

## **Policy on Integrated Pest Management (IPM) for sea lice control**

Integrated Pest Management (IPM) involves a comprehensive and systematic approach to pest management and is considered highly important for effective sea lice management. IPM for sea lice is based upon proven techniques and approaches to terrestrial pest/parasite management for agriculture systems. It accounts for multiple objectives in managing the situation, considers available preventive and intervention options and makes informed decisions aimed at achieving optimal results.

Mowi recognizes the importance of IPM to mitigate lice infection pressure, resistance development and medicine use, and optimise lice control in our operations. The following key elements are identified as part of Mowi's IPM approach:

### **Lice levels and monitoring**

- Adhere to National limits on sea lice levels and other required actions
- Keep lice pressure as low as possible throughout the production cycle
- Lice counting and reporting by trained staff, at a minimum frequency as defined by local regulations
- Weekly and precise counting, and reporting, of sea lice levels on all seawater sites (see Appendix I for average sea lice levels per fish across our farming operations and respective regulatory limits)
- Monitor lice development on all seawater sites

### **Husbandry and management**

- Fallow between production cycles/stocking
- Health management / veterinary health plan in operation
- Maintain clean nets to increase water flow
- Routine removal of moribund fish
- Monitor fish health status, behaviour and disease

### **Prevention**

- Use cleanerfish where experiences are good and cleanerfish is an available preventive tool<sup>1</sup>
- Re-stock with additional cleanerfish as and when required
- Integrate preventive tools (skirts, deep-feeding, deep-lights etc), or a combination of these, where conditions permit and such tools are available
- Apply functional feeds with proven effect
- Coordinate lice management plans within the Area Bay Management (ABM)

### **Intervention**

- Only use licensed medicines, prescribed by a veterinarian/fish health professional, and according to clinical needs
- Minimise internal infection pressure, and handling, by treating on pen level (single pen treatment strategy) when appropriate and possible
- Use the appropriate intervention tools for the lice stages being targeted
- Ensure sufficient capacity on intervention tools
- For each production cycle, and where available, evaluate and use non-medicinal treatment tools
- Practice intervention rotation, where possible and permitted
- Maintain treatment records and monitor treatment efficacy
- Coordinate treatments within the ABM, where possible
- Have knowledge of the resistance status in the ABM

## Reporting

- Sea lice levels in our operations are reported routinely through several public channels. Links to publicly available sea lice data are provided below.
- Through our annual report, we disclose the % sites above national trigger levels<sup>2</sup>, the proportion of fish treated with non-medicinal systems and the quantity of sea lice medicines (oral, topical and hydrogen peroxide) used in our operations (as g active ingredient/t produced).

## Research & Development

- Mowi will continuously develop better management practices, new solutions and sharing best management practices between our operations.
- Together with our academic and commercial partners, and relevant suppliers, we work continuously to optimize existing solutions, develop novel and cost-effective methods for more gentle control of lice and improve the efficiency and welfare of cleanerfish.

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<sup>1</sup> Mowi's expenditure on cleanerfish R&D in 2022 was €169 700 (budget 2023 = €154 200). Main goals of our research are to secure good welfare, survival and effect of the cleanerfish. To reach these goals we work on areas of feed development, vaccines, production optimisation and developing best practices. In addition, Mowi's spend on hides in 2022 was €1 424 500. When using hides, we actively re-position them to maximise cleanerfish effect and ensure they are placed relative to the salmon biomass in the pens, thereby also providing enrichment for salmon.

<sup>2</sup> The % of sites above national trigger levels is registered on a monthly basis for each of our farming operations and the average calculated on an annual basis. This does not mean that a site above the limit will continue to be above the limit. On the contrary, if a site is registered above the limit, then action is taken to bring the site below the limit. Meaning, all sites registered above the limit should be treated to, again, be below the limit. For Canada West, Ireland and Chile, any sites above the limit should be brought below the limit within the regulatory defined timeframe (these timeframes are now factored into our calculations). In Scotland, Ireland, Faroes, Canada and Chile, regulatory sea limits are limits for action to be taken ie. to treat. In Norway, the regulatory limits are absolute, and if exceeded a period of 3 weeks is granted to again get below the limit.

**Links****Norway**

<https://www.barentswatch.no/fiskehelse/>

**Scotland**

<https://sepaweb.maps.arcgis.com/apps/webappviewer/index.html?id=f1527f9cf8cc43acad27dee61d8597de>

**Faroes**

[https://www.hfs.fo/webcenter/portal/HFS/pages\\_aling/hagtl/lsatl](https://www.hfs.fo/webcenter/portal/HFS/pages_aling/hagtl/lsatl)

**Ireland**

<https://www.marine.ie/Home/site-area/areas-activity/aquaculture/sea-lice>

**Canada**

<https://mowi.com/caw/sustainability/sea-lice-reporting/>

<https://open.canada.ca/data/en/dataset/3cafbe89-c98b-4b44-88f1-594e8d28838d>

**Appendix I**

**Average sea lice levels (adult females) per fish across our farming operations, 2018-2022**

<b>BUSINESS UNIT</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
NORWAY	0.14	0.16	0.15	0.12	0.15
SCOTLAND	0.5	0.7	0.9	1.0	0.7
IRELAND	0.5	0.6	0.5	0.1	0.2
FAROEES	0.2	0.6	0.6	0.4	0.3
CANADA*	0.4	0.8	1.1	0.9	1.3
CHILE**	1.6	1.7	2.1	1.2	1.6

\* Canada West only

\*\* *Caligus* spp.

**Lice limits per country**

**Norway**

0.5 adult females fish<sup>-1</sup> and 0.2 adult females fish<sup>-1</sup> during spring period (05 March – 16 April, Norway West; 26 March – 01 May, Norway Mid; 26 April – 01 June, Norway North)

Species: *Lepeophtheirus salmonis*

**Scotland**

2 adult females fish<sup>-1</sup> (reporting) and 6 adult females fish<sup>-1</sup> (intervention), all year round

Species: *Lepeophtheirus salmonis*

**Ireland**

0.3-0.5 ovigerous adult females fish<sup>-1</sup> Mar-May, and 2 ovigerous adult females fish<sup>-1</sup> Jun-Feb

Species: *Lepeophtheirus salmonis*

**Faroese**

0.5 adult females fish<sup>-1</sup> May-July, and 1.0 adult females fish<sup>-1</sup> Aug-Apr

Species: *Lepeophtheirus salmonis*

**Canada**

3 motile lice fish<sup>-1</sup> (preadults+adults) from 01 Mar-30 June

Species: *Lepeophtheirus salmonis*

**Chile**

3 ovigerous females fish<sup>-1</sup> all year round

Species: *Caligus rogercresseyi*