

[Scottish Salmon Watch](#), 10 July 2018

Ban Water Torture on Scottish Salmon Farms
- Over 100,000 farmed fish Thermoliced & Hydroliced to death since August 2017



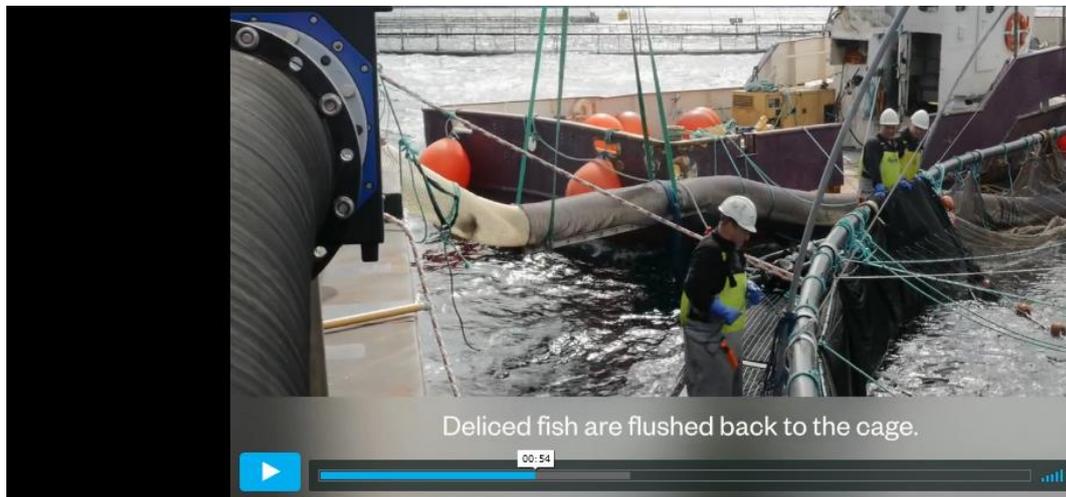
Campaigners are calling for a ban on 'torture chambers' used on salmon farms to kill parasites and treat for diseases. [Data disclosed by the Scottish Government via Freedom of Information](#) (FOI) reveals that over 100,000 farmed salmon died in 14 incidents between August 2017 and January 2018 due to lethal Thermolicer and Hydrolicer treatments [1]. Since 2016, over 230,000 fish have died on Scottish salmon farms following the use of 'mechanical treatments' intended to kill sea lice and treat Amoebic Gill Disease [2].



In 2016, [Compassion In World Farming called for a ban on Thermolicers](#) following a mass mortality of [95,000 farmed salmon at Marine Harvest's salmon farm in Loch Greshornish](#). Earlier this year, Norwegian veterinarian Dr. Kristin Ottesen [warned against the use of the Thermolicer](#) due to the risk of head injury including "large bleeding around the brain" and "stress-induced damage".

A [study published in a Norwegian veterinary journal in May](#) concluded that "the present use and technical solutions for thermal de-lousing are inadequate and likely to cause pain and serious lesions in treated fish". An [English summary of the scientific paper](#) included:

"High mortality and serious lesions associated with thermal sea-lice treatments are of concern in the aquaculture industry. Lesions most commonly observed include gill haemorrhage, scale and skin loss, haemorrhage and vacuolation of thymic tissue, degeneration of nasal epithelium and brain haemorrhage. It is demonstrated beyond doubt that fish can feel pain and that the temperatures used during thermal de-lousing (28-34 °C) are most likely painful to the fish. This pain will also initiate panic reactions where fish are likely to inflict serious self-damage." [3]



Delicing using Thermolicer

More from Steinsvik
Autoplay next video

"The Thermolicer and Hydrolicer are torture chambers for fish," said Don Staniford, Director of [Scottish Salmon Watch](#). "Heating salmon up to 34 degrees Celcius - that's over 90 degrees Fahrenheit - is a welfare nightmare which must be stopped before tens of thousands more fish die a horrible death. These Heath Robinson contraptions act as monstrous washing machines in a desperate and failed attempt to clean tonnes and tonnes of lice-infested and disease-ridden farmed salmon. No wonder fish are dying due to bleeding brains and head damage."

['Mortality Event Reports'](#) reported between August 2017 and January 2018 included 95,751 deaths in 8 separate incidents due to the Thermolicer and/or Hydrolicer:

- 45,089 - Scottish Salmon Company: Druimyeon Bay (Sound of Gigha), 13 November 2017
- 25,607 - Scottish Salmon Company: Druimyeon Bay (Sound of Gigha), 6 November 2017
- 8,737 - Scottish Salmon Company Sgian Dubh (Loch Striven), 11 December 2017
- 4,663 - Marine Harvest: Caolas A Deas (Loch Shell), 21 August 2017
- 4,253 - Scottish Sea Farms: South Sound (Mangaster Voe), 1 January 2018
- 3,546 - Scottish Salmon Company: Strome (Loch Carron), 30 October 2017
- 2,652 - Scottish Salmon Company: Gravir (Loch Odhairn), 30 October 2017
- 1,204 - Scottish Salmon Company: Inch Kenneth (Loch na Keal), 25 December 2017

Another six ['Mortality Event Reports'](#) provided no data on the number of dead fish but at least one incident was reported as "over 1% mortality". The 'Mortality Event Report' (1 January 2018) for The Scottish Salmon Company's salmon farm at Strome in Loch Carron stated that the estimated number of fish lost was "not disclosed" with the: "Company unwilling to disclose the % of the mortality or the number of fish involved. Only the figure is over 1%. Discussions ongoing to get actual figures" (further mortality reports followed on 8 January and 15 January 2018).

According to the [Scotland's Aquaculture database](#), 20,440 kg - that's 20.4 tonnes - of mortalities came from The Scottish Salmon Company's salmon farm at Strome in January 2018. If the average weight of the farmed salmon was 1 kg then there would be over 20,000 morts (even if the average weight of the farmed salmon was 4 kg then there would be over 5,000 morts).

Another mortality incident where no figure is provided started on 7 August 2017 at Marine Harvest's salmon farm at Tabhaigh in Loch Erisort (further mortality reports followed on 14 August and 21 August 2017). According to the [Scotland's Aquaculture database](#), 265,069 kg - that's 265 tonnes - of mortalities came from Marine Harvest's salmon farm at Tabhaigh in Loch Erisort in August 2017 (that could be over 250,000 and most likely over 50,000 morts).

