

Case No: 2023-0356 Date of visit: 09/08/2023

Time spent on site: 4 Hours Main Inspector:

Site No: FS0804 Site Name: Kishorn B (North)
Business No: FB0125 Business Name: Scottish Sea Farms Ltd

Case Types: 1 DIA 2 REP 3 4 5 6

Water Temp (°C): 14.1 Thermometer No: Site FHI 045 completed N/A

Observations: Region: HI Water type: S CoGP MA: M-19

Dead/weak/abnormally behaving fish present? Y If yes, see additional information/clinical score sheet.
Clinical signs of disease observed? Y If yes, see additional information/clinical score sheet.
Gross pathology observed? Y If yes, see additional information/clinical score sheet.
Diagnostic samples taken? Y

UNI/REG only - if unable to carry out intended visit detail reason below: N/a

Additional Case Information:

In week 26 the site identified a large increase in numbers of micro jelly fish (Obelia) whilst conducting routine plankton checks which resulted in acute gill damage leading to an initial spike in mortality in week 26. The levels of mortality reduced in wk 27 following a reduction in plankton levels that week however mortality began to spike again in week 28 to present as a large population have developed very pale gills (anaemia from blood loss) following the initial insult which is causing on-going higher mortality. Plankton levels are currently low. The site are currently undergoing targeted harvests to reduce biomass.

Site inspected in a calm sea state, sun and little cloud cover which allowed for good visibility of the stock. From the physical inspection of the site, the visible population of SAL appeared lethargic and slow moving in all pens. Some weaker, moribund fish were observed resting against the net walls with strong operculum movement observed. Pens 2 and 5 appeared to be in the poorest condition in relation to fish health, 2 fish from each pen was removed for diagnostic sampling. One fish in cage 8 was observed hanging vertically which was also removed for sampling.

Only 6 pens remained stocked at Kishorn North, the site has been moved up in order of priority on the companies harvest plan and is now planned to fallow by the 18th August.

Site thermometer was used to record the water temperature as T309 was faulty.

Site is positive for AGD, last health check conducted in week 30.

Cleanerfish mortality : Week 31 - Week 28 : Wrasse : 2.33% 330 fish. Lumpfish Week 31 - 28 : 1.7% 619 fish.

Case No: **2023-0356** Site No: **FS0804**
 Date of Visit: **09/08/2023** Inspector(s): **[REDACTED]**

Registration/Authorisation Details

1. Business/site details summary checked by site representative? **Y**
 2. Changes made to details? **Y**

Site Details (include cleaner fish for all sections)

Total No facilities	10	Facilities stocked	6	No facilities inspected	10
Species	SAL	LUMP	WRS		
Age group	2022	2023	2023		
No Fish	199,932	27,800	12,000		
Mean Fish Wt	4.65kg	120g	150g		
Next Fallow Date (Site)	August 2023		Next Input Date (Site)	December 2023	
Recent (last 4 wks) disease problems?			Y	Any escapes (since last visit)?	N
If yes, detail:	CGD				

Movement Records

1. Movement records available for inspection? **Y**
 2. Date of last inspection: **17/07/2023**
 3. Are records complete and correctly entered? **Y**
 4. Are movement records available for dead fish and waste? **Y**
 5. Are records complete and correctly entered? **Y**
 6. Are health certificates for introductions (outwith GB) available? **Y**

Transport Records

1. Are any movements carried out by (or on behalf) of the business (not using a STB)? **[REDACTED]**
 If yes, is there a system in place for maintenance of transportation records? **[REDACTED]**

Mortality Records

1. Mortality records available for inspection? **Y**
 2. How are mortalities disposed of? **Other (detail)**
 If other detail: **Whole fish - Billy Bowie**
 3. Mortality records complete and correctly entered? **Y**
 4. Recent mortality (last 4 wks): **Wk 30 (25,883, 8.6%), Week 29 (27,463, 8%), Week 28 (10,101, 2.7%). See additional info for cleanerfish mortality.**
 5. Evidence of recent increased/atypical mortalities? **Y**
 If yes, facility nos/no mortality per facility/no stock per facility/reason:
Mortality is evenly spread across the site.
 6. Any other peaks in mortality during period checked? **N**
 If yes, detail:
 7. Have increased (unexplained) mortalities been reported to vet or FHI? **N/A**
 If yes, detail action:
 8. Have 'mortality events' been reported to FHI? If no, enter details on mortality events sheet. **Y**

