Case No:	2024-0281	Date of visit:	25/07/2024
Time spent on site:	4 Hours	Main Inspector:	[redacted]
Site No:	FS0646	Site Name:	Soay
Business No:	FB0119	Business Name:	Mowi Scotland Ltd

Case Types: 1 DIA 2 REP 3 4 5 6

Water Temp (°C): 14.4 Thermometer No: T309 FHI 045 completed N/A

Observations: Region: WI Water type: S CoGP MA: W-7

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 inspected in overcast conditions and a calm sea state, visibility of the stocks was good. The site was inspected following reports of prolonged increased mortality. The site was previously inspected on 26/03/2024 and diagnostic samples were taken, case 2024-0096.

Upon inspection of the stocks, fish were observed to be residing quite deep within the pens. The majority of the population were observed shoaling well. A small population of fish in each pen were slightly lethargic. 2 moribunds, with one fish displaying abnormal swimming behaviour was removed from pen 7 for diagnostic sampling. 3 further moribunds were observed in pens 3 and 14 and were removed for sampling.

Salmon mortalities at Soay have been persistently elevated throughout the duration of 2024. For May June and July mortality has regularly been above 1% weekly. Since the date of last inspection, mortality peaked at 4.74% w/b03/06/24 and 3.58% wb 24/06/2024. In these weeks mortality was mainly attributed to treatment losses (post thermolicer treatment), Gill damage and HSMI.

Cleanerfish mortality within last 4 weeks : Ballan Wrasse - 44, 1.15%. Lumpfish - 867, 4.36%.
Recent mortality within the last 4 weeks has been mainly attributed to HSMI and treatment losses.

Lice levels on site appeared low upon inspection of the stocks.

Case No:	2024-0281	Site No:	FS0646
Date of Visit:	25/07/2024	Inspector(s):	[redacted]

Registration/Authorisation Details

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

Site Details (include cleaner fish for all sections)

Total No facilities		16	Facilities stocked		6	No facilities inspected		16
Species	SAL	WRS	LUMP					
Age group	2023 Q2	2023	2023					
No Fish	107,919	3,836	19,870					
Mean Fish Wt	3.7Kg	45g	140g					
Next Fallow Date (Site)		08/24		Next Input Date (Site)		10/24		
Recent (last 4 wks) disease problems?			Y	Any escapes (since last visit)?				N
If yes, detail:	HSMI							

Movement Records

1. Movement records available for inspection?	Y
2. Date of last inspection:	26/03/2024
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?	Ensiled - on site
If other detail:	Ensiled waste transferred to whiteshore cockles
3. Mortality records complete and correctly entered?	Y
4. Recent mortality (last 4 wks):	Week 30 (782, 0.72%), Week 29 (2,198, 1.77%), Week 28 (2,458, 1.23%), Week 27 (3,350, 1.46%)
5. Evidence of recent increased/atypical mortalities?	Y

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

See additional information.

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)?	Y
If yes, detail:	T.M.S
If other, detail:	
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)?	T.M.S
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).	See additional information

Records checked between:	26/03/2024 - 25/07/2024

Case no:	2024-0281	Site No:	FS0646	Date of visit/ Sampling:	25/07/2024	25/0							
Priority samples:	VI		BA		PA		MG		HI				
Time sampling starts/ends:	11:15:00	12:17:00	Inspector:		VMD No.	0							
Environmental conditions:	1	Indoors	2		3		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	P1	P1	P1	P1	P1							
Stock Details	Species	SAL	SAL	SAL	SAL	SAL							
	Average weight	3.7Kg	3.7Kg	3.7Kg	3.7Kg	3.7Kg							
	Sex	N/A	N/A	N/A	N/A	N/A							
	Water Type	SW	SW	SW	SW	SW							
	Stock Origin	Hellisay (FS1261)	Hellisay (FS1261)	Hellisay (FS1261)	Hellisay (FS1261)	Hellisay (FS1261)							
	Facility No	3	3	14	6	6							

07/2024 Additional Sample Information:

