

Case No: 2022-0280 Date of visit: 26/07/2022

Time spent on site: 3.5h Main Inspector:

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

Case Types: 1 DIA 2 3 4 5 6

Water Temp (°C): 13.7 Thermometer No: T310 FHI 045 completed N/A

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:

Additional Case Information:

Physical site inspection and paper work conducted by [REDACTED], observed by [REDACTED].

Sampling conducted by [REDACTED] & [REDACTED], F1 and F2 by [REDACTED] and F3 by [REDACTED].

The site was visited in response to sustained elevated levels of mortality above the reporting criteria. CMS and AGD confirmed onsite.

11 cages currently stocked, 6 pens of ex Stulaigh stock and 5 pens of ex Grey Horse Channel Outer Stofnfiskur stock.

Visibility on the date of inspection was good, fish were observed feeding deep. Numbers of lethargic and moribund fish were observed in pens 33, 31 and 30, 3 fish were sampled for a diagnostic.

The site recently treated with freshwater on 08/07/2022.

Multiple sightings of seals near the cages during the inspection on site at Groatay. Nylon nets currently in use, the site have plans in place to put in seal pro nets. Seal colony nearby. Site is experiencing seal predation.

During physical inspection of the site, a loose bullet casing was found on the walkway of pen 32. The casing was removed from the site and passed onto Marine Scotland Compliance.

Case No: **2022-0280** Site No: **FS1083**
 Date of Visit: **26/07/2022** 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 | 14 | Facilities stocked | 11 | No facilities inspected | 4 |
| Species | SAL | SAL | | | |
| Age group | Q2 2021 | Q4 2021 | | | |
| No Fish | 343,614 | 247,286 | | | |
| Mean Fish Wt | 3.4kg | 2.5kg | | | |
| Next Fallow Date (Site) | October 2022 | | Next Input Date (Site) | April 2023 | |
| Recent (last 4 wks) disease problems? | | | Y | Any escapes (since last visit)? | N |
| If yes, detail: | CMS and AGD confirmed onsite. | | | | |

Movement Records

1. Movement records available for inspection? **Y**
 2. Date of last inspection: **05/10/2021**
 3. Are records complete and correctly entered? **N**
 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)? **[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: **Whiteshore cockles**
 3. Mortality records complete and correctly entered? **Y**
 4. Recent mortality (last 4 wks): **Week 30 (3,933, 0.79%) Week 29 (10,912, 1.82%), Week 28 (19,127, 3.09%)
 Week 27 (15,280, 2.65%).**
 5. Evidence of recent increased/atypical mortalities? **Y**
 If yes, facility nos/no mortality per facility/no stock per facility/reason:
Increased mortality attributed to gill issues and CMS.
 6. Any other peaks in mortality during period checked? **Y**
 If yes, detail: **Week 25 (9,660, 1.76%), Week 26 (8,170, 1.64%)**
 7. Have increased (unexplained) mortalities been reported to vet or FHI? **N/A**
 If yes, detail action: **[REDACTED]**
 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: | H2O2 | |
| If other, detail: | TMS | |
| 2. Medicines records available for inspection? | | Y |
| 3. Are records complete and correctly entered? | | Y |
| 4. Are fish in a withdrawal period? | | N |
| 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 <i>increased (unexplained)</i> 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 <i>how</i> and <i>when</i> 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). | AGD and CMS confirmed onsite. | |
| PatoGen report 1/3/22 for Groatay. Stock from GHCO last visit at that site report dated 16/6/22 in house health report, main factors contributing to mortality CGD and seal attacks. | | |
| Records checked between: | 05/10/2021 - 26/07/2022 | |

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 | | | | | | | | | |
| | Fish nos | 1 | 2 | 3 | | | | | | | | | |
| | Pool Group | P1 | P1 | P1 | | | | | | | | | |
| Stock Details | Species | SAL | SAL | SAL | | | | | | | | | |
| | Average weight | 2.5kg | 2kg | 2.5kg | | | | | | | | | |
| | Sex | N/A | N/A | N/A | | | | | | | | | |
| | Water Type | SW | SW | SW | | | | | | | | | |
| | Stock Origin | Grey Horse Channel Outer | Grey Horse Channel Outer | Grey Horse Channel Outer | | | | | | | | | |
| | Facility No | 33 | 33 | 30 | | | | | | | | | |

Case no: 2022-0280

Site No: FS1083

Method of killing: Percussive

Date of visit: 26/07/2022

Inspector(s):