Scottish Salmon Watch has now filed another FOI asking for specific figures.

In May 2016, Marine Harvest Scotland's Managing Director Ben Hadfield [described the Hydrolicer](#) as a "natural solution" for the problems of sea lice and Amoebic Gill Disease. According to Marine Harvest, their [Inter Caledonia Hydrolicer](#) "uses reverse osmosis technology to turn seawater into fresh water at a capacity of 200m³/hour, and will be able to completely fill her wells every ten hours, allowing the fish to be bathed in fresh water, ideal for treating them against sea lice and AGD" [4].



A [Scottish Parliament briefing published in February 2018](#) included:

OTHER METHODS OF CONTROL

Mechanical methods are also used to control lice ¹².

- A thermolicer works by pumping salmon through lukewarm water. Lice have a low tolerance for sudden changes in temperature
- A hydrolicer washes lice off the salmon
- A fish wash or skamik system uses brushes and water spray to remove lice.

However, as [Marine Harvest](#) (2017, p22) note "...new methods generate new challenges, as we experienced at our Greshornish site in Scotland. At Greshornish, we lost 115 283 fish during our first full-scale thermolicer treatment because we lacked experience and failed to fully anticipate the consequences of treating fish compromised by amoebic gill disease with water of up to 34°C."

In May 2018, Scottish Salmon Watch [wrote to the Scottish Ministers](#) raising welfare concerns surrounding the operation of the Thermolicer. The letter cited Compassion In World Farming's [written submission to the Rural Economy & Connectivity Committee's](#) ongoing salmon farming inquiry:

Use of Thermolicers has raised great concern. There are many reports, from both Scotland and Norway, of high levels of fish mortality following Thermolicer treatments. For example, according to Freedom of Information requests, 95,400 fish died over two weeks ending 08/08/16 following Thermolicer treatment at a farm in Loch Greshornish (Isle of Skye)ⁱⁱ. In Norway, this treatment has likewise caused major fish mortalities^{iii, iv}. Despite these incidents, Thermolicer treatments have not been subjected to a full welfare assessment. The process is highly stressful for the salmon and involves crowding, removal from water, and exposure to much warmer water (up to 34 °C which is not in the salmon's natural range) for 30 seconds which is most likely painful to the fish. Salmon do not experience sudden temperature changes like this in the wild and it is physically challenging – if not life-threatening. During this treatment, salmon also suffer injuries such as gill haemorrhage, degeneration of nasal epithelium, vacuolation of thymic tissue, skin, fin and scale damage, brain haemorrhage, lack of oxygen due to crowding and reduced oxygen content of warmer water. Build-up of ammonia can also be an issue. There are also questions over its effectiveness. This is demonstrated by a Norwegian study which found many of the farms using the Thermolicer were back to pre-treatment levels of lice just 3 weeks later^v.

Later this week, Scottish Salmon Watch will be filing a legal challenge against salmon farms for systematic breaches of the Animal Health & Welfare (Scotland) Act 2006.

Read more via:

[Letter to Scottish Ministers re. Welfare Abuses at Scottish Salmon Farms](#)

[Deaths, Deformities & Welfare Abuse at Scottish Salmon Farms - Breach of the Animal Health & Welfare \(Scotland\) Act?](#)

[Letter to the Cross-Party Group on Animal Welfare: Thermoliced to death](#)

[Study questions fish welfare in thermal delousing](#)

[Vet warns of head injury risk to fish during delousing](#)

[Thermal treatment for lice blamed for salmon deaths - new 'Thermolicer' method under spotlight as 6,000 fish die](#)

[Thousands of fish poached alive in lice treatment bungle that could hit Christmas salmon prices](#)

[Thousands of salmon are poached alive when a lice treatment process went horribly wrong in a mistake that could see prices soar ahead of Christmas](#)

[Fish farm firm kills 175000 salmon by accident](#)

[Revealed: how Scottish fish farm cooked thousands of salmon alive](#)

['Thermolicer' Back-Fires Killing 95,400 Farmed Salmon - £2.7 million up in flames for Marine Harvest on Isle of Skye](#)

Last month, Scottish Salmon Watch [published gruesome photos](#) cataloguing serious welfare abuses at salmon farms across Scotland.



Read more via:

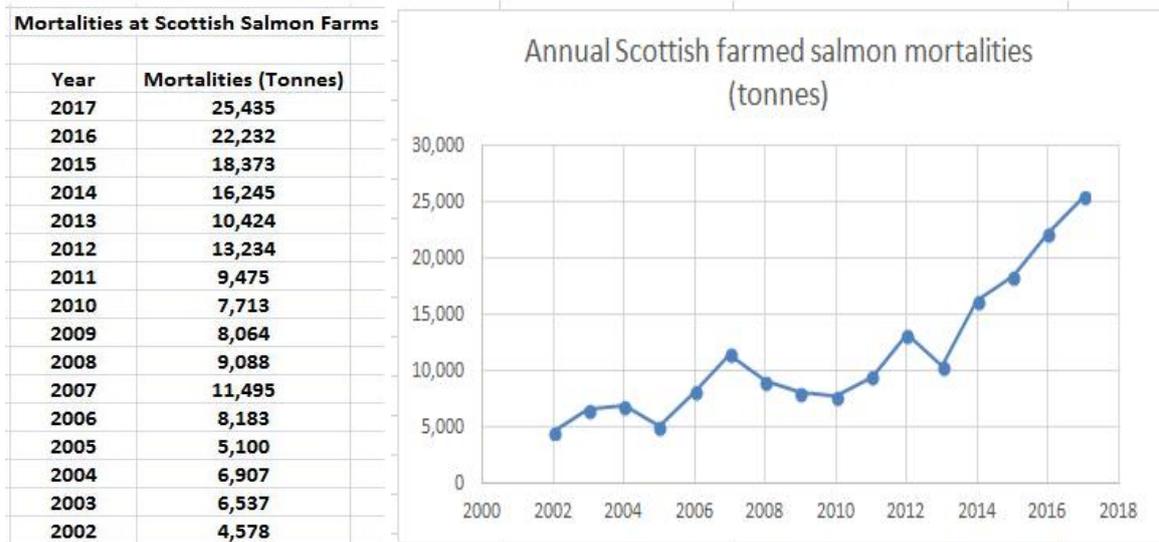
[EXPOSED: Gruesome Photos of Deformed & Diseased Scottish Salmon](#)