5 Total Tests assigned 3

Case no: 2024-0281 Site No: FS0646 Method of killing: Percussive

Date of visit: 25/07/2024 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)				5	20	35					
External Signs											
Behaviour	Moribund	S	M	M	M	M					
	Lethargic	S	S	S	S	S					
	Hanging vertical	S									
	Spiralling										
	Flashing										
	Loss of equilibrium										
Body	Dark	M			W						
	Distended abdomen										
	Anorexic	M			W						
	Scale Oedema										
Opercula	Shortened										
	Flared										
Haemorrhaging	Throat										
	Ventrum										
	Base of fins										
	Elsewhere										
Eyes	Exophthalmic				S						
	Enophthalmic (sunken)	S									
	Cataract										
	Haemorrhagic										
Gills	Pale	M									
	Zoned										
	Necrotic										
Lesions	Flank										
	Elsewhere										
Vent	Inflamed		M	M		M					
	Trailing faeces										
Lice Load	Estimate numbers	2	2	1	3	1					
Internal Signs											
Ascites	Clear	M	M	M	W	M					
	Bloody										
Oedema	In tissues										
Heart	Pale/anaemic										
	Granulomas										
	Deformed										
Liver	Petechial haem										
	Gross haem										
	Tissue breakdown										
	Enlarged										
	Colour number(s)	5	3	5	4	3					
	Granulomas										
	Lesions										
Pyloric caeca	Petechial haem			M		W					
	Tubules mauve										
	Lack of fat	W				W					
Spleen	Enlarged										
	Granulomas										
Gut	No food present	S	S	S	S	S					
	Yellow pseudo-faeces										
	External haem										
	Internal haem			M							
Body wall	Haemorrhaging			W							
Swim bladder	Haemorrhaging										
	Fluid filled		W	M		S					
Kidney	Swollen										
	Grey										
	Granular										
	Liquefied										
General	Parasites present										
	Anaemia										

Case no: 2024-0281

Date of visit: 25/07/2024

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:

Site No: FS0646

Case No: 2024-0281

Nature of non-compliance:

Action taken (FHI):

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

Case No: 2024-0281 Date of visit: 25/07/2024

Site No: FS0646 Inspector: [redacted]

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2nd Insp
MG AGD	4/5	01/08/2024		30/07/2024		29/08/2024		
MG IHN	0/5	01/08/2024		30/07/2024		29/08/2024		
MG PARA_THER_Q	5/5	01/08/2024		30/07/2024		29/08/2024		
MG SAL POX	2/5	01/08/2024		30/07/2024		29/08/2024		
MG SAV	4/5	01/08/2024		30/07/2024		29/08/2024		
MG IPN	4/5	01/08/2024		30/07/2024		29/08/2024		
MG ISA	0/5	01/08/2024		30/07/2024		29/08/2024		
MG PMCV	0/5	01/08/2024		30/07/2024		29/08/2024		
MG VHS	0/5	01/08/2024		30/07/2024		29/08/2024		
MG PRV	5/5	07/08/2024		07/08/2024		29/08/2024		
NSIG	3/5	29/08/2024		29/08/2024		30/08/2024		
YRUK	4/5	29/08/2024		29/08/2024		30/08/2024		
HPAT	5/5	29/08/2024		29/08/2024		30/08/2024		
EPIT	1/5	29/08/2024		29/08/2024		30/08/2024		
LPAT	4/5	29/08/2024		29/08/2024		30/08/2024		
GPAT	5/5	29/08/2024		29/08/2024		30/08/2024		
MPAT	2/5	29/08/2024		29/08/2024		30/08/2024		
SPAT	3/5	29/08/2024		29/08/2024		30/08/2024		
SALH	5/5	29/08/2024		29/08/2024		30/08/2024		

Report Summary			
Case Type	Date	Insp	2nd Insp
DIG, REP	29/08/2024		

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS NO	FB0119	**DATE OF VISIT**	25/07/2024
SITE NO	FS0646	**SITE NAME**	Soay
CASE NO	20240281	**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.

Histopathology examination revealed features of necrotising myocarditis, myositis and splenitis that could be related to viral infection. Coagulative hepatic necrosis was also observed. Molecular testing confirmed the presence of salmonid alphavirus.

Yersinia ruckeri was identified on plates taken from kidney material. The level and purity would suggest that it would be implicated in morbidity.

Five fish tested positive for piscine orthorevirus, the causative agent of heart and skeletal muscle inflammation (HSMI) and *Paranucleospora theridion* by qPCR. Four fish tested positive for *Neoparamoeba perurans*, salmonid alphavirus and infectious pancreatic necrosis virus and two fish tested positive for salmon gill poxvirus by qPCR.

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 mortality by the farm operator. At the time of visit the site was stocked with 107,919 Atlantic salmon at an average weight of 3.7kg.

Mortality in the weeks leading up to the date of inspection was mainly being attributed to HSMI and treatment losses. On the date of inspection fish were observed residing deep within the pens. The majority of the population were observed shoaling well however a small population in each pen presented as slightly lethargic. Two fish from pen 6, two fish from pen 3 and one fish from pen 14 were observed displaying clinical signs of disease and were removed for diagnostic sampling.

All fish sampled presented lethargic and moribund prior to removal for sampling. Externally, lice counts were observed as low with only 1 – 3 lice per fish observed of all stages. F1 and F4 had a dark body colour and were anorexic. The eyes of F1 were enophthalmic and the eyes of F4 were exophthalmic. The gills of F1 were pale and the vent of F2, F3 & F5 was inflamed.

