Case No: 2022-0229 Date of visit: 27/07/2022

Time spent on site: 7.5h Main Inspector: [redacted]

Site No: FS1277 Site Name: Reibinish
Business No: FB0169 Business Name: The Scottish Salmon Company

Case Types: 1 DIA 2 3 4 5 6

Water Temp (°C): 12.6 Thermometer No: T310 FHI 045 completed N/A

Observations: Region: WI Water type: S CoGP MA: W-8

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:

Additional Case Information:

Site inspection and paper work conducted by [redacted], supervised by [redacted].
F1 sampled by [redacted], F2 - F4 sampled by [redacted] and supervised by [redacted].
The site was visited in response to prolonged elevated mortality caused by an early spring plankton bloom causing gill irritation and anaemia. Visibility was good on the date of inspection, with fish feeding deep. A number of lethargic fish were observed across the entire pen group. Pens 2, 8 and 16 displayed the highest number of visibly lethargic and moribund fish, fish from these pens were selected for diagnostic sampling.

The site experienced mass mortality due to input failure at the beginning of the cycle with their KLM stock upon first input, the site lost 4 cages totalling >200,000 fish. Input mortality of KLM stock attributed to Tenacibaculum and a poor feeding response. Following the input failure of the KLM stock, the site restocked with 550,000 fish from Loch Lochy in early August 2021. This stock is currently still held onsite although mortality for the cycle has been in excess of 60%, most of this mortality attributed to gill health issues suffered from an early spring plankton bloom. The site has conducted 6 slice treatments this cycle with a withdrawal of 500 degree days. Last slice treatment dated 22/06/2022, with all pens being treated over a 7 day period. Daily plankton trawls are conducted onsite, nothing significant has been dected this cycle but it is thought that a plankton bloom occurred and passed through the site in late April 2022 during the night. Around this time high levels of plankton were identified at Scotasay (nearby site within 4 miles).

Mortalities are removed onsite using a mort uplift system and the waste is taken by white shore cockels for landfill. The site employed the Backiness for mort removal between 28th June - 16th July 2022, waste was ensiled on the boat.

Shorebase moved to Scalpay.

Case No: 2022-0229 Site No: FS1277

Date of Visit: 27/07/2022 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		16	Facilities stocked		12	No facilities inspected		12
Species	SAL	LUM						
Age group	2021 Q3	2021						
No Fish	229,836	26,612						
Mean Fish Wt	4.6kg	180g						
Next Fallow Date (Site)		09/2022		Next Input Date (Site)		Spring 2023		
Recent (last 4 wks) disease problems?			Y	Any escapes (since last visit)?				N

If yes, detail: Fish don't appear to have recovered from suspected plankton bloom early in cycle. Ongoing Gill challenges.

Movement Records

1. Movement records available for inspection?	Y
2. Date of last inspection:	16/02/2022
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?	N/A

Transport Records

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

Mortality Records

1. Mortality records available for inspection?	Y
2. How are mortalities disposed of?	Other (detail)
If other detail:	White shore cockles
3. Mortality records complete and correctly entered?	Y
4. Recent mortality (last 4 wks):	SAL: Week 29 (6,096 2.57%), Week 28 (11,571 4.65%), Week 27 (18,329 6.86%), Week 26 (21,114, 7.33%) LUM: Week 29 (175, 0.65%) Week 28 (237, 0.88%), Week 27 (79, 0.29%), Week 26 (291, 1.06%)
5. Evidence of recent increased/atypical mortalities?	Y

If yes, facility nos/no mortality per facility/no stock per facility/reason:

A wide range in mortality seen over dates checked. Divers occasionally employed to assist with mort removal, on dates where mortality has spiked. Mortality has been constantly high across the site for the past 12 weeks. Mortally beginning to show signs of slowing down.