Sheet Relevant: Y

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

| Fish Number | | F1 | F2 | F3 | | | | | | |
|--|-----------------------|----|----|----|----|--|--|--|--|--|
| Time sampled after death (if > 45 minutes) | | | | | | | | | | |
| External Signs | | | | | | | | | | |
| Behaviour | Moribund | S | S | S | | | | | | |
| | Lethargic | S | S | S | | | | | | |
| | Hanging vertical | | | | | | | | | |
| | Spiralling | | | | | | | | | |
| | Flashing | | | | | | | | | |
| Loss of equilibrium | | | | | | | | | | |
| Body | Dark | S | | W | | | | | | |
| | Distended abdomen | | | | | | | | | |
| | Anorexic | | | W | | | | | | |
| | Scale Oedema | | | | | | | | | |
| Opercula | Shortened | | W | | | | | | | |
| | Flared | | | | | | | | | |
| Haemorrhaging | Throat | | | | | | | | | |
| | Ventrum | | | | | | | | | |
| | Base of fins | | | | | | | | | |
| Elsewhere | | | | | | | | | | |
| Eyes | Exophthalmic | | | | | | | | | |
| | Enophthalmic (sunken) | | | | | | | | | |
| | Cataract | M | | | | | | | | |
| | Haemorrhagic | | | | | | | | | |
| Gills | Pale | S | W | M | | | | | | |
| | Zoned | W | M | M | | | | | | |
| | Necrotic | | | | | | | | | |
| Lesions | | | | | | | | | | |
| Flank | | | | | | | | | | |
| Elsewhere | | | | | | | | | | |
| Vent | | | | | | | | | | |
| Inflamed | | | | | | | | | | |
| Trailing faeces | | | | | | | | | | |
| Lice Load | Estimate numbers | | 15 | 25 | 35 | | | | | |
| Internal Signs | | | | | | | | | | |
| Ascites | Clear | | | | | | | | | |
| | Bloody | | | M | | | | | | |
| Oedema | In tissues | | | | | | | | | |
| Heart | Pale/anaemic | | | | | | | | | |
| | Granulomas | | | | | | | | | |
| | Deformed | | | | | | | | | |
| Liver | Petechial haem | | | | | | | | | |
| | Gross haem | | | | | | | | | |
| | Tissue breakdown | | | | | | | | | |
| | Enlarged | | | | | | | | | |
| | Colour number(s) | | 7 | 4 | 5 | | | | | |
| Granulomas | | | | | | | | | | |
| Lesions | | | | | | | | | | |
| Pyloric caeca | Petechial haem | | | | | | | | | |
| | Tubules mauve | | | | | | | | | |
| | Lack of fat | | | | | | | | | |
| Spleen | Enlarged | | | | | | | | | |
| | Granulomas | | | | | | | | | |
| Gut | No food present | | | | | | | | | |
| | Yellow pseudo-faeces | S | | S | | | | | | |
| | External haem | | | | | | | | | |
| | Internal haem | | | | | | | | | |
| Body wall | Haemorrhaging | | | | | | | | | |
| Swim bladder | Haemorrhaging | | | M | | | | | | |
| | Fluid filled | | | | | | | | | |
| Kidney | Swollen | | | | | | | | | |
| | Grey | | | | | | | | | |
| | Granular | | | | | | | | | |
| | Liquefied | | | | | | | | | |
| General | Parasites present | | | | | | | | | |
| | Anaemia | | W | | | | | | | |

Additional comments:

F3 snout damaged

Site No: FS1083

Case No: 2022-0280

Nature of non-compliance:

Action taken (FHI):

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

Case No: **2022-0280** Date of visit: **26/07/2022**
 Site No: **FS1083** Inspector: **[REDACTED]**