Treatments and Medicines Records

1. Recent treatments (see comment)?	<input type="checkbox"/>	Y
If yes, detail: Benzocaine		
If other, detail: N/a		
2. Medicines records available for inspection?	<input type="checkbox"/>	Y
3. Are records complete and correctly entered?	<input type="checkbox"/>	Y
4. Are fish in a withdrawal period?	<input type="checkbox"/>	Y
5. If yes, what treatment(s)?	<input type="checkbox"/>	Benzocaine
If other, detail: N/a		
6. Are medicines stored appropriately?	<input type="checkbox"/>	Y

Biosecurity Records

1. Biosecurity records available for inspection?	<input type="checkbox"/>
2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?	<input type="checkbox"/>
3. Has the manner and period in which the APB will notify Scottish Ministers or veterinary professional of any <i>increased (unexplained)</i> mortality at the site been included?	<input type="checkbox"/>
4. Has the action that will be taken in the event that the presence or suspicion of the presence of a listed disease is detected been included and <i>how</i> and <i>when</i> that will be notified to Scottish Ministers?	<input type="checkbox"/>
5. Has the health status of aquaculture animals being stocked on the farm site been covered (equal or higher health status, certification if required)?	<input type="checkbox"/>
6. Have the husbandry and biosecurity measures implemented between each epidemiological unit to minimise transmission of disease been covered (movement of staff, visitors, equipment, live or dead fish etc.)?	<input type="checkbox"/>
7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?	<input type="checkbox"/>
8. Have the biosecurity procedures been adequately implemented on site?	<input type="checkbox"/>
If no, detail:	

Results of Surveillance

1. Has any animal health surveillance been carried out by, or on behalf of, the business?	<input type="checkbox"/>	Y
2. If yes, are results available for inspection?	<input type="checkbox"/>	Y
3. Any significant results?	<input type="checkbox"/>	Y
If yes, detail (if not detailed under recent disease problems).		

See additional info	
Records checked between:	17/07/23 - 09/08/2023

Case no: Site No: Date of visit/
 Sampling:

Priority samples: VI BA PA MG HI

Time sampling starts/ends: Inspector: VMD No.

Environmental conditions: 1 2 3 4 5

Summary samples HIST BA MG VI PA Total Samples

Add Fish/Pools - click

Pool/Fish No	F1	F2	F3	F4	F5							
Fish nos	1	2	3	4	5							
Pool Group												
Species	SAL	SAL	SAL	SAL	SAL							
Average weight	4.6kg	4.6kg	2.5kg	7kg	4.6kg							
Sex	N/A	N/A	N/A	N/A	N/A							
Water Type	SW	SW	SW	SW	SW							
Stock Details		Stofnfiskur	Stofnfiskur	Stofnfiskur	AquaGen	AquaGen						
	Stock Origin											
Facility No	5	5	8	2	2							

08/2023

Additional Sample Information:

5

Total Tests assigned

3

Case no: **2023-0356** Site No: **FS0804** Method of killing:

Date of visit: **09/08/2023** Inspector(s): Sheet Relevant: **Y**

S for strong presence: M for medium presence: W for weak presence

Fish Number		F1	F2	F3	F4	F5				
Time sampled after death (if > 45 minutes)					5	15				
External Signs										
Behaviour	Moribund	S	S	S	S	S				
	Lethargic	S	S	S	S	S				
	Hanging vertical					S				
	Spiralling									
	Flashing									
	Loss of equilibrium									
Body	Dark			W						
	Distended abdomen									
	Anorexic			M						
	Scale Oedema									
Opercula	Shortened				W	W				
	Flared									
Haemorrhaging	Throat									
	Ventrum				W					
	Base of fins									
	Elsewhere									
Eyes	Exophthalmic									
	Enophthalmic (sunken)									
	Cataract									
	Haemorrhagic									
Gills	Pale	M	S	M	W	W				
	Zoned									
	Necrotic									
Lesions	Flank									
	Elsewhere									
Vent	Inflamed									
	Trailing faeces									
Lice Load	Estimate numbers	12	17	9	19	21				
Internal Signs										
Ascites	Clear	W	W		W					
	Bloody	M	M		W					
Oedema	In tissues									
Heart	Pale/anaemic									
	Granulomas									
	Deformed									
Liver	Petechial haem				S					
	Gross haem									
	Tissue breakdown									
	Enlarged									
	Colour number(s)	3	3	3	6	5				
	Granulomas									
	Lesions									
Pyloric caeca	Petechial haem									
	Tubules mauve									
	Lack of fat									
Spleen	Enlarged				S					
	Granulomas									
Gut	No food present	S	S	M	W	W				
	Yellow pseudo-faeces									
	External haem									
	Internal haem				S					
Body wall	Haemorrhaging									
Swim bladder	Haemorrhaging									
	Fluid filled									
Kidney	Swollen									
	Grey									
	Granular									
	Liquefied									
General	Parasites present									
	Anaemia									