6. Any other peaks in mortality during period checked?	Y
If yes, detail:	Mortality has exceeded the reporting threshold weekly from 15/05/2022 - 07/08/2022. Peaks in mortality for the weeks beginning 04/07/2022 (7.33%) and 11/07/2022 (6.86%).
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)?	Y
If yes, detail:	T.M.S.
If other, detail:	Slice
2. Medicines records available for inspection?	Y
3. Are records complete and correctly entered?	Y
4. Are fish in a withdrawal period?	Y
5. If yes, what treatment(s)?	Slice
If other, detail:	
6. Are medicines stored appropriately?	Y

Biosecurity Records

1. Biosecurity records available for inspection?	
2. Has the manner and frequency of mortality removal, recording and safe disposal been considered?	
3. Has the manner and period in which the APB will notify Scottish Ministers or veterinary professional of any *increased* (*unexplained)* mortality at the site been included?	
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 *how* and *when* that will be notified to Scottish Ministers?	
5. Has the health status of aquaculture animals being stocked on the farm site been covered (equal or higher health status, certification if required)?	
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.)?	
7. Is documentation available regarding the measures in place to maintain the physical containment of aquaculture animals held on site?	
8. Have the biosecurity procedures been adequately implemented on site?	
If no, detail:	

Results of Surveillance

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

PatoGen report 15/7/22: Gill PCR samples 1/12 AGD; Branchiomonas, Paranucleospora & Poxvirus 3/3. PatoGen report 19/7/22: Furunculosis 2/2, PRV 2/2, PMCV 1/2, T. maritimum 2/2.

Records checked between: 16/02/2022 - 27/07/2022

Case no:	2022-0229	Site No:	FS1277	Date of visit/ Sampling:	27/07/2022	27/(						
Priority samples:	VI		BA		PA		MG		HI			
Time sampling starts/ends:	15:00:00	16:45:00	Inspector:		VMD No.	0						
Environmental conditions:	1	Dry	2	Sunny	3	Cloudy	4		5			
Summary samples	HIST	Y	BA	Y	MG	Y	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												
Stock Details	Species	SAL	SAL	SAL	SAL	SAL							
	Average weight	2kg	4kg	2.5kg	3kg	4kg							
	Sex	N/A	N/A	N/A	N/A	N/A							
	Water Type	SW	SW	SW	SW	SW							
	Stock Origin	Loch Lochy	Loch Lochy	Loch Lochy	Loch Lochy	Loch Lochy							
	Facility No	2	8	2	16	16							

07/2022 Additional Sample Information:

F1 sampled by [redacted], F2 - F4 sampled by [redacted].

5 Total Tests assigned 5

Case no: 2022-0229 Site No: FS1277 Method of killing: Percussive

Date of visit: 27/07/2022 Inspector(s): [redacted] 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)			60min		90min	100min					
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				W					
	Distended abdomen										
	Anorexic	M		W							
	Scale Oedema										
Opercula	Shortened				W						
	Flared										
Haemorrhaging	Throat										
	Ventrum										
	Base of fins										
	Elsewhere										
Eyes	Exophthalmic										
	Enophthalmic (sunken)					M					
	Cataract										
	Haemorrhagic										
Gills	Pale	M	S	M	M	M					
	Zoned	M	M	M	M	M					
	Necrotic										
Lesions	Flank				M						
	Elsewhere										
Vent	Inflamed										
	Trailing faeces										
Lice Load	Estimate numbers	25	15	50	30	30					
Internal Signs											
Ascites	Clear										
	Bloody	S	W	S		M					
Oedema	In tissues										
Heart	Pale/anaemic										
	Granulomas										
	Deformed			M							
Liver	Petechial haem	M		S		W					
	Gross haem										
	Tissue breakdown										
	Enlarged	W									
	Colour number(s)	6	4	7	3	7					
	Granulomas										
	Lesions										
Pyloric caeca	Petechial haem		W								
	Tubules mauve										
	Lack of fat										
Spleen	Enlarged					S					
	Granulomas					W					
Gut	No food present			M		M					
	Yellow pseudo-faeces	S			S						
	External haem										
	Internal haem										
Body wall	Haemorrhaging					S					
Swim bladder	Haemorrhaging	W	S								
	Fluid filled										
Kidney	Swollen										
	Grey										
	Granular										
	Liquefied										
General	Parasites present	W									
	Anaemia										

Case no: 2022-0229

Date of visit: 27/07/2022

S for strong presence: **M** for medium presence: **W** for w

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

Additional comments:

F4 hanging vertically in the water and gasping

F1 substantial damage to the jaw (lower jaw looked like it was sliced in half, upper jaw partially missing); sampled something from the body cavity for parasitology unsure if this was a parasite.