[Horror photos of farmed salmon spark legal threat](#)

[GRAPHIC: More Proof That Fish Are Suffering in Food Industry \(Photos\)](#)

[New photos expose shocking welfare issues on Scottish salmon farms](#)

Data published by the Scottish Government via [Scotland's Aquaculture database](#) in March 2018 revealed that mortalities on Scottish salmon farms exceeded 25,000 tonnes in 2017 (up from less than 10,000 tonnes in 2011 and just over 5,000 tonnes in 2005):



Download Excel spreadsheet in full [online here](#)

The BBC's Joe Crowley (who exposed leaking wastes from diseased farmed salmon on [The One Show's 'Dead Salmon Run' in December 2017](#)) [Tweeted](#):

 **Joe Crowley** 
@joe_crowley Following

So, all the 2017 stats are now out for Scottish salmon farming and the fish mortalities are as bad as feared/predicted: just over 25,700 tonnes of dead salmon in 2017. The worst year on record. The highest ever in tonnage and as a % of biomass (salmon farmed). Pretty damning.



4:27 PM - 2 Mar 2018

42 Retweets 33 Likes 

Note that the increase in mortalities cannot be explained simply as a function of an increase in salmon farming production - in fact the ratio of mortalities to salmon farming production is now the worst ever:

Year	Production (t)	Mortalities (t)	P/M	Ratio M:P
2002	144,589	4,578	31.58344255	1:32
2003	169,736	6,537	25.96542757	1:26
2004	158,099	6,907	22.88967714	1:23
2005	129,588	5,100	25.40941176	1:25
2006	131,847	8,183	16.112306	1:16
2007	129,930	11,495	11.30317529	1:11
2008	128,606	9,088	14.15118838	1:14
2009	144,247	8,064	17.88777282	1:18
2010	154,164	7,713	19.98755348	1:20
2011	158,018	9,475	16.67736148	1:17
2012	162,223	13,234	12.25804745	1:12
2013	163,234	10,424	15.65943975	1:16
2014	179,022	16,245	11.02012927	1:11
2015	171,722	18,373	9.346432265	1:9
2016	162,817	22,232	7.323542641	1:7
2017	177,202	25,435	6.966856694	1:7

An Excel spreadsheet of the data for mortalities during 2017 and back to 2002 - including graphs summarising the data - is available [online here](#)

In January 2018, the Cabinet Secretary for Rural Economy (Fergus Ewing) [revealed that the mortality rate on Scottish salmon farms was a staggering 26.7%](#) - with an [estimated 20 million farmed salmon](#) dying each year on Scottish salmon farms.



Read more via:

[Hard Evidence: Dossier of Data on Lice, Diseases & Mortalities at Scottish Salmon Farms](#)
[The Herald: "Video: Disease concern as Scots salmon farmers' produce "stomach-churning" record levels of fish deaths"](#)

[Scottish Salmon's Mort Mountain Leaps Over 10 Million - FOI reveals 2.3 million dead salmon at Marine Harvest farms in 2017](#)

[Photo Gallery: Dead Salmon from Scotland's Disease-Ridden Salmon Farms](#)

Contact:

Don Staniford: 07771 541826 (dstaniford@gaaia.org)

Notes to Editors:

[1] Information supplied by the Scottish Government on 18 June 2018: [FoI-18-01466 - Mortality Event Reports - June 2018](#)

Download the covering letter from the Scottish Government dated 18 June 2018 [online here](#)

'Mortality Event Reports' included 95,751 deaths in 8 separate incidents due to the Thermolicer and/or Hydrolicer:

- 45,089 - Druimyeon Bay (The Scottish Salmon Company), 13 November 2017
- 25,607 - Druimyeon Bay (The Scottish Salmon Company), 6 November 2017
- 8,737 - Sgian Dubh (The Scottish Salmon Company), 11 December 2017
- 4,663 - Caolas A Deas (Marine Harvest), 21 August 2017
- 4,253 - South Sound (Scottish Sea Farms), 1 January 2018
- 3,546 - Strome (The Scottish Salmon Company), 30 October 2017
- 2,652 - Loch Odhairn/Gravir (The Scottish Salmon Company), 30 October 2017
- 1,204 - Inch Kenneth (The Scottish Salmon Company), 25 December 2017

Mortality Event Report	
Mortality Event ID	MRT00529
Site Name:	Druimyeon Bay
Site No:	FS0336
Start date of mortality:	13/11/2017
Period of mortality:	Weekly
Percentage mortality:	8.69
Explained/unexplained:	Explained
Reason (if explained):	post treatment hydrolicer losses, handling, CMS.
Business Name:	The Scottish Salmon Company
Business Number:	FB0169
Species:	SAL
Water Type:	S
Weight (site average):	≥750g
Weight (affected population average):	2.8kg
Age:	2016 S0
Estimated number of fish lost:	45089
Additional information:	further hydrolicer treatment planned, fish on functional feed, harvesting.
MS action:	Site inspection planned for wk 48.

Mortality Event Report

Mortality Event ID MRT00514

Site Name: Druimyeon Bay

Site No: FS0336

Start date of mortality: 06/11/2017

Period of mortality: Weekly

Percentage mortality: 4.44

Explained/unexplained: Explained

Reason (if explained): post treatment hydrolicer losses.

Business Name: The Scottish Salmon Company

Business Number: FB0169

Species: SAL

Water Type: S

Weight (site average): $\geq 750g$

Weight (affected population average): 2.5 kg

Age: 2016 S0

Estimated number of fish lost: 25607

Additional information: further hydrolicer treatment planned, fish on functional feed.

MS action: Site inspection delayed until wk 48, figures updated 23/11/17

Mortality Event Report

Mortality Event ID MRT00550

Site Name: Sgian Dubh

Site No: FS1281

Start date of mortality: 11/12/2017

Period of mortality: Weekly

Percentage mortality: 1.16

Explained/unexplained: Explained

Reason (if explained): Treatment

Business Name: The Scottish Salmon Company

Business Number: FB0169

Species: SAL

Water Type: S

Weight (site average): $\geq 750g$

Weight (affected population average): 2.1kg

Age: 2017 S1

Estimated number of fish lost: 8737

Additional information: 2 x hydrolicer treatments have resulted in scale loss. Vet attending on 22/12/17.