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	Fluid filled												
Kidney	Swollen												
	Grey												
	Granular												
General	Liquefied												
	Parasites present												
	Anaemia												

Additional comments:

Site No: FS0804
Case No: 2023-0356
Nature of non-compliance:
Action taken (FHI):
Non-compliance relevant to (delete): VirologyMolGen/Bacteriology/Histology/Parasitology



Case No:	2023-0356	Date of visit:	09/08/2023
Site No:	FS0804	Inspector:	

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2 nd Insp
AGDQ	5/5	16/08/2023		16/08/2023				
PNST	5/5	16/08/2023		16/08/2023				
IHNP	0/5	16/08/2023		16/08/2023				
IPNM	0/5	16/08/2023		16/08/2023				
ISAG	0/5	16/08/2023		16/08/2023				
PMVP	2/5	16/08/2023		16/08/2023				
SPVP	4/5	16/08/2023		16/08/2023				
SALP	0/5	16/08/2023		16/08/2023				
VHSP	0/5	16/08/2023		16/08/2023				
Vibrio species (culture) - VSPE	5/5	30/08/2023		30/03/2023				
Amoebic gill disease (histology) - AMGD	1/5	30/08/2023		30/03/2023				
Complex gill issues (histology) - CGDH	4/5	30/08/2023		30/03/2023				
Epitheliocystis - EPIT	1/5	30/08/2023		30/03/2023				
Gill pathology - GPAT	4/5	30/08/2023		30/03/2023				
Heart pathology - HPAT	5/5	30/08/2023		30/03/2023				
Liver pathology - LPAT	5/5	30/08/2023		30/03/2023				
Cardiomyopathy syndrome (histology) - CMPS	1/5	30/08/2023		30/03/2023				
Spleen pathology - SPAT	2/4	30/08/2023		30/03/2023				
Postmortem changes - PMCH	3/5	30/08/2023		30/03/2023				
*emailed								

Report Summary			
Case Type	Date	Insp	2 nd Insp
DIA	22/09/2023		



FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS No	FB0125	DATE OF VISIT	09/08/2023
SITE No	FS0804	SITE NAME	Kishorn B (North)
CASE No	20230356	INSPECTOR	[REDACTED]

Section 1: Summary

The above site was inspected following reports of increased mortality by the farm operator. During the physical inspection of the site, five fish were removed for diagnostic sampling.

Histopathological examination revealed features consistent with mild, multifocal, hyperplastic bronchitis, amoebic gill disease confirmed by qPCR. The presence of some epitheliocystis. Hepatocellular necrosis and necrotising splenitis was also observed. Mild myocarditis observed could be associated with the presence of piscine myocarditis virus (PMCV) confirmed by qPCR.

Vibrio sp. was identified on plates taken from kidney material of F4 and F5 and from plates taken from gill material of all 5 fish. A second *Vibrio* sp. was identified on plates taken from kidney material of F4 and F5. The level and purity of growth observed would not suggest these bacteria would be implicated in morbidity.

Five fish tested positive for *Neoparamoeba perurans* and *Paranucleospora theridion* by qPCR, four fish tested positive for salmon gill poxvirus (SGPV) and two fish tested positive for PMCV.

Please contact myself or the duty inspector should you require any further information, have any queries regarding this report or if any problems develop.

Section 2: Case Detail

Observations

The site was inspected following reports of prolonged increased mortality by the farm operator. At the time of visit the site was stocked with 199,932 Atlantic salmon at an average weight of 4.65kg.