F3 substantial damage to both eyes. Some damage to the snout. Damage to the operculum thought to be lice damage.

Site No: FS1277

Case No: 2022-0229

Nature of non-compliance:

Action taken (FHI):

Non-compliance relevant to (delete): VirologyMolGen/Bacteriology/Histology/Parasitology

Case No: 2022-0229 Date of visit: 27/07/2022

Site No: FS1277 Inspector:

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2nd Insp
MG-IHN	0/5	05/08/2022		11/08/2022		25/05/2022		
MG-VHS	0/5	05/08/2022		12/08/2022		25/05/2022		
MG-IPN	5/5	05/08/2022		13/08/2022		25/05/2022		
MG-PMCV	1/5	05/08/2022		14/08/2022		25/05/2022		
MG-SAV	0/5	05/08/2022		15/08/2022		25/05/2022		
MG-ISA	0/5	05/08/2022		16/08/2022		25/05/2022		
MG-SAL POX	4/5	05/08/2022		17/08/2022		25/05/2022		
MG- Para	5/5	05/08/2022		18/08/2022		25/05/2022		
MG-AGD	1/5	05/08/2022		19/08/2022		25/05/2022		
PMCH	3/5	12/08/2022		12/08/2022		25/05/2022		
AERH	1/5	12/08/2022		12/08/2022		25/05/2022		
KPAT	2/5	12/08/2022		12/08/2022		25/05/2022		
HPAT	2/5	12/08/2022		12/08/2022		25/05/2022		
VSPE	3/5	19/08/2022				26/05/2022		
VSPE	2/5	19/08/2022				27/05/2022		
ASAL	1/5	19/08/2022				28/05/2022		

Report Summary			
Case Type	Date	Insp	2nd Insp
DIA	25/08/2022		

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	FB0169	**DATE OF VISIT**	27/07/2022
SITE NO	FS1277	**SITE NAME**	Reibinish
CASE NO	20220229	**INSPECTOR**	[redacted]

Section 1: Summary

The site was inspected due to sustained mortality reports above the reporting criteria attributed to gill issues. Five fish were selected for diagnostic sampling.

Histopathological examination revealed features consistent with *Aeromonas salmonicida*, the causative agent of furunculosis, in F2. Although F1 tested positive for piscine myocarditis virus (PMCV) by qPCR, the heart only displayed a minimal focal lesion that is likely related to this virus. Features of autolysis were observed and may have hindered the reading.

Aeromonas salmonicida was identified on plates taken from kidney and gill material of F2. Two *Vibrio* spp. were also identified. *Aeromonas salmonicida* is a primary fish pathogen and poses a significant risk to fish health. *Vibrio* sp. is more commonly a secondary pathogen. The level and purity of growth would not suggest that any one of these bacteria should be implicated as the primary cause of morbidity in this case.

Samples also tested positive for gill related pathogens: *Paranucleospora theridion* (5/5), salmon gill poxvirus (SGPV) (4/5) and *Neoparamoeba perurans* (AGD) (1/5). Samples tested positive for Infectious pancreatic necrosis virus (IPNV) (5/5) and Piscine myocarditis virus (PMCV) (1/5).

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 due to sustained mortality reports above the reporting criteria attributed to gill issues. At the time of the visit the site was stocked with 2021 Q3 stock at an average weight of 4.6kg. Lethargic and moribund fish were observed in the majority of pens on site. Five fish were selected for diagnostic sampling.

All five fish sampled displayed moribund and lethargic behaviour prior to removal from the pens, with F4 also hanging in the water vertically and gasping at the surface. Externally, F1 & F5 showed a darker body colour and F1 & F3 appeared anorexic to varying degrees. F4 has a shortened operculum, while F5 had enophthalmic eyes. The gills were pale and zoned on all five fish. F4 has a lesion on the flank and all fish had a noticeable presence of lice between 15-30 per fish all stages.

Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science

Internally, bloody ascites was evident in F1-F3 and F5. The heart appeared deformed in F3. Petechial haemorrhaging was evident in F1, F3 and F5, with the liver also being enlarged in F1. F2 had some petechial haemorrhaging on the pyloric caeca. F5 had an enlarged spleen, which also appeared granulomas. No food was present in the gut of F3 and F5, while F1 and F4 has yellow pseudo faeces present. F1 and F2 showed haemorrhaging on the swim bladder, while F5 showed haemorrhaging on the body wall.

Samples

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

Fish number	Facility number	Species	Stage	Origin
F1, F3	2	Atlantic salmon	2021, Q3; 2-2.5kg	Loch Lochy
F2	8	Atlantic salmon	2021, Q3; 4kg	Loch Lochy
F4-F5	16	Atlantic salmon	2021, Q3;3-4kg	Loch Lochy

Results

Bacteriology: Kidney and gill material from F1 – F5, as well as lesion material from F4, was inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated:

- *Aeromonas salmonicida*: F2 (Kidney & Gill)
- *Vibrio* sp.: F3, F4, F5 (Kidney); F4 (Lesion)
- *Vibrio* sp.: F3 (Kidney); F4 (Lesion)

Aeromonas salmonicida is a primary fish pathogen and poses a significant risk to fish health. *Vibrio* sp. is more commonly a secondary pathogen. The level and purity of growth would not suggest that any one of these bacteria should be implicated as the primary cause of morbidity in this case.

From the antimicrobial sensitivity tests conducted for *Aeromonas salmonicida*, we have evidence which may indicate resistance to amoxycillin. We do not have evidence of resistance to oxytetracycline, sulphamethoxazole/trimethoprim or florfenicol.

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

Infectious pancreatic necrosis virus (IPNV)

Fish Number	**Endogenous control Cp value**	**Cp Values**			**Reported Result (PCR)**
F1	16.79	28.93	28.85	28.91	**POSITIVE**
F2	16.98	36.38	35.25	35.4	**POSITIVE**
F3	18.14	33.56	34.03	33.86	**POSITIVE**
F4	18.06	34.48	34.37	34.82	**POSITIVE**
F5	17.46	34.56	34.33	34.45	**POSITIVE**

Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science

Piscine myocarditis virus (PMCV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	17.07	22.5	22.14	22.46	**POSITIVE**
F2	-	-	-	-	Negative
F3	-	-	-	-	Negative
F4	-	-	-	-	Negative
F5	-	-	-	-	Negative

Salmon gill poxvirus (SGPV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	18.94	34.08	34.9	34.23	**POSITIVE**
F2	19.29	37.47	35.47	36.07	**POSITIVE**
F3	-	-	-	-	Negative
F4	19.28	28.96	29.12	28.96	**POSITIVE**
F5	18.99	32.5	32.61	32.37	**POSITIVE**

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

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	-	-	-	-	Negative
F2	-	-	-	-	Negative
F3	-	-	-	-	Negative
F4	19.28	33.23	33.55	34.27	**POSITIVE**
F5	-	-	-	-	Negative

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	18.94	31.14	31.24	30.85	**POSITIVE**
F2	19.29	32.93	33.92	32.72	**POSITIVE**
F3	18.72	34.42	35.14	34.64	**POSITIVE**
F4	19.28	31.37	31.05	29.97	**POSITIVE**
F5	18.99	28.41	28.32	28.24	**POSITIVE**

A sample from the body cavity of an Atlantic salmon was received in ethanol. It had been observed attached from the distal edge of the liver to the pyloric caeca.

Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science

On inspection, the sample was filamentous, terminating in some fatty tissue and displayed no morphology consistent with a parasite. There was evidence of melanisation which was also observed on the lining of the body cavity from sampling pictures. Due to this, the sample is likely a fibrinous exudate as result of an inflammatory reaction in the fish.