MS action: FHI to monitor situation going forward.

Mortality Event Report

Mortality Event ID: MRT00501

Site Name: Caolas A Deas

Site No: FS1291

Start date of mortality: 21/08/2017

Period of mortality: Weekly

Percentage mortality: 1.89

Explained/unexplained: Explained

Reason (if explained): PGD, Treatment

Business Name: Marine Harvest (Scotland) Ltd

Business Number: FB0119

Species: SAL

Water Type: S

Weight (site average): >750g

Weight (affected population average): ~4.5Kg

Age: 2016 Q3

Estimated number of fish lost: 4663

Additional information: Thermolicer treatment on one cage. Decided not to treat other cages with thermolicer.

MS action: FHI not informed at time. Site inspected 7/11/17.

Mortality Event Report

Mortality Event ID: MRT00584

Site Name: South Sound

Site No: FS0183

Start date of mortality: 01/01/2018

Period of mortality: Weekly

Percentage mortality: 2.19

Explained/unexplained: Explained

Reason (if explained): Physical damage, thermolicer post-treatment

Business Name: Scottish Sea Farms Ltd

Business Number: FB0125

Species: SAL

Water Type: S

Weight (site average): ≥750g

Weight (affected population average): 4.8kg

Age: 2016 S0

Estimated number of fish lost: 4253

Additional information: Storm at site, fish showed damage from rubbing against net. Company biologist attended site, mortalities dropped below 1% following week.

MS action: FHI to monitor

Mortality Event Report
Mortality Event ID: MRT00513

Site Name: Strome
Site No: FS0570
Start date of mortality: 30/10/2017
Period of mortality: Weekly
Percentage mortality: 1.83
Explained/unexplained: Explained
Reason (if explained): post treatment hydrolicer losses.
Business Name: The Scottish Salmon Company
Business Number: FB0169
Species: SAL
Water Type: S
Weight (site average): ≥750g
Weight (affected population average): 3.2kg
Age: 2016 S0
Estimated number of fish lost: 3546
Additional information: Further treatment with salmosan planned
MS action: Site due to fallow early 2018. FHI to monitor situation going forward with view to visiting when inspector in area

Mortality Event Report
Mortality Event ID: MRT00492

Site Name: Loch Odhairn/Gravir
Site No: FS0242
Start date of mortality: 30/10/2017
Period of mortality: Weekly
Percentage mortality: 1.45
Explained/unexplained: Explained
Reason (if explained): post treatment hydrolicer losses.
Business Name: The Scottish Salmon Company
Business Number: FB0169
Species: SAL
Water Type: S
Weight (site average): ≥750g
Weight (affected population average): 2kg
Age: 2016 S0s
Estimated number of fish lost: 2652
Additional information: mortality event considered to be the result of treatment and numbers should reduce next week
MS action: FHI monitoring. Site inspected 16/8/17 and diag samples taken

Mortality Event Report	
Mortality Event ID	MRT00574
Site Name:	Inch Kenneth
Site No:	FS0593
Start date of mortality:	25/12/2017
Period of mortality:	Weekly
Percentage mortality:	1.75
Explained/unexplained:	Explained
Reason (if explained):	Treatment
Business Name:	The Scottish Salmon Company
Business Number:	FB0169
Species:	SAL
Water Type:	S
Weight (site average):	≥750g
Weight (affected population average):	3.8Kg
Age:	2016 S0
Estimated number of fish lost:	1204
Additional information:	Treatment with hydrolicer
MS action:	No further action

Another six 'Mortality Event Reports' provided no data on the number of dead fish but at least one incident was reported as "over 1% mortality":

Mortality Event Report	
Mortality Event ID	MRT00577
Site Name:	Strome
Site No:	FS0570
Start date of mortality:	01/01/2018
Period of mortality:	Weekly
Percentage mortality:	1.92
Explained/unexplained:	Explained
Reason (if explained):	Post hydrolicer treatment
Business Name:	The Scottish Salmon Company
Business Number:	FB0169
Species:	SAI
Water Type:	S
Weight (site average):	≥750g
Weight (affected population average):	
Age:	2016 S0
Estimated number of fish lost:	not disclosed
Additional information:	Company unwilling to disclose the % of the mortality or the number of fish involved. Only that the figure is over 1%.
MS action:	Discussions ongoing to get actual figures. % figure collected during visit to office; 26/3/18

Mortality Event Report
Mortality Event ID: MRT00599
Site Name: Strome
Site No: FS0570
Start date of mortality: 08/01/2018
Period of mortality: Weekly
Percentage mortality: 1.5
Explained/unexplained: Explained
Reason (if explained): Post hydrolicer treatment
Business Name: The Scottish Salmon Company
Business Number: FB0169
Species: SAL
Water Type: S
Weight (site average): ≥750g
Weight (affected population average): 3.5kg
Age: 2016 S0
Estimated number of fish lost: not disclosed
Additional information: % figures now below the reporting threshold.
MS action: % figure collected during visit to office; 26/3/18

Mortality Event Report
Mortality Event ID: MRT00582
Site Name: Strome
Site No: FS0570
Start date of mortality: 15/01/2018
Period of mortality: Weekly
Percentage mortality: 1.63
Explained/unexplained: Explained
Reason (if explained): Post hydrolicer treatment
Business Name: The Scottish Salmon Company
Business Number: FB0169
Species: SAL
Water Type: S
Weight (site average): ≥750g
Weight (affected population average): 3.5kg
Age: 2016 S0
Estimated number of fish lost: not disclosed
Additional information: >1% - numbers expected to drop to below reporting threshold
MS action: % figure collected during visit to office; 26/3/18

Note that the [Scotland's Aquaculture database reports](#) that 20,440 kg - 20.4 tonnes - of mortalities came from The Scottish Salmon Company's salmon farm at Strome in January 2018.

Mortality Event Report

Mortality Event ID: MRT00465

Site Name: Tabhaigh

Site No: FS1297

Start date of mortality: 07/08/2017

Period of mortality: Weekly

Percentage mortality: 3.7

Explained/unexplained: Explained

Reason (if explained): H2O2 and thermolicer treatment

Business Name: Marine Harvest (Scotland) Ltd

Business Number: FB0119

Species: SAL

Water Type: S

Weight (site average): ≥750g

Weight (affected population average): 4.3kg

Age: 2016 Q3 & Q4

Estimated number of fish lost:

Additional information: Vet visited.