A large increase in numbers of micro jelly fish (*Obelia* sp.) were identified during routine site plankton trawls in week 26 and again in week 28, over time the stock on site developed anaemia from blood loss as a result of these bloom events. At the time of inspection plankton levels had dropped back within a normal range, however mortality was still ongoing.

From the physical inspection of the site, the visible population of Atlantic salmon appeared lethargic and slow moving in all pens. Some weaker, moribund fish were observed resting against the net walls with strong operculum movement observed. Fish in pens 2 and 5 appeared to be in the poorest condition in relation to fish health, two fish from each pen were removed for diagnostic sampling. One fish in cage 8 was observed hanging vertically which was also removed for sampling.

All fish sampled presented lethargic and moribund prior to removal for sampling. Externally all five fish had between 10 – 20 lice present of all stages. F4 and F5 had shortened opercula and F4 also presented anorexic and was dark to the body. The gills of all five fish were very pale.

Internally, F1, F2 and F3 had clear and bloody asities present within the body cavity. F4 had an enlarged spleen, and some petechial haemorrhaging was observed on the liver. No food was present in the gut of all five fish sampled.

Samples

Samples were collected from five fish according to the table below:

Fish number	Facility number	Species	Stage	Origin
F1	5	Atlantic salmon	2022	Stofnfiskur
F2	5	Atlantic salmon	2022	Stofnfiskur
F3	8	Atlantic salmon	2022	Stofnfiskur
F4	2	Atlantic salmon	2022	AquaGen
F5	2	Atlantic salmon	2022	AquaGen

Results

Bacteriology: Kidney and gill material from F1 – F5 was inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated:

- *Vibrio* spp.: F4 and F5 (Kidney), F1 – F5 (Gill).

The level and purity of this isolate would not suggest that it would be implicated as a primary cause of morbidity.

Virology: Tissue samples were tested for segments of nucleic acid indicative of the presence of the pathogens specified below using real-time PCR (qPCR).

Salmon gill poxvirus

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	21.45	29.29	29.39	29.46	POSITIVE
F2	21.30	34.17	35.34	35.04	POSITIVE
F3	21.22	31.98	32.07	31.93	POSITIVE
F4	-	-	-	-	Negative
F5	21.37	27.01	27.01	27.03	POSITIVE

Piscine myocarditis virus (PMCV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	-	-	-	-	Negative
F2	-	-	-	-	Negative
F3	-	-	-	-	Negative
F4	17.46	20.71	20.72	20.96	POSITIVE
F5	16.87	24.61	24.74	24.76	POSITIVE

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious salmon anaemia virus (ISAV), viral haemorrhagic septicemia virus (VHSV), Infectious pancreatic necrosis virus (IPNV) and Salmonid alphavirus (SAV).

Parasitology: Tissue samples were tested for segments of nucleic acid indicative of the presence of the parasites specified below using real-time PCR (qPCR).

Neoparamoeba perurans (AGD)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	21.45	30.77	30.67	30.76	POSITIVE
F2	21.30	28.80	28.79	28.83	POSITIVE
F3	21.22	28.45	28.55	28.54	POSITIVE
F4	21.72	32.62	32.35	31.90	POSITIVE
F5	21.37	31.00	30.97	30.90	POSITIVE

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	20.05	32.86	32.95	33.12	POSITIVE
F2	20.13	35.55	35.57	35.57	POSITIVE
F3	19.90	31.52	31.86	31.84	POSITIVE
F4	20.05	33.30	33.80	33.61	POSITIVE
F5	19.53	32.28	32.29	32.88	POSITIVE

Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from F1 – F5. The tissue samples were fixed in 10% neutral buffered formalin.

Histopathological examination revealed the following:

Gill: Lamellar hyperplastic branchitis, mild to moderate, multifocal (F2-F4), lamellar vascular disturbances (F2-F4). Presence of few amoeboid cells resembling *Neoparamoeba perurans* observed in F3 and few basophilic epithelial inclusions (likely epitheliocystis) F1. Some aneurysmal dilation/telangiectasia and free blood among gill filaments (F2). F5 reading hindered by sampling artefacts.

Skin & Muscle: Within normal range.

