



## **Policy on Integrated Pest Management (IPM) for control of pathogens, including parasites, bacteria and virus, in Kaldvík's sea operations**

Integrated Pest Management (IPM) involves a comprehensive and systematic approach to pest management and is considered highly important for effective pathogen management. IPM for pathogens is based upon general 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.

Kaldvík recognizes the importance of IPM to maintain the low levels of lice on the East coast of Iceland, to maintain our fish free of ISAV, and to reduce the impact of other pathogens that may compromise fish welfare. The following key elements are identified as part of Kaldvík's IPM approach:

### **Fish health, welfare and infection status**

- Monthly fish health monitoring at all sites by third party fish health service/veterinarian
- Registration of all mortalities daily (when conditions allow) and categorization of causes of death in accordance with industry standard.
- Monitor ISAV-infection status by PCR-surveillance of all sites routinely.
- Adhere to National limits on sea lice levels and other required actions.
- Monitor lice infection pressure and initiate actions to maintain a low lice infection pressure throughout the production cycle.
- Due to the very low lice count in the East Fjords of Iceland in the past, the Icelandic government (MAST) has granted Kaldvik with an exemption from the statutory routine lice counting. Kaldvik has installed specialized cameras in each production facility, that monitor lice counts continuously, among other things.

### **Husbandry and management**

- Fallowing of Production areas according to the production- and biosecurity plan of each fjord.
- Veterinary health plan in operation, reviewed and updated yearly.
- Maintain optimal oxygen levels in the net pens to optimize fish welfare. Necessary actions will be implemented when considered appropriate, including net cleaning, use of water transportation systems or other relevant measures.
- Maintain optimal feeding.
- Routine removal of moribund fish.
- Monitor fish health status, behavior and disease.

### **Prevention**

- Ensure optimal smolt quality, including vaccination, proper smoltification and smooth handling during transport.
- Sea sites are distributed in Production areas (fjords) with separate land bases, personnel and equipment, and there are strict biosecurity routines between production areas.

- Fallowing of sites within a production area between each production cycle (minimum 3 months).
- Prevent stress and avoid compromising fish welfare by integrating relevant tools when considered necessary (bird nets, under water-feeding, turbolift, etc), or a combination of these, where conditions permit, and such tools are available.
- Apply functional feeds with proven effect.

### Intervention

- Only use licensed medicines, prescribed by a veterinarian, and according to clinical needs.
- Minimize internal infection pressure, and handling, by initiating actions on pen level (single pen management strategy) when appropriate and possible.
- Use the appropriate intervention tools for the fish health issue being targeted.
- For each production cycle, and where available, evaluate and use non-medicinal treatment methods.
- Practice intervention rotation, where possible and permitted.
- Maintain treatment and mitigation records and monitor treatment and mitigation efficacy.
- Given the very low sea lice number in the east, resistance testing has not been conducted in recent years. However, monitoring the resistance status important. To facilitate this, the site external veterinarians will carry fixative with them to fixate and analyze sea lice that might be present on the fish during a health visit.
- Initiate early harvest when fish welfare situation requires it, and alternative tools are considered insufficient.

### Reporting

- Biomass, environmental data, and mortality in our operations are reported routinely through several public channels. Sea lice levels registered from the Aquabyte cameras are handed over to MAST once a year, in relation to the exemption from routine statutory lice counting.

### Research & Development

- Kaldvík will continuously develop better management practices, new solutions and utilize the best management practices throughout our operations.
- Together with our academic and commercial partners, and relevant suppliers, we work continuously to identify measures, optimize existing solutions, and develop novel and cost-effective methods to optimize fish health and welfare for our operations.

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