UKAS Accredited Inspection Body - Type C No. 0269
Marine Laboratory, 375 Victoria Road, Aberdeen, AB11 9DB
Tel – 0131 244 3498 Email – ms.fishhealth@gov.scot
Website - https://www.gov.scot/policies/fish-health-inspectorate/

Internally, all fish sampled had clear ascites within the body cavity. Petechial haemorrhaging of the pyloric caeca was observed in F3 and F5. F1 and F5 also had a lack of fat present on the pyloric caeca. No food within the gut was observed in any of the fish sampled. The swim bladder of F2, F3 and F5 was fluid filled. F3 displayed signs of internal haemorrhaging of the gut and haemorrhaging to the body wall.

Samples

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

Fish number	Facility number	Species	Stage	Origin
F1 – F2	3	Atlantic Salmon	2023 Q2, 3.7kg	Hellisay (FS1261)
F3	14	Atlantic Salmon	2023 Q2, 3.7kg	Hellisay (FS1261)
F4 – F5	6	Atlantic Salmon	2023 Q2, 3.7kg	Hellisay (FS1261)

Results

Bacteriology: Kidney and gill material from five fish was inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated:

- *Yersinia ruckeri* : F1 – F5 (Kidney)

From the tests conducted for *Yersinia ruckeri* we have evidence which may indicate some resistance to oxytetracyline, however, there was no evidence of resistance to sulphamethoxazole/trimethoprim, amoxycillin 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).

Salmon gill poxvirus

Fish Number	**Endogenous control Cp value**	**Cp Values**			**Reported Result (PCR)**
F1	-	-	-	-	Negative
F2	-	-	-	-	Negative
F3	18.34	35.04	35.09	34.32	POSITIVE
F4	19.01	34.22	33.30	34.36	POSITIVE
F5	-	-	-	-	Negative

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Salmonid alphavirus (SAV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	-	-	-	-	Negative
F2	14.85	25.95	25.76	25.79	POSITIVE
F3	16.82	32.62	33.66	33.24	POSITIVE
F4	16.55	32.44	32.51	32.25	POSITIVE
F5	15.75	27.15	27.27	27.19	POSITIVE

Infectious pancreatic necrosis virus (IPNV)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	15.68	34.50	34.90	33.94	POSITIVE
F2	-	-	-	-	Negative
F3	16.82	38.51	38.25	36.25	POSITIVE
F4	16.55	35.76	35.63	35.60	POSITIVE
F5	15.75	32.20	32.27	32.74	POSITIVE

Piscine orthoreovirus (HSMI)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	15.48	37.79	38.82	36.60	POSITIVE
F2	15.29	35.32	34.33	35.20	POSITIVE
F3	16.68	36.49	36.77	36.12	POSITIVE
F4	16.33	35.95	38.26	36.60	POSITIVE
F5	15.51	37.74	37.11	35.93	POSITIVE

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious salmon anaemia virus (ISAV), viral haemorrhagic septicemia virus (VHSV) and piscine myocarditis virus (PMCV).

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	18.79	33.47	33.97	33.72	POSITIVE
F2	-	-	-	-	Negative
F3	18.34	35.40	34.91	35.09	POSITIVE
F4	19.01	31.67	31.81	32.01	POSITIVE
F5	18.72	32.08	31.60	31.61	POSITIVE

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Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	18.79	31.91	31.67	31.87	POSITIVE
F2	19.25	36.27	36.69	38.24	POSITIVE
F3	18.34	29.29	30.03	29.61	POSITIVE
F4	19.01	29.99	30.32	30.14	POSITIVE
F5	18.72	26.18	26.58	26.57	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: Some lamellar epithelial hyperplasia and fusion (F1-F5). Several basophilic epithelial inclusions (likely epitheliocystis) observed in F4. Few lamellar telangiectasia with multifocal thrombosis (F2-F5). Some post-mortem artefacts also observed.

Skin & Muscle: White musculature inflammation and fibre necrosis, very mild to mild, multifocal (F2, F3).

Heart: Ranging from mild to marked and from multifocal to diffuse, necrotising myocarditis (F1-F5). F5 also displayed 2 areas basophilic nests at compact/spongy layer junction. Epicarditis, mild (F2, F4).

Gut and pyloric caeca: Peritonitis, mild (F1, F2, F5). Some cell sloughing (potentially associated with post-mortem artefact) observed in F3 & F5.

Pancreas: Within the normal range.

Liver: Hepatocellular necrosis, mild, multifocal (F2, F3) to a lesser extension in F4. Some sinusoidal congestion, subcapsular, focal (F1). Hepatocellular vacuolation (macrovesicles), mild, diffuse (F3, F4). Some cuffing (F4). Capsulitis (F3).