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 by light microscopy revealed the following:

Gill: Few sparse lamellae with epithelial thickness (F1-F5). One basophilic epithelial inclusion (likely epitheliocystis) observed in F1. Some multifocal hyperplasia. Several aneurysmal dilation/telangiectasia (F1-F5). F3 displayed congested lamellae potentially associated with euthanasia method. F2, F4 & F5, autolysis artefacts hindered the reading.

Skin & Muscle: Partial absence of epidermal layer, dermal oedema, sparse leucocyte infiltration and mixed Gram-negative bacteria (F4).

Heart: F2 several dense aggregates of varied size of rod-shaped Gram-negative bacteria, one area of fibre necrosis at the vicinity of the bacterial aggregates. F1 displayed one minimal area with sub-endocardial infiltration in both heart chambers. Mild pericarditis (F1, F4). Inflammatory cell infiltrate (mainly neutrophil granulocytes) observed in several areas of the trabecular spongy layer and within the vessels observed in F4. F3 no atrium chamber present in section.

Gut and pyloric caeca: Marked cellular sloughing potentially associated with autolysis artefacts (F3-F4). Some fibrous adhesions (likely associated with vaccine administration) (F1).

Pancreas: Within the normal range. F4 autolysis artefacts hindered the reading.

Liver: Minimal cuffing (F1). Several aggregates of rod-shaped Gram-negative bacteria. Small foci of cellular necrosis at the vicinity of the bacterial aggregates. Circulating leucocytes observed in the vessels (F2). F5, capsulitis, inflammatory cell infiltrate, multifocal, mild and some sinusoidal congestion. F4 autolysis artefacts hindered the reading.

Kidney: Foci of cellular necrosis and aggregates of rod-shaped Gram-negative bacteria associated (F2). Some cuffing and small foci of cellular necrosis observed in F1. F4 autolysis artefacts hindered the reading.

Spleen: Cuffing (F1), cellular necrosis and marked presence of dense aggregates of rod-shaped Gram-negative bacteria (F2).