| Results Summary | Freq. | Date of Notification | | | | | | |
|-----------------|-------|----------------------|------|------------|------|------------|------|----------------------|
| | | Database | Insp | Phone | Insp | Writing | Insp | 2 nd Insp |
| MG_SAL_POX | 3/3 | 02/08/2022 | | 02/08/2022 | | 25/08/2022 | | |
| MG_PARA_THER_Q | 3/3 | 02/08/2022 | | 02/08/2022 | | 25/08/2022 | | |
| MG_AGDQ | 3/3 | 02/08/2022 | | 02/08/2022 | | 25/08/2022 | | |
| MG-PMCV | 3/3 | 05/08/2022 | | 05/08/2022 | | 25/08/2022 | | |
| MG-SAV | 2/3 | 05/08/2022 | | 05/08/2022 | | 25/08/2022 | | |
| MG-ISA | 0/3 | 05/08/2022 | | 05/08/2022 | | 25/08/2022 | | |
| MG-IHN | 0/3 | 05/08/2022 | | 05/08/2022 | | 25/08/2022 | | |
| MG-VHS | 0/3 | 05/08/2022 | | 05/08/2022 | | 25/08/2022 | | |
| MG-IPN | 1/3 | 05/08/2022 | | 05/08/2022 | | 25/08/2022 | | |
| MG_YER_RUCK | 3/3 | 16/08/2022 | | 16/08/2022 | | 25/08/2022 | | |
| HPAT | 3/3 | 17/08/2022 | | | | 25/08/2022 | | |
| SPAT | 1/3 | 17/08/2022 | | | | 25/08/2022 | | |
| KPAT | 2/3 | 17/08/2022 | | | | 25/08/2022 | | |
| PMCH | 2/3 | 17/08/2022 | | | | 25/08/2022 | | |
| CMPS | 3/3 | 17/08/2022 | | | | 25/08/2022 | | |
| MG-PSKY | 0/1 | 17/08/2022 | | | | 25/08/2022 | | |
| YRUK | 2/3 | 19/08/2022 | | | | 25/08/2022 | | |
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| Report Summary | | | |
|----------------|------------|------|----------------------|
| Case Type | Date | Insp | 2 nd Insp |
| DIA | 25/08/2022 | | |
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FISH HEALTH INSPECTORATE VISIT REPORT

SUMMARY FOR INFORMATION OF SITE OPERATOR

| | | | |
|--------------------|----------|----------------------|------------|
| BUSINESS No | FB0119 | DATE OF VISIT | 26/07/2022 |
| SITE No | FS1083 | SITE NAME | Groatay |
| CASE No | 20220280 | INSPECTOR | [REDACTED] |

Section 1: Summary

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

Histopathological examination revealed pathology consistent with cardiomyopathy syndrome (CMS), chronic nephritis and chronic splenitis. The features of chronic lesion maybe associated with bacterial infection or another agent. Samples confirmed piscine myocarditis virus (PMCV) (3/3) by qPCR.

Yersinia ruckeri was identified on plates taken from F1 & F3. *Yersinia ruckeri* is a primary fish pathogen, however, the level and purity of growth would not suggest that this isolate would be implicated as a source of morbidity in this case. Samples tested positive for segments of nucleic acid indicative of the presence of *Yersinia ruckeri* using real-time PCR (qPCR) for all three fish.

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 for Groatay and Grey Horse Channel Outer. The fish from Grey Horse Channel Outer had been transferred to Groatay in June 2022. At the time of the visit the site was stocked with 2021 Q4 stock at an average weight of 2.5kg from Grey Horse Channel Outer and 2021 Q2 stock at an average weight of 3.4kg originating from Stulaigh. Four pens of stock from Grey Horse Channel Outer were inspected and lethargic and moribund fish were observed. Three fish were selected for diagnostic sampling.

All three fish sampled displayed moribund and lethargic behaviour prior to removal from the pens. Externally, F1 & F3 had a darkened body, F2 had a shortened operculum and F3 was also anorexic. F1 also had a cataract in both eyes. The gills appeared zoned and pale in all three fish. The lice load was between 15-35 lice all stages per fish.

Internally, F3 had bloody ascites and haemorrhaging was evident on the swim bladder. Yellow pseudo-faeces were observed in F1 & F3, while F2 was showing signs of general anaemia.

R09

Samples

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

| Fish number | Facility number | Species | Stage | Origin |
|-------------|-----------------|-----------------|-------------------|--------------------------|
| F1-F2 | 33 | Atlantic salmon | 2021 Q4; 2.5kg | Grey Horse Channel Outer |
| F3 | 30 | Atlantic salmon | 2021 Q4; 2.5kg | Grey Horse Channel Outer |

Results

Bacteriology: Kidney and gill material from F1 –F3 was inoculated onto appropriate media for the isolation of bacteria.

