

Case No: 2023-0518 Date of visit: 14/11/2023

Time spent on site: 4h Main Inspector: [Redacted]

Site No: FS1083 Site Name: Groatay
Business No: FB0119 Business Name: Mowi Scotland Ltd

Case Types: 1 REP 2 DIA 3 VMD 4 [] 5 [] 6 []

Water Temp (°C): 10.8 Thermometer No: T173 FHI 045 completed []

Observations: Region: WI Water type: S CoGP MA: W-11

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:
[Redacted]

Additional Case Information:

Salmon peaks in mortalities 2022, wk 39 2,978 (1.25%), wk 40 5,145 (2.19%), wk 41 4,766 (2.07%), wk 43 1,361 (1.15%), wk 44 1,304 (1.36%), wk 45 1,013 (1.07%), wk 47 3,801 (8.52%), Mainly seal predation and pasteurella but some poor doers, CMS and gill health.

Salmon peaks in mortality 2023, wk 39 13,475 (1.46%), wk 40 17,625 (1.94%), wk 41 32,901 (3.70%), wk 42 40,777 (4.76%), wk 43 14,795 (1.81%), wk 44 15,330 (1.69%), AGD the main issue some poor doers in wk 39 also.

Lumpfish peaks in mortality 2023 wk 28 10,280 (8.15%), wk 29 21,970 (18.97%), wk 30 3,913 (4.17%), mainly tenacibaculum.

Wrasse peaks in mortality 2023, wk 39 494 (2.11%), wk 41 687 (3.05%), transport losses and without diagnosis.

Wrasse mortalities last four weeks, wk 44 146 (0.66%) wk 43 297 (1.29%), wk 42 456 (1.95%), wk 41 687 (3.05%).

Lumpfish mortalities last four weeks, wk 44 104 (0.12%), wk 43 111 (0.13%), wk 42 391 (0.46%), wk 41 161 (0.19%).

Paramove 50 was administered in mid August, September and October and freshwater in September and November to treat AGD.

Pisckiricketsia recently identified, anti-biotic to be administered.

A number of moribunds observed in all cages inspected.

Case No: Site No:

Date of Visit: Inspector(s):

Registration/Authorisation Details

1. Business/site details summary checked by site representative?

2. Changes made to details?

Site Details (include cleaner fish for all sections)

Total No facilities	<input type="text" value="14"/>	Facilities stocked	<input type="text" value="14"/>	No facilities inspected	<input type="text" value="14"/>
Species	<input type="text" value="SAL"/>	<input type="text" value="WRS"/>	<input type="text" value="LUM"/>		
Age group	<input type="text" value="2023 q2"/>	<input type="text" value="Mix wild"/>	<input type="text" value="2023"/>		
No Fish	<input type="text" value="857,214"/>	<input type="text" value="22,510"/>	<input type="text" value="83,544"/>		
Mean Fish Wt	<input type="text" value="1.08kg"/>	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>		
Next Fallow Date (Site)	<input type="text" value="August 2024"/>		Next Input Date (Site)	<input type="text" value="March 2025"/>	
Recent (last 4 wks) disease problems?			Any escapes (since last visit)?	<input type="text" value="Y"/>	
If yes, detail:	<input type="text" value="AGD, piscirekettzia"/>				

Movement Records

1. Movement records available for inspection?

2. Date of last inspection:

3. Are records complete and correctly entered?

4. Are movement records available for dead fish and waste?

5. Are records complete and correctly entered?

6. Are health certificates for introductions (outwith GB) available?

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?

2. How are mortalities disposed of?

If other detail:

3. Mortality records complete and correctly entered?

4. Recent mortality (last 4 wks):

5. Evidence of recent increased/atypical mortalities?

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

6. Any other peaks in mortality during period checked?

If yes, detail:

7. Have increased (unexplained) mortalities been reported to vet or FHI?

If yes, detail action:

8. Have 'mortality events' been reported to FHI? If no, enter details on mortality events sheet.

Treatments and Medicines Records

1. Recent treatments (see comment)? Y

If yes, detail:

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)?

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).

Records checked between:

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	6-7	8-9	10-11	11-12			
Pool Group	P1	P1	P1	P1	P1							
Species	SAL	SAL	SAL	SAL	SAL	SAL	SAL	SAL	SAL			
Average weight	1.1kg	1.1kg	1.1kg	1.1kg	1.1kg	1.1kg	1.1kg	1.1kg	1.1kg			
Sex												
Water Type	SW	SW	SW	SW	SW	SW	SW	SW	SW			
Stock Details		Inchmore	Inchmore	Inchmore	Inchmore	Inchmore	Inchmore	Inchmore	Inchmore	Inchmore		
	Stock Origin											
Facility No	31	31	30	30	30	30	27	23	31			

Case no: 2023-0518

Site No: FS1083

Method of killing: Unknown

Date of visit: 14/11/2023

Inspector(s):