MS action: Sister site visited wk 42 - morts now dropped. Wk 41 - 0.05%.

Mortality Event Report

Mortality Event ID: MRT00466

Site Name: Tabhaigh

Site No: FS1297

Start date of mortality: 14/08/2017

Period of mortality: Weekly

Percentage mortality: 6.57

Explained/unexplained: Explained

Reason (if explained): H2O2 and thermolicer treatment

Business Name: Marine Harvest (Scotland) Ltd

Business Number: FB0119

Species: SAL

Water Type: S

Weight (site average): ≥750g

Weight (affected population average): 4.3kg

Age: 2016 Q3 & Q4

Estimated number of fish lost:

Additional information: Vet visited.

MS action: Sister site visited wk 42 - morts now dropped. Wk 41 - 0.05%.

Mortality Event Report
Mortality Event ID: MRT00467
Site Name: Tabhaigh
Site No: FS1297
Start date of mortality: 21/08/2017
Period of mortality: Weekly
Percentage mortality: 2.54
Explained/unexplained: Explained
Reason (if explained): H2O2 and thermolizer treatment
Business Name: Marine Harvest (Scotland) Ltd
Business Number: FB0119
Species: SAL
Water Type: S
Weight (site average): ≥750g
Weight (affected population average): 4.3kg
Age: 2016 Q3 & Q4
Estimated number of fish lost:
Additional information: Vet visited.
MS action: Sister site visited wk 42 - morts now dropped. Wk 41 - 0.05%.

Note that according to the [Scotland's Aquaculture database](#), 265,069 kg - that's 265 tonnes - of mortalities came from Marine Harvest's salmon farm at Tabhaigh in Loch Erisort in August 2017.

[2] [Scottish Parliamentary question and answer in May 2017](#):

**SCOTTISH PARLIAMENT
WRITTEN ANSWER**

15 May 2017

Index Heading: Economy

Donald Cameron (Highlands and Islands) (Scottish Conservative and Unionist Party): To ask the Scottish Government what information it has on how many mortalities of salmon there have been due to the use of mechanical lice treatments on salmon farms in each year since 2007.

S5W-08947

Fergus Ewing:

Information regarding fish farm mortality is collected as part of fish health inspections conducted by Marine Scotland's fish health inspectorate. Case information is published here: <http://www.gov.scot/Topics/marine/Fish-Shellfish/FHI/CaseInformation>

In 2014 the Ministerial Group for Sustainable Aquaculture Farmed Fish Health and Welfare Working Group recommended that mortality over certain thresholds be reported to Marine Scotland's fish health inspectorate. Mortality thresholds were incorporated into the voluntary Code of Good Practice for Scottish Finfish Aquaculture in 2015. The following information provides details of fish mortalities which were reported to the fish health inspectorate and included mechanical lice treatment as one of the reasons for mortality.

Year	Total Mortality
2015	0
2016	115,950
2017	18,995

SCOTTISH GOVERNMENT

Mortality events [reported by the Scottish Salmon Company in 2017](#) include eight cases involving 90,000 dead salmon due to using a Hydrolicer:

Site Name	Start date:	End date:	Mortality rate recorded(%):	If explained, select reason(s):	Total mortality during event	Additional information (e.g. action taken):
Druimyeon Bay	13/11/2017	19/11/2017	8.69	post treatment hydrolicer losses, handling, CMS.	45089	further hydrolicer treatment planned, fish on functional feed, harvesting.
Druimyeon Bay	06/11/2017	12/11/2017	4.44	post treatment hydrolicer losses.	25607	further hydrolicer treatment planned, fish on functional feed.
Sgian Dubh	11/12/2017	17/12/2017	1.16	Treatment	8737	2 x hydrolicer treatments have resulted in scale loss. Vet attending on 22/12/17.
Sgeir Dughall	05/06/2017	11/06/2017	1.21	Treatment	3864	Hydrolicer post-treatment losses,
Sgeir Dughall	19/06/2017	25/06/2017	1.15	Treatment	3229	Hydrolicer post-treatment losses
North Uiskevagh	02/10/2017	08/10/2017	1.64	Severe gill health issues, losses post hydrolicer treatment	2,721	Harvesting
Kenmore Loch Torridon	31/07/2017	04/08/2017	1.75	Treatment	1556	Hydrolicer treatment. Harvesting and general handling may have exacerbated mortalities. No action taken, site due to be harvested out by end of August 2017.
Inch Kenneth	25/12/2017	31/12/2017	1.75	Treatment	1,204	Treatment with hydrolicer

Mortality events reported by [Scottish Sea Farms in 2017](#) include six cases involving over 25,000 dead salmon due to using a Thermolicer:

Site Name	Start date:	End date:	Mortality rate recorded (%):	If explained, select reason(s):	Total mortality during event	Additional information (e.g. action taken):
Nevis C (Ardintigh)	26/06/2017	10/07/2017	1.82	Treatment	5924	Losses arising during sealice treatment using Thermolicer. No underlying condition suspected.
Nevis B	22/05/2017	28/05/2017	1.81	Treatment	5345	Losses from sea lice treatment with thermolicer, no suspected underlying condition
Nevis A	20/02/2017	26/02/2017	1.58	Treatment	4129	Losses following Thermolicer treatment. Thought to be fish weakened by HSMI.
Nevis B	03/07/2017	17/03/2017	1.45	Treatment	3876	Losses arising during sealice treatment using Thermolicer. No underlying condition suspected.
South Sound	01/05/2017	07/05/2017	1.06	Treatment	3460	No action taken. Mortality due to treatment with thermolicer. Mortalities reduced significantly the following week
Nevis B	10/07/2017	17/03/2017	1.23	Treatment	3256	Residual diver clearance of pens related to above Thermolicer treatment on wk27

Mortality events reported by [Marine Harvest in 2017](#) include three cases involving over 20,000 dead salmon due to using a Thermolicer:

Site Name	Start date	End date	Size of fish	Average weight of affected population	Mortality rate recorded (%)	If explained, select reason(s)	If unexplained, select observations:	Total mortality during event (if applicable)	Additional information (e.g. action taken)
Creag an T'Sagairt (Loch Hourm)	19/06/2017	25/06/2017	≥750g	2.75Kg	1.09	Treatment		9331	Thermolicer
Cairidh	05/01/2017	12/01/2017	≥750g	~3kg	1.3	Treatment		8561	Pen 1 and 2 affected post Thermolicer treatment the rest of the site was not treated
Caolas A Deas	21/08/2017	27/08/2017	≥750g	~4.5Kg	1.89	PGD, Treatment		4663	Thermolicer treatment on one cage. Decided not to treat other cages with thermolicer.