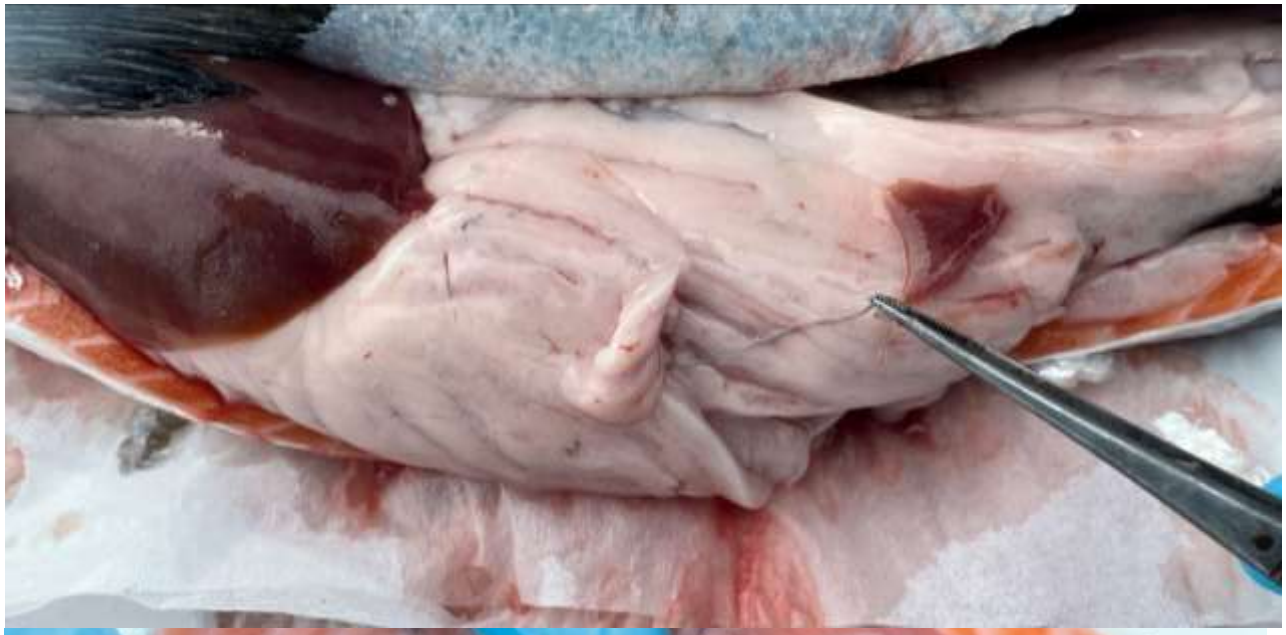
Signed: [redacted] Date: 25/08/2022

Fish Health Inspector

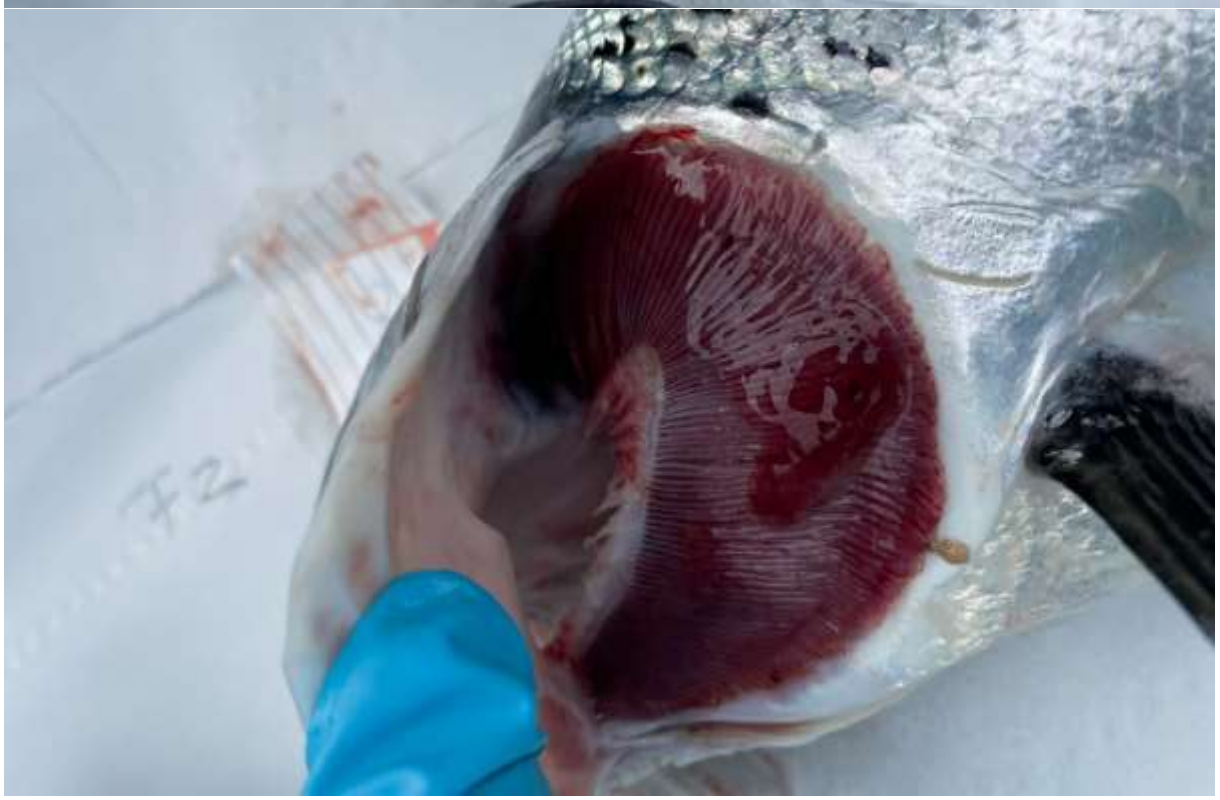
The Fish Health Inspectorate Service Charter detailing standards of service is available on the Marine Scotland website at https://www.gov.scot/publications/fish-health-inspectorate-service-charter/

Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
Tel – 0131 244 3498 Fax – 0131 244 0944 Email – ms.fishhealth@gov.scot
Website - www.gov.scot/Topics/marine/science