Heart: Mild, multifocal, myocarditis (F4). Some thrombi nests in ventricular chamber (F3). Minor pericarditis (F1, F2, F5). F3 no atrium in section.

Gut and pyloric caeca: Some cell sloughing potentially associated with post-mortem artefact observed in F1, F4, F5. F5 almost no pyloric caeca present.

Pancreas: Within the normal range.

Liver: Hepatocellular necrosis, mild, multifocal to coalescence F3, F5, cuffing (F1, F4), hepatocellular vacuolation (macrovesicles), mild, diffuse (F1, F2, F4).

Kidney: Slight increase of melanomacrophages (F3), presence of hyaline droplets on the epithelium of few renal tubules (F4). Foci of interstitial cell (haemopoietic) reduction (F5).

Spleen: Necrotising splenitis, multifocal, mild to moderate (F2 & F5) and slightly congested (F5). F1: Spleen not present.

Signed:



Fish Health Inspector

Date: 22/09/2023

The Fish Health Inspectorate Service Charter detailing standards of service is available on the Scottish Government website at [Fish Health Inspectorate Service Charter - gov.scot \(www.gov.scot\)](https://www.gov.scot/Topics/marine/science/fishhealth)

F1







F2







F3



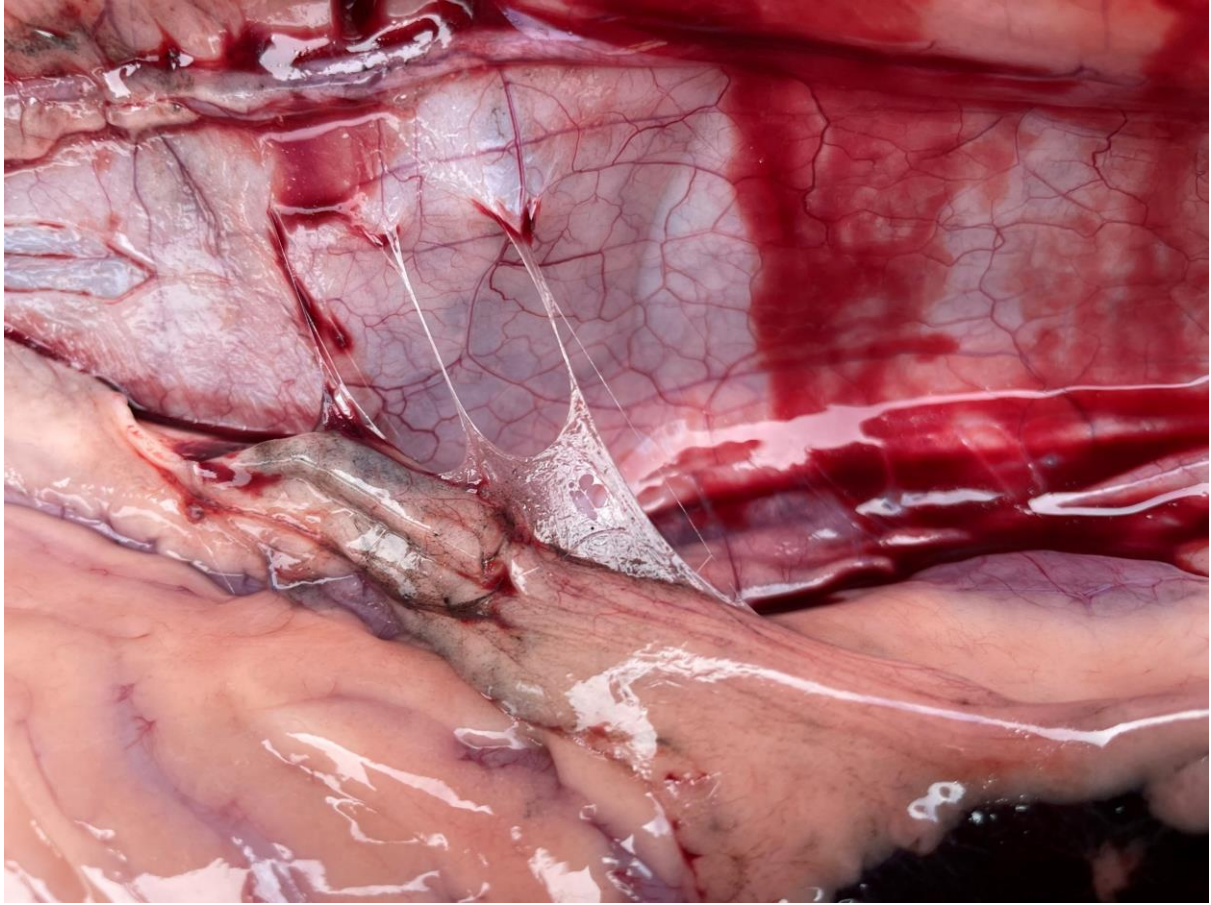


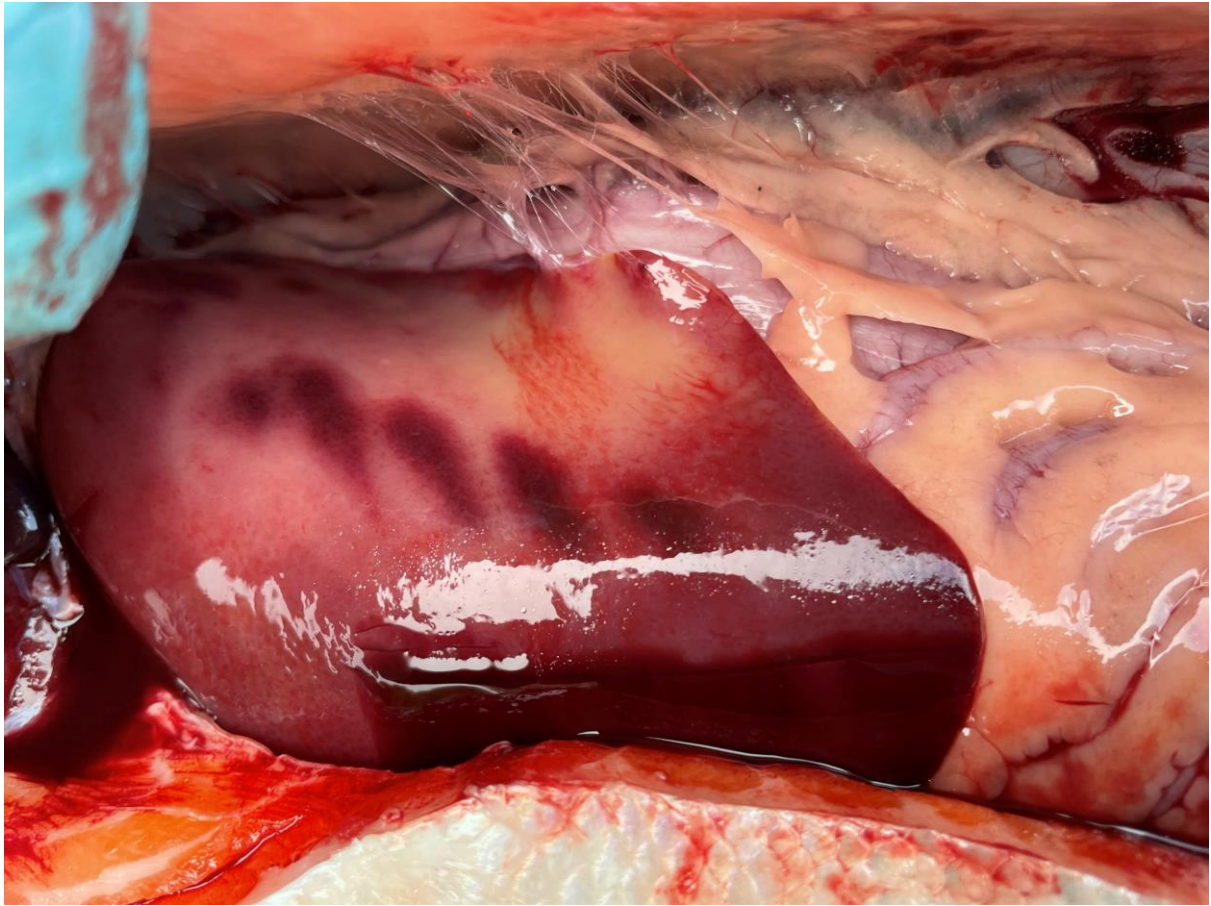


F4









F5





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