Online via: "[Scottish Salmon's Mort Mountain Leaps Over 10 Million - FOI reveals 2.3 million dead salmon at Marine Harvest farms in 2017](#)".

Nearly 100,000 farmed salmon were 'Thermoliced' to death by Marine Harvest during 2016:

Environmental news 06.11.16 29

Revealed: how Scottish fish farm cooked thousands of salmon alive

EXCLUSIVE BY ROB EDWARDS

ONE of the world's largest fish farming companies has accidentally killed more than 173,000 of its tagged salmon in Scotland while trying to treat them for lice and disease, according to internal Government memos.

Blunders by Norwegian multinational Marine Harvest have cost millions of pounds and led to more than 600 tonnes of salmon having to be incinerated. The losses have contributed to a 10 per cent drop in the company's Scottish salmon production.

Campaigners have accused Marine Harvest of treating salmon cruelly, and warn that lice and diseases are "choking the Scottish salmon farming industry to death".

The worst incident took place in July and August on a salmon farm in Loch Greshornish on the Isle of Skye. Some 95,400 fish were killed by a new device called a thermolicer, which is designed to rid salmon of the sea lice that plague them.

But the way it does this – by suddenly immersing fish in water much warmer than they are used to – can also kill the fish themselves. What happened on Skye was explained in a memo on September 12 from government officials to Rural Economy Minister Peter Fraser.

The "sudden temperature change" caused by the thermolicer killed 95 per cent of the lice but also caused "significant mortalities" among the salmon, it said. Officials estimated that the losses cost Marine Harvest more than £2.7 million.

This report highlights the ongoing difficulties and costs faced by industry with regards to sea lice management, concluded the memo, which was released under Freedom of Information law.

Another 26,000 salmon were killed at Loch Greshornish fish farm by other attempts to rid them of sea lice using chemicals. There are concerns that lice are becoming increasingly resistant to chemical treatment.

In a second memo to Fraser on September 26, officials revealed more inadvertent deaths, this time at a Marine Harvest fish farm in Soggy Sound off the Isle of Harris. Earlier that month 60,000 salmon had been killed by hydrogen peroxide used to treat them for amoebic gill disease.

In the last few months, Marine Harvest fish farms in the Hebrides and Wester Ross have suffered a series of outbreaks of gill disease. Hundreds of thousands of dead fish have reportedly been transported to Wigan, near Manchester, to be incinerated.

According to the company's latest quarterly report to investors, its production of salmon in Scotland has dropped by 18 per cent since last year. Costs increased due to "incident-based mortality" that was "mainly related to gill disease and sea lice treatment losses", the report said.

On October 28, the fish farming industry launched a plan to double its business from £1.8 billion this year to £3.6bn by 2030. The plan was backed by fishing, who promised to set up an "industry leadership group".

But the ambition has been dented by anti-fish farm campaigners. "With lice infestation and gill diseases already plaguing salmon farming, this is sheer madness," said Euan Macleod, director of the Global Alliance Against Industrial Aquaculture.

It was identified who obtained the Government memo revealing the accidental deaths. "The Marine Harvest is desperate enough to resort to a deadly doozy thermolicer shows how deep-seated the industry's disease problems are," he said.

The animal welfare group, Compassion in World Farming, described the thermolicer as "a very brutal form of treatment which clearly causes distress and suffering to the fish". It currently opposes its commercial use.

"Killing fish by overheating, whether accidental or not, is strongly inhumane," said the group's chief executive, Philip Lumley.

The Green MSP Mark Ruskell has lodged a parliamentary question asking for a list of fish farming incidents over the last two years.

Marine Harvest pointed out that the salmon killed in the "unfortunate" thermolicer incident had been weakened by gill disease. "We regret any loss of fish and are always mindful of the welfare of the fish and aim to continuously improve our methods to

Lice infestation and gill diseases are plaguing salmon fish farms owned by companies like Norway's Marine Harvest which has operations all over the Western Isles.

Photograph: PA/ David Cheakin

address changing environmental circumstances," said the company's manager Steve Bruckner.

"We have also faced challenges with amoebic gill disease, which is increasing in this part of the world as a result of climate change."

According to the Scottish Salmon Producers' Organisation, "unexpected incidents" can happen with new treatment technology.

"Any growth will be achieved in a sustainable and responsible way," said chief executive Scott Lindsay.

The Scottish Government welcomes new ways of dealing with sea lice that protect the use of antibiotics.

"Industry is undertaking research with a number of partners to improve the effectiveness of these antibiotic treatments and enhance their reliability so that they do not cause antibiotic killing of fish," said a spokesman.

Read more via "['Thermolicer' Back-Fires Killing 95,400 Farmed Salmon](#)"; [Fish farm firm kills 175,000 salmon by accident](#); "[Oops: fish farm firm kills 175,000 of its salmon by accident](#)" and "[Thousands of fish poached alive in lice treatment bungle](#)"

A Thermolicer treatment caused the deaths of 5,794 salmon at Grieg Seafood Shetland's North Havra site in November 2016:

THE PRESS AND JOURNAL
Tuesday, January 11, 2017

Thermal treatment for lice blamed for salmon deaths

Fish farming: New 'Thermolicer' method under spotlight as 6,000 fish die

by KEITH FINDLAY

yesterday, adding: "This is the second known lethal incident in Scotland after only six months of operation, with other mass mortalities reported in Norway."

Grieg Seafood managing director Grant Cumming said: "Grieg Seafood Shetland is using many alternative methods of treating lice. "We use these low and alternative treatments as part of our integrated pest management strategy in order to reduce the reliance on traditional medicines. "This is important to minimise our impact on the environment and to maintain the working life of the medicines by guarding against resistance, while at the same time ensuring our salmon have a good quality of life free from sea lice infection. "The salmon at North Havra were treated using a Thermolicer hot water treatment. Unfortunately we had some unexpected mortality during the procedure."