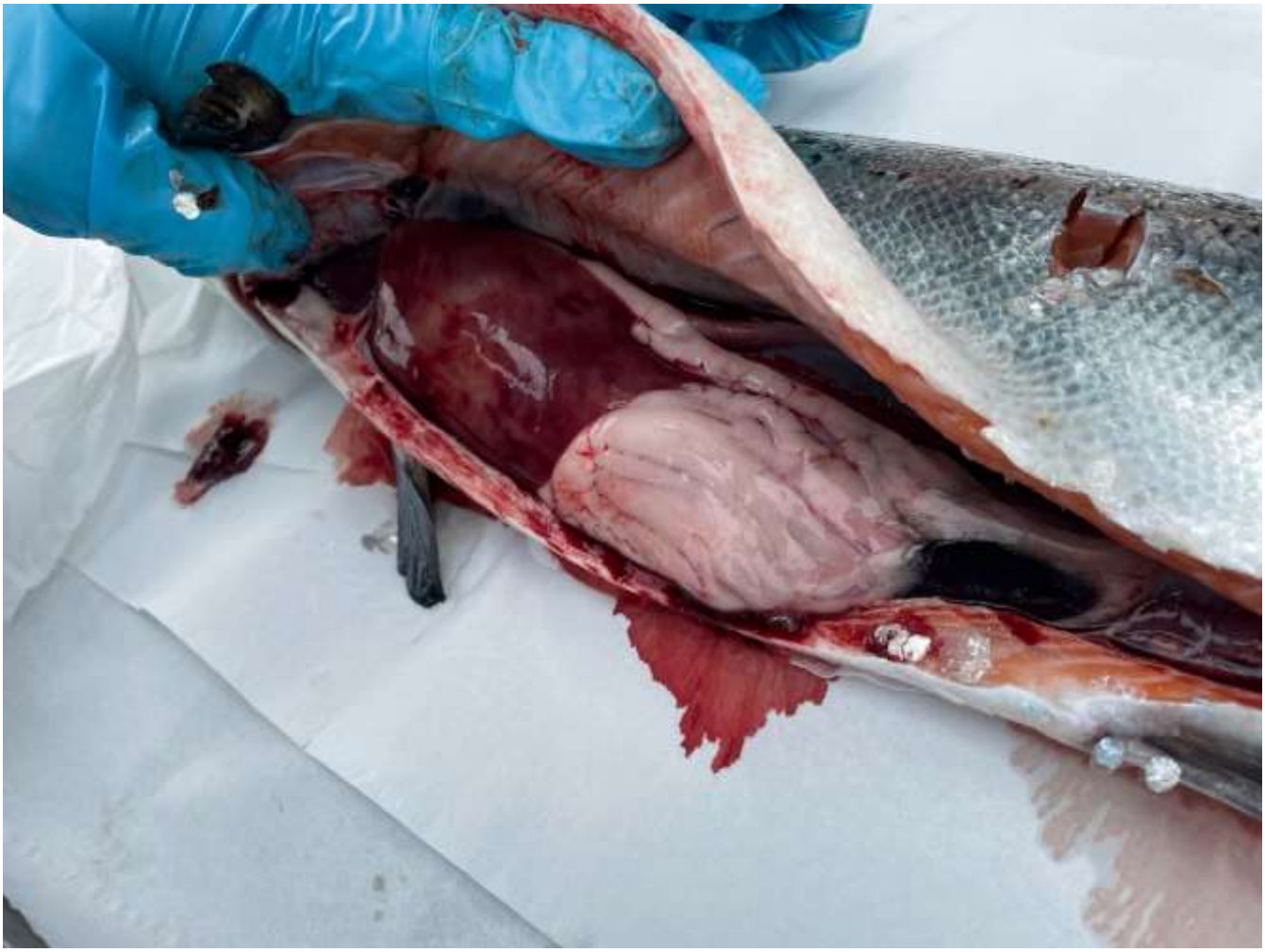
2022-0229 (FS1277 Reibinish)
F1



F2



F3



F4

F5