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

Signed: [redacted] Date: 30/08/2024

Fish Health Inspector

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)

R09

2024-0281

F1


F1 C3
REF 0508
LOT 6042308
2028-08
Swann-Morton
SHEFFIELD S6 2BJ ENGLAND
DISPOSABLE SCALPEL
2797
UK

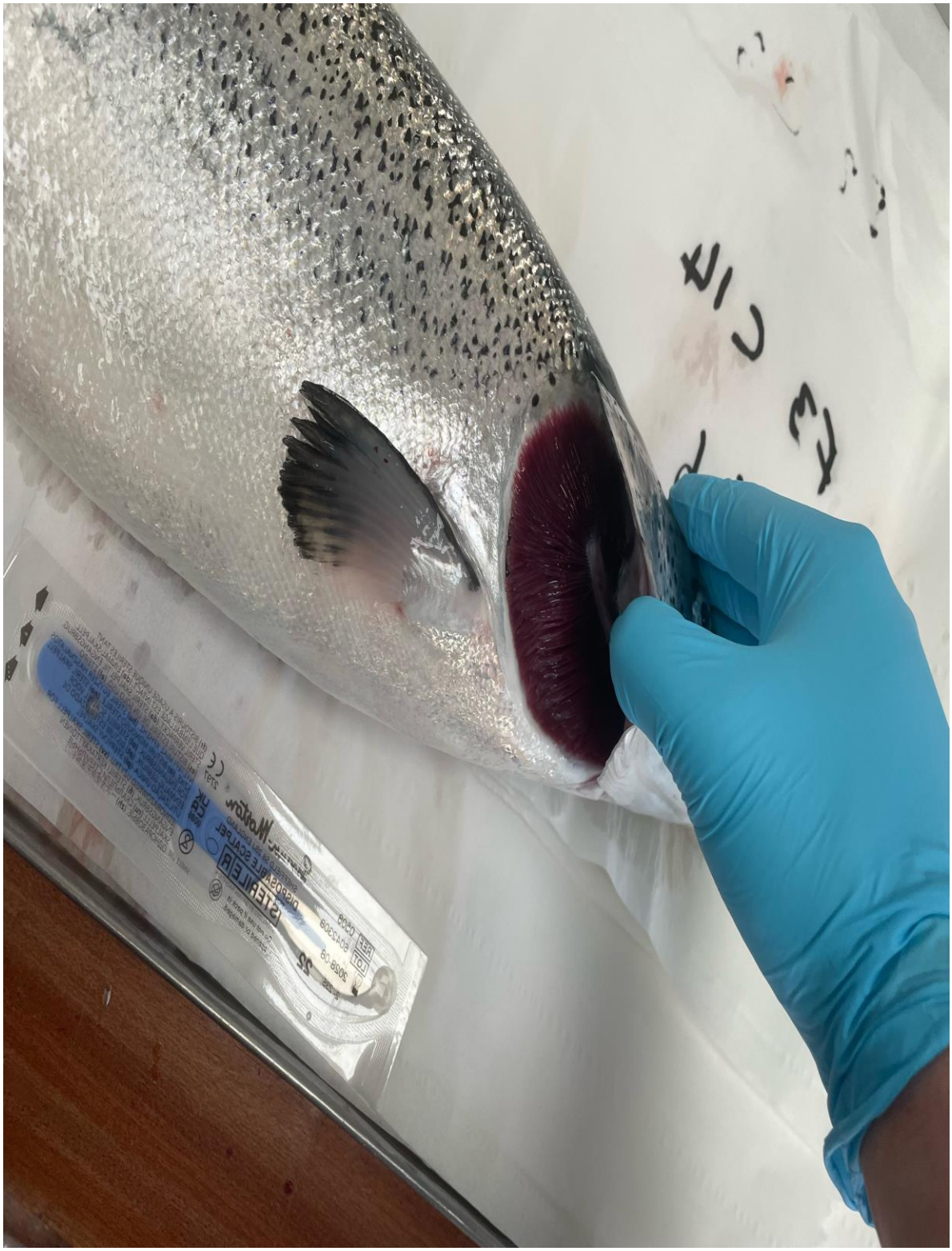

REF 0508
LOT 6042308
2028-08
2- 235
22
Swann-Morton
SHEFFIELD S5 2BJ ENGLAND
DISPOSABLE SCALPEL
STERILE R
2797
UK CA 0086

F2


F2 C3
11:30

STERILE R
Disposable scalpel
Smiths Medical
LOT
REF
0208
S-SSE
SS

F3



STERILE
DISPOSABLE SCALPEL
Gamma-Monitor
0209

F4

STERILEAB
Disposable Scalpel
Sterilized by Ethylene Oxide
Swann-Morton
LOT 6045308
REF 0208
5058-08
SS

F5

12:17
55 cb
REF 0508
LOT 6042308
2028-08
22
2-235