Mr Cumming added: "We have investigated the matter behind the event and have altered our procedure to minimise the risk of it reoccurring."

The Thermolicer works by gently reworking and pumping fish through the machine, where they are exposed to an elevated temperature of a maximum of 34C for 25 to 30 seconds. Because sea lice have a low tolerance to temperature change, the warmer water kills them.

Responding to national media reports of thousands of fish being 'poached alive' at one of its Scottish fish farms last year, industry giant Marine Harvest said the stories were a "gross exaggeration and completely misleading". It added: "The Thermolicer has been rigorously tested over a nine-year period and is recommended by the Norwegian Veterinary Institute. The machine has safely treated hundreds of thousands of tonnes of salmon in Norway and Scotland. "It is extremely regrettable we lost fish at Greibornish which we believe was the result of treating fish that had been weakened from other treatments, particularly for amoebic gill disease, in the preceding two months. "The Greibornish experience has understandably raised much internal and external discussion. In particular, it highlights the fine line in judgement required on how and when we treat our fish stocks. We aim to prevent this happening again by raising awareness with staff and increased training."

"We had some unexpected mortality during the procedure"

eradicating any sea lice, the process killed 5,794 fish and led to Grieg launching an investigation into the "unexpected mortality".

According to salmon farming arch-heretic Don Stansfield, the Thermolicer system - developed in Norway - is behind tens of thousands of deaths on fish farms around Scotland. "The Thermolicer sucks and kills," Mr Stansfield said

SOMETHING FISHY: Reports of salmon being 'poached alive' are a 'gross exaggeration' say Marine Harvest



Read more via "[Thermal treatment for lice blamed for salmon deaths](#)" and "[Treatment leads to morts in Shetland](#)"

[3] A [research project by the Norwegian Food Safety Authority \(Mattilsynet\)](#) is investigating the use of the Thermolicer in Norwegian salmon farming:

Forsøksdyr: Effekt av avlusingstemperatur på velferd til laks

Godkjenningsdato 25.11.2016

Skriv ut

Del denne siden

Prosjektbeskrivelse:

Undersøkelsene sikter på å utrede om selve varmebehandlingen som laksen opplever i en thermolicer er i overensstemmelse med gjeldende reglement for dyrevelferd hos oppdrettsfisk. Bruk av thermolicer har vist en del varierende resultater mht velferd/overlevelse. Noe av denne variasjonen kan skyldes tid på året, og en annen faktor kan være sykdomshistorie. I thermoliceren utsettes laksen for både temperatursjokk og mekanisk belastning. I denne utredningen ønsker vi å fokusere på, og isolere effekten av temperaturøkningen. Verdien som temperatur og eksponeringstid legges nært inn til det som i dag brukes i avlusing. Fisken vil bli holdt levende etter behandlingen for å se på langtidseffekter på blodparametre og hud/gjeller

The Fish Site reported in May 2018 via ['Study questions fish welfare in thermal delousing'](#):

Immersing farmed salmon in warmed water as a means of removing sea lice presents serious fish health and welfare issues according to a new study.



The authors of the study, which was led by researchers at [Pharmaq Analytiq](#), suggested that "a better regulatory framework for mechanical treatment of fish in general" is needed and "the present use and technical solutions for thermal de-lousing are inadequate and likely to cause pain and serious lesions in treated fish."

Mechanical treatments that use warm water to remove lice, such as Thermolicers, have been widely adopted by the salmon farming industry – in particularly in Norway and Scotland – and have been shown to remove over 95 percent of the parasites. They have been increasingly popular at a time when a number of therapeutants against sea lice are losing their efficacy, or their use is being limited by regulations.

However, as the researchers note, high mortality and serious lesions associated with thermal sea lice treatments are of concern in the aquaculture industry. Lesions most commonly observed include gill haemorrhage, scale and skin loss, haemorrhage and vacuolation of thymic tissue, degeneration of nasal epithelium and brain haemorrhage.

The [new paper](#) – which was published in the *Norsk veterinærtidsskrift* journal – does, the authors argue, demonstrate "beyond doubt that fish can feel pain and that the temperatures used during thermal de-lousing (28–34 °C) are most likely painful to the fish. This pain will also initiate panic reactions where fish are likely to inflict serious self-damage."



Cooke Aquaculture has recently acquired a Thermolicer for its operations on the east coast of Canada

Here's the [English summary of the paper referred to above](#):

ENGLISH SUMMARY

High mortality and serious lesions associated with thermal sea-lice treatments are of concern in the aquaculture industry. Lesions most commonly observed include gill haemorrhage, scale and skin loss, haemorrhage and vacuolation of thymic tissue, degeneration of nasal epithelium and brain haemorrhage. It is demonstrated beyond doubt that fish can feel pain

and that the temperatures used during thermal de-lousing (28-34 °C) are most likely painful to the fish. This pain will also initiate panic reactions where fish are likely to inflict serious self-damage.

The present documentation of thermal sea-lice treatment on welfare is in the opinion of the authors based on a weak scientific basis and not calibrated for the use in field situations. Furthermore, a better regulatory framework for mechanical treatment

of fish in general is called upon. It is concluded that the present use and technical solutions for thermal de-lousing are inadequate and likely to cause pain and serious lesions in treated fish.

In January 2018, a [Norwegian veterinarian also warned](#):

fishfarmingexpert

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Vet warns of head injury risk to fish during delousing

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Fish vet Kristin Ottesen warned that whatever mechanical delousing method is used, it kills some fish. Photo: Linn Therese Skår Hosteland.

A fish vet has highlighted major head injuries she has seen to fish treated with warm water delousing machinery.

By Linn Therese Skår Hosteland

Kristin Ottesen, of Norwegian firm HaVet, addressed lice treatment with warm water and the Thermolicer or Optilicer, during the Fisheries and Aquaculture Industry Research Fund (FHF) conference "Prevention and Control of Lice" in Trondheim.

"No matter what non-drug method you use for delousing, it kills. Same if it's Skamik, FLS, Thermolicer and Optilice. Both the method and the logistics," Ottesen began.