The following bacteria were isolated:

- *Yersinia ruckeri*: F1 & F3 (Kidney)

Yersinia ruckeri

| Fish Number | Endogenous control Cp value | Cp Values | | | Reported Result (PCR) |
|-------------|-----------------------------|-----------|-------|-------|-----------------------|
| F1 | 21.86 | 31.9 | 31.65 | 31.88 | POSITIVE |
| F2 | 21.02 | 36.03 | 37.8 | 36.11 | POSITIVE |
| F3 | 21.59 | 30.86 | 31.01 | 31.16 | POSITIVE |

From the tests conducted, we have evidence which may indicate resistance to amoxicillin, 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 | 16.04 | 33.6 | 33.97 | 33.87 | POSITIVE |
| F2 | - | - | - | - | Negative |
| F3 | - | - | - | - | Negative |

Salmonid alphavirus (SAV)

| Fish Number | Endogenous control Cp value | Cp Values | | | Reported Result (PCR) |
|-------------|-----------------------------|-----------|-------|-------|-----------------------|
| F1 | 16.04 | 23.28 | 22.83 | 26.63 | POSITIVE |
| F2 | 17.13 | 20.13 | 20.22 | 20.27 | POSITIVE |
| F3 | - | - | - | - | Negative |

Piscine myocarditis virus (PMCV)

| Fish Number | Endogenous control Cp value | Cp Values | | | Reported Result (PCR) |
|-------------|-----------------------------|-----------|-------|-------|-----------------------|
| F1 | 16.04 | 24.25 | 24.33 | 24.12 | POSITIVE |
| F2 | 17.13 | 22.44 | 23.26 | 22.67 | POSITIVE |
| F3 | 16.71 | 15.49 | 15.86 | 15.52 | POSITIVE |

Salmon gill poxvirus (SGPV)

| Fish Number | Endogenous control Cp value | Cp Values | | | Reported Result (PCR) |
|-------------|-----------------------------|-----------|-------|-------|-----------------------|
| F1 | 19.47 | 31.23 | 31.27 | 31.47 | POSITIVE |
| F2 | 18.37 | 34.53 | 34.76 | 36.04 | POSITIVE |
| F3 | 19.14 | 29.94 | 30.01 | 29.8 | POSITIVE |

The samples tested negative for infectious haematopoietic necrosis virus (IHNV), infectious salmon anaemia virus (ISAV), and viral haemorrhagic septicaemia 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 | 19.47 | 35.08 | 35.43 | 34.5 | POSITIVE |
| F2 | 18.37 | 32.46 | 32.87 | 32.24 | POSITIVE |
| F3 | 19.14 | 28.07 | 27.89 | 28.17 | POSITIVE |

Paranucleospora theridion

| Fish Number | Endogenous control Cp value | Cp Values | | | Reported Result (PCR) |
|-------------|-----------------------------|-----------|-------|-------|-----------------------|
| F1 | 19.47 | 29.55 | 29.56 | 29.34 | POSITIVE |
| F2 | 18.37 | 26.56 | 26.5 | 26.51 | POSITIVE |
| F3 | 19.14 | 23.63 | 23.52 | 23.58 | POSITIVE |

Histology: Tissue samples of gill, skin and skeletal muscle, heart, pyloric caeca, pancreas, hind gut, liver, spleen and kidney were taken from F1-F3. The tissue samples were fixed in 10% neutral buffered formalin.

Histopathological examination by light microscopy revealed the following:

Gill: Mild, multifocal interlamellar hyperplasia and fusion (F1 & F2) and some inflammatory cell infiltrate circulating in the vessels (F1). One basophilic epithelial inclusion (likely epitheliocystis) observed in F3. One aneurysmal dilation/telangiectasia and free blood among gill filaments (F2). F2, F3 displayed autolysis artefact.

Skin & Muscle: Within the normal range.

Heart: F3 displayed marked myocardial mononuclear cell infiltration (endocarditis) and marked myocardial degeneration and necrosis in the ventricle and atrium chamber. F1 and F2 displayed the same features similar to F3 but milder. Mild, multifocal epicarditis observed in all fish.

R09

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

Gut and pyloric caeca: Marked cellular sloughing potentially associated with autolysis artefacts (F2).

Pancreas: Within normal range.

Liver: Hepatocellular necrosis, mild, multifocal (F1-3), some diffuse hepatocellular vacuolation (macrovisicules) (F1-F3).

Kidney: Granulomatous infiltration with several sparse multinucleated giant cells and centrally splendore-hoepli reaction (homogeneous eosinophilic material) (F3). These features are also observed in F1 but are milder.

Spleen: F3 showed multiple inflammatory cell infiltrate, multifocal, mild, among the parenchyma and associated multinucleated giant cells. Some structures showed centrally splendore-hoepli reaction (homogeneous eosinophilic material).

Signed:



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/>

2022-0280 (FS1083 Groatay)
F1





F2





F3