Sheet Relevant: Y

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

Fish Number		1	2	3	4	5				
Time sampled after death (if > 45 minutes)										
External Signs										
Behaviour	Moribund	W	W	W	W	W				
	Lethargic	S	S	S	S	S				
	Hanging vertical									
	Spiralling									
	Flashing									
	Loss of equilibrium									
Body	Dark									
	Distended abdomen									
	Anorexic			m						
	Scale Oedema									
Opercula	Shortened									
	Flared									
Haemorrhaging	Throat									
	Ventrum									
	Base of fins									
	Elsewhere									
Eyes	Exophthalmic									
	Enophthalmic (sunken)									
	Cataract									
	Haemorrhagic									
Gills	Pale	W	W	W	S	W				
	Zoned				W					
	Necrotic	S	S	S	S	S				
Lesions	Flank									
	Elsewhere									
Vent	Inflamed									
	Trailing faeces									
Lice Load	Estimate numbers	0	0	0	0	0				
Internal Signs										
Ascites	Clear									
	Bloody									
Oedema	In tissues									
Heart	Pale/anaemic									
	Granulomas									
	Deformed	m	m	m	m	m				
Liver	Petechial haem									
	Gross haem									
	Tissue breakdown									
	Enlarged									
	Colour number(s)	3	3	3	3	3				
	Granulomas									
	Lesions									
Pyloric caeca	Petechial haem									
	Tubules mauve	W		S	W	M				
	Lack of fat	W		S	W					
Spleen	Enlarged	S	M	S	S	S				
	Granulomas			S		M				
Gut	No food present									
	Yellow pseudo-faeces	S	S	S	S	S				
	External haem									
	Internal haem									
Body wall	Haemorrhaging									
Swim bladder	Haemorrhaging									
	Fluid filled									
Kidney	Swollen									
	Grey									
	Granular									
	Liquefied									
General	Parasites present									
	Anaemia									

Case no:

Date of visit:

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

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	Anaemia																		

Additional comments:

Case No: **2023-0518** Date of visit: **14/11/2023**
 Site No: **FS1083** Inspector: **[REDACTED]**

Results Summary	Freq.	Date of Notification						
		Database	Insp	Phone	Insp	Writing	Insp	2 nd Insp
VHS (PCR) - VHSP	0/5	22/11/2023		22/11/2023		15/12/2023		
IHN (PCR) - IHNP	0/5	22/11/2023		22/11/2023		15/12/2023		
ISA (real time qPCR - heart & kidney) - ISAQ	0/5	22/11/2023		22/11/2023		15/12/2023		
AGD (Neoparamoeba perurans) (PCR) - AGDQ	4/5	22/11/2023		22/11/2023		15/12/2023		
IPN (PCR) - IPNM	0/5	22/11/2023		22/11/2023		15/12/2023		
Paranucleospora theridion (PCR) - PNST	5/5	22/11/2023		22/11/2023		15/12/2023		
Piscine myocarditis virus (CMS) (PCR) - PMVP	0/5	22/11/2023		22/11/2023		15/12/2023		
Salmon gill poxvirus (PCR) - SPVP	4/5	22/11/2023		22/11/2023		15/12/2023		
Salmonid alphavirus (SAV) (PCR) - SALP	0/5	22/11/2023		22/11/2023		15/12/2023		
Vibrio species (culture) - VSPE	5/5	28/11/2023		28/11/2023		15/12/2023		
Epitheliocystis - EPIT	4/5	06/12/2023		06/12/2023		15/12/2023		
Gill pathology - GPAT	5/5	06/12/2023		06/12/2023		15/12/2023		
Heart pathology - HPAT	5/5	06/12/2023		06/12/2023		15/12/2023		
Kidney pathology - KPAT	5/5	06/12/2023		06/12/2023		15/12/2023		
Spleen pathology - SPAT	4/5	06/12/2023		06/12/2023		15/12/2023		
Piscirickettsia salmonis (SRS) (histology) - PISH	4/5	06/12/2023		06/12/2023		15/12/2023		

Report Summary			
Case Type	Date	Insp	2 nd Insp
DIA	15/12/2023		

FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

BUSINESS No FB0119 **DATE OF VISIT** 14/11/2023
SITE No FS1083 **SITE NAME** Groatay
CASE No 20230518 **INSPECTOR** ██████████

Section 1: Summary

The above site was inspected following reports of increased mortalities. A number of lethargic and moribund fish were observed in all of the pens, five were removed for further examination and subsequent diagnostic sampling.

Histopathology examination revealed very mild gill pathology and pathology consistent with salmonid rickettsial septicaemia (SRS).

Samples tested positive for the gill related pathogens: *Paranucleospora theridion*, salmon gill poxvirus (SGPV) and *Neoparamoeba perurans* (AGD).

Vibrio sp. was identified on plates taken from kidney material, the level of bacterial growth is significant however the purity of growth would not suggest that these bacteria would be the primary source of morbidity.