She noted that temperatures of 30-34 degrees that are lukewarm for humans can be searing for farmed salmon.

'Hear the fish panic'

"But we do not know. When you stand with these machines you can still hear that something happens. One can hear that the fish panic. So the thoughts around this are not from out of the blue," she said.

She says they often see apparently healthy fish that just die after treatment, without finding the fish.

"But is it [the fish] fine? Are we looking for the right things when we look at the fish afterwards?" she asked, adding that surviving fish are not necessarily OK.

"Especially 12 to 24 hours after treatment. You will begin to see 'spare tyres' around the eyes and fluid collections in the palate after warm water treatment. This seeps in gradually. Fish farmers often say they see unconscious and lethargic fish."

Bleeding around the brain

Ottesen said that after opening such fish, she saw large bleeding around the brain and the palate of some of the fish.

"Classically, we are coming to a farm that says they have had some mortality, but are satisfied."

What farmers classify as satisfactory mortality, she adds, ranges from maybe 0.2% to 3%.

"A few weeks later we come to the same farm and see that the fish are falling and there are some sick fish. They look wrong, the eyes of the fish look strange."

Also, on fish that look fine two weeks after treatment, she finds major bleeding in the head region.

Stress-induced damage

"The fish health service has tried to document the trends in this, and the analysis companies they work with conclude that there have been major acute injuries in the head region, which can't be explained by anything other than the lice treatment.

"I see a lot of stress-induced damage to the fish after these treatments in addition to handling. I think we should think about how to build these machines. Is warm water treatment safe? It's something we must ask ourselves."

She says that as a fish health worker she has also fought a hard battle to know what the farmers treat the fish in, besides that it is hot water.

Read in full via "[Vet warns of head injury risk to fish during delousing](#)"

Scottish Salmon Watch concurs with the [statement](#) by Philip Lymbery, Chief Executive of Compassion in World Farming, in November 2016:



Factory farming

Farm animals

Take action

Donate

Our mission is to end factory farming

Philip Lymbery, Compassion CEO

ABOUT PHILIP

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BLOG

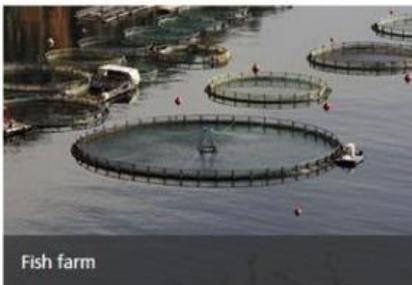
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SCOTTISH INTENSIVE SALMON FARMING PLUMBS NEW DEPTHS



Fish farm

Reports that Scottish salmon farms have killed tens of thousands of fish accidentally by overheating them have sent shockwaves through an industry already under fire for shooting seals.

Seals are all too often shot as part of 'predator control' around intensive fish farms that are effectively factory farms in the sea.

Now nearly a hundred thousand salmon are reported to have been killed after the use of a new device, the 'thermolicer'. The device was used in the latest desperate bid to rid intensively farmed fish from lice, a parasite infestation which is inevitable when so many fish are crammed in a confined space.

Welcome

Compassion in World Farming campaigns to end factory farming. My book, Farmageddon, explodes the myths behind our broken food system and sets out an alternative vision that will benefit animals, people and the countryside.

Philip Lymbery

Information from the Scottish Government, received following a **Freedom of Information request**  by the Global Alliance Against Industrial Aquaculture (GAAIA), reveals that 95,000 fish died on a single Scottish fish farm following the use of a thermolicer.

The thermolicer procedure involves crowding the fish used to the cold coastal waters of Scotland, pumping them into heated water and then dumping them back into their seawater cages. Salmon would never normally experience such sudden temperature changes. Little wonder that so many seem to have died as a result.

Killing fish by overheating, whether accidental or not, is simply inhumane.

The use of rough handling and heat treatment to tackle problems of sea lice is unacceptable on welfare grounds.

Moreover:

Here's Compassion in World Farming's scientific assessment of the Thermolicer prepared by Phil Brooke (Scientific Manager - research and education):

Thermolicer:

Scientific Assessment by Compassion in World Farming (6 November 2016)

The Thermolicer appears to be a brutal treatment which has not been subjected to a full and proper welfare assessment. It involves a series of steps which are inherently stressful and will cause poor welfare to the fish.

1. The salmon are crowded in a net
2. They are pumped in water through a tube into a boat with the Thermolicer on board
3. They are taken out of water – the dewaterer is a metal grid which lets the water through. They bounce along a metal grid into the treatment water
4. They then pass into seawater heated to 30-34 degrees centigrade. Salmon would never normally experience sudden temperature changes like this
5. Finally, they are pumped back into their seawater cage

Improved design and management could reduce this stress but cannot be expected to eliminate it.

Background information

We have seen one report from the Norwegian Veterinary Institute ("[Thermal de-licing of salmonid fish - documentation of fish welfare and effect](#)") which documented statistically significant increases in:

- snout injury following treatment. It is suggested that this should be caused by the effects of crowding the fish before pumping onto the Thermolicer vessel
- fin damage
- scale damage following treatment on one of the sites
- cataracts on one site 3 weeks after treatment

[4] A [statement by Marine Harvest in November 2016](#) included:



We wish to clarify the position in response to a recent article "Poached alive – fish die as farm overheats water" which appeared in The Telegraph (19th November) and subsequently in the Mail on Line.

The Telegraph article was based on a story in The Sunday Herald the week before based on a Freedom of Information enquiry made by them.

Our fish were most definitely not poached alive or boiled alive as these stories state. This is gross exaggeration and completely misleading.

Attached is a background note on how the Thermolicer operates which explains fish are only ever exposed to an elevated temperature of a maximum of 34⁰C for 25 to 30 seconds.

BACKGROUND TO THE THERMOLICER

The Thermolicer is a machine for commercial scale dip or bath treatment to remove sea lice from farmed salmon.

Salmon are gently crowded and pumped into the machine where they pass through the processing loop in 25–30 seconds from where they can then be returned to the same pen or an empty pen. The treatment water has a temperature of 30–34⁰ C, depending on the ambient sea temperature, and because sea lice have a low tolerance to temperature change the higher water temperature will kill the lice. The treatment water is then filtered, aerated, oxygenated and reused in the system.

Read in full via "[Clarification on Salmon Mortality](#)"