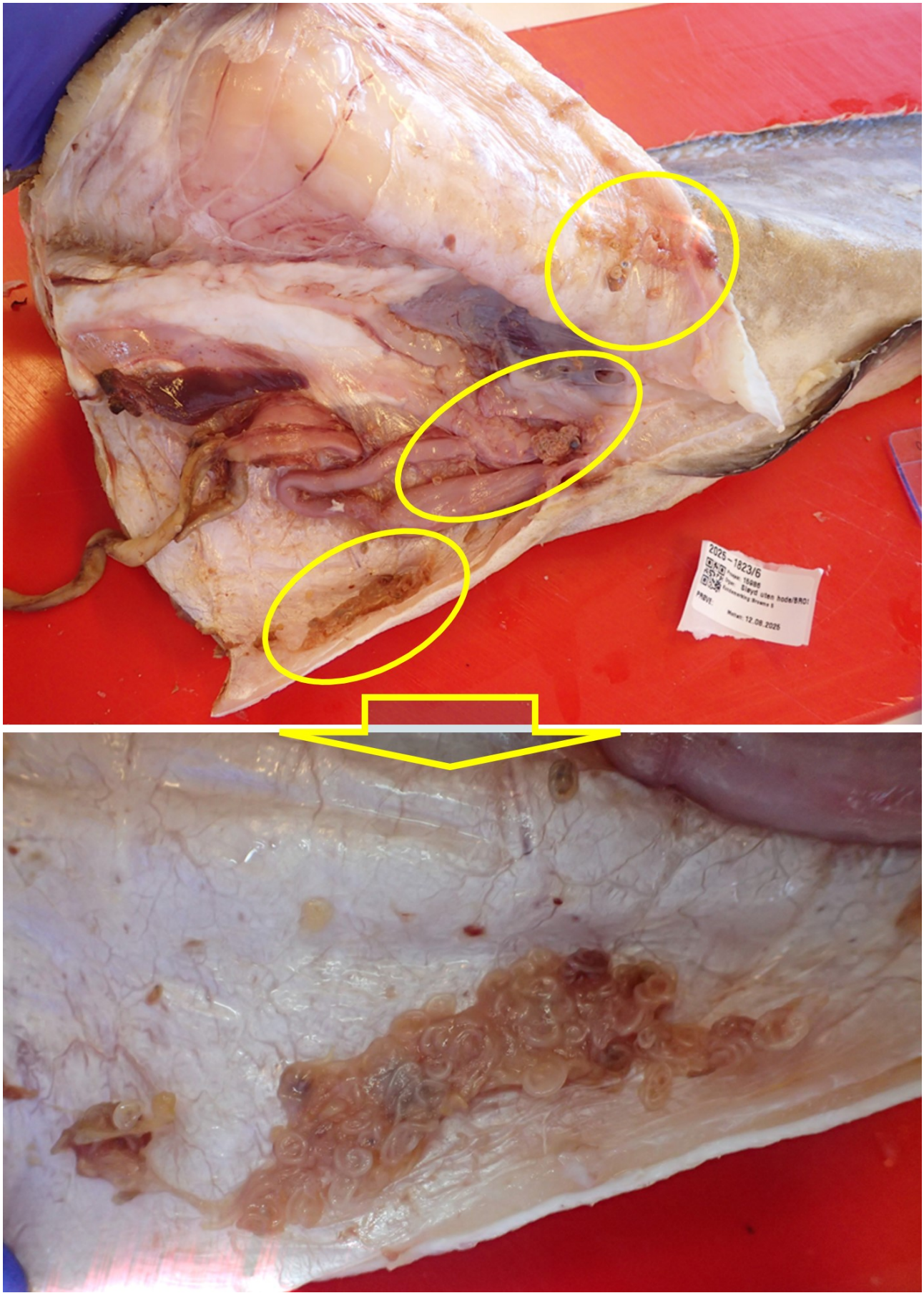

Figure 3. Photographs of an eviscerated tusk (Brosme brosme) showing numerous clearly visible Anisakis sp. larvae in viscera remnants.

Figure 4. Photograph of an Atlantic cod (Gadus morhua) product showing black spots on the skin caused by Cryptocotyle lingua.

4 - Conclusion

Approximately one third of examined fishery products contained visible parasites, and about one fifth (19%) were considered to be obviously contaminated. The main parasite groups identified were the zoonotic anisakid nematodes *Anisakis* sp. and *Phocanema* sp. in the visceral cavity and fillets, and the trematode *Cryptocotyle lingua* in the skin. Most anisakid larvae were encapsulated in visceral tissue remains or were in the process of penetrating into the muscle, particularly in tusk, cod and saithe. Most cases in which products were considered obviously contaminated with nematode or cestode parasites (Figures 2, 3), could have been prevented through improved cleaning and final control practices.

5 - References

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