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

Elevated mortalities had been reported to the FHI since week 39 and peaking in week 42, mortalities have reduced but continue to remain elevated. On inspection of the stocks lethargic and moribund fish were observed in all cages, five were removed for further examination and diagnostic sampling.

All fish samples were lethargic and moribund with F3 appearing anorexic. The gills of all fish were pale and necrotic with zoning noted in F4.

Internally, the hearts of all fish appeared deformed with splenomegaly and yellow pseudo faeces evident. The pyloric caeca of F1, 3, 4 and 5 lacked fat and the tubules were mauve in appearance. Granulomas were observed on the spleen of F3 and 4.

Samples

Samples were collected from F1-5 according to the table below:

Fish number	Facility number	Species	Stage	Origin
F1-2	31	Atlantic salmon	1.1kg 2023 Q2	Inchmore
F3-5	30	Atlantic salmon	1.1kg 2023 Q2	Inchmore

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Results

Bacteriology: Kidney and gill material from F1-5 were inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated:

- *Vibrio* sp. (isolate A) (kidney F1-5)
- *Vibrio* sp. (isolate B) (kidney F1-2 and F4-5)
- *Vibrio* sp. (isolate C) (kidney F1, 4 and 5)

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	20.97	30.02	30.11	30.01	POSITIVE
F2	20.68	33.00	33.09	33.02	POSITIVE
F3	-	-	-	-	Negative
F4	20.08	31.92	32.23	32.17	POSITIVE
F5	19.95	31.81	31.75	31.89	POSITIVE

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious pancreatic necrosis virus (IPNV), infectious salmon anaemia virus (ISAV), salmonid alphavirus (SAV), 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).

Paranucleospora theridion

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	20.97	23.98	24.08	24.06	POSITIVE
F2	20.68	26.66	26.78	26.64	POSITIVE
F3	20.78	27.87	28.17	28.10	POSITIVE
F4	20.08	23.11	24.17	24.00	POSITIVE
F5	19.95	25.17	25.23	25.30	POSITIVE

Neoparamoeba perurans (AGD)

Fish Number	Endogenous control Cp value	Cp Values			Reported Result (PCR)
F1	20.97	32.14	32.09	32.49	POSITIVE
F2	-	-	-	-	Negative
F3	20.78	27.68	28.72	28.90	POSITIVE
F4	20.08	29.07	29.22	29.86	POSITIVE

F5	19.95	28.00	27.79	28.02	POSITIVE
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Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from F1-5. The tissue samples were fixed in 10% neutral buffered formalin.

Histopathological examination revealed the following:

Gill: Filament hyperplasia and lamellar fusion some to minor, multifocal (F1, F5), F2 displayed some filament tip bluntness and F4 some lamellar adhesions, few basophilic epithelial inclusions (likely epitheliocystis) (F1, F2, F3, F5). Lamellar telangiectasia with multifocal thrombosis (F3, F4) and free blood among gill filaments (F5).

Skin & Muscle: Within normal range.

Heart: Mild, epicarditis (F1, F2, F3, F5) with round blue structures resembling bacteria (likely *Piscirickettsia* sp.) (F4, F5) F2 also displayed a small granuloma-like structure within the ventricle and F3 displayed a mild, multifocal, myositis.

Gut and pyloric caeca: Peritonitis, mild to moderate, multifocal (F1-F5), some fish also displayed necrosis. Presence of few round blue structures resembling bacteria that stained Gram-negative (likely *Piscirickettsia* sp.) (F1, F2, F4, F5). F2, F5 some granulomatous reaction with some structures showed centrally splendore-hoepli reaction (homogeneous eosinophilic material).

Liver: Capsulitis (F4) with (F1) and few round blue structures resembling bacteria that stained Gram-negative (likely *Piscirickettsia* sp.) (F4). Hepatocellular necrosis, minimal, focal (F1, F3) with a few round blue structures resembling bacteria (likely *Piscirickettsia* sp.) (F1).

Kidney: Interstitial cell (haemopoietic) necrosis, mild to marked, multifocal (F1, F2, F3, F4) with a few intracellular round blue structures resembling bacteria that stained Gram-negative (likely *Piscirickettsia* sp.) (F1, F2, F4) and F5 displayed increased numbers of eosinophilic granular cells. Some renal tubules display some hyaline droplets (F2, F3, F4, F5).

Spleen: Necrotising capsulitis (F1, F2, F4, F5) with few round blue structures resembling bacteria that stained Gram-negative (likely *Piscirickettsia* sp.) (F1, F2, F4, F5). F1 some granulomatous reaction with some structures showed centrally splendore-hoepli reaction (homogeneous eosinophilic material). Some erythrocytrophagocytosis observed in F1 and F5. F5 displayed increased numbers of eosinophilic granular cells and F2 to a lesser extent.

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

Signed:



Date: 12/12/2023

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 \(www.gov.scot\)](https://www.gov.scot/policies/fish-health-inspectorate/)

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