Baltic Marine Environment Protection Commission

HELCOM Fish Correspondence Group concerning a draft document on BAT/BEP descriptions for sustainable aquaculture in the Baltic Sea region (CG Aquaculture)

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Document title	A first proposal for BAT/BEP to avoid or minimize hazardous substances pollution from aquaculture operations in the Baltic Sea region
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Submitted by	Germany

Background

In 2016 the HELCOM Contracting Parties adopted Recommendation 37/3 on "Sustainable Aquaculture in the Baltic Sea Region". It recommends to develop BAT and BEP measures aiming at sustainable aquaculture in the Baltic Sea region based on guidance as contained in Annex 1 of Recommendation 37/3. The HELCOM HOD 54-2018 (Outcome § 4.57) requested the Contracting Parties to contribute to the work on BAT/BEP for sustainable aquaculture.

After the CG Aquaculture 2 meeting Germany commissioned work on developing BAT/BEP with respect to pollution by nutrients and hazardous substances for sustainable aquaculture operations in the Baltic Sea region. The work was carried out by the AquaBioTech Group in cooperation with EUCC (Küsten Union Deutschland e.V.) and a final report was delivered in June 2020 (see document 6-1 of CG Aquaculture 3).

At CG Aquaculture 3 Germany offered to take the lead on the topic of hazardous substances. Unfortunately, no other Contracting Parties were found to take the co-lead.

The Contracting Parties and Observers were invited to submit written comments related to the topic of hazardous substances, making use of the information contained in document 6-1 after CG Aquaculture 3. No comments were received.

Based on the report of the AquaBioTech Group, a first proposal for BAT/BEP to avoid or minimize pollution by hazardous substances from aquaculture operations in the Baltic Sea region was prepared. This proposal should constitute the basis for developing BAT/BEP under HELCOM Recommendation 37/3 with respect to hazardous substances.

Action requested

The Meeting is invited to

- discuss the first proposal for BAT/BEP to avoid or minimize inputs of hazardous substances; and
- decide on further steps to be undertaken to further advance the work.

A first proposal for BAT/BEP to avoid or minimize hazardous substances pollution from aquaculture operations in the Baltic Sea region

Aquaculture operations can be a source of hazardous substances inputs. Veterinary medicinal products, antifouling coatings, and cleaning and disinfection products can contain hazardous substances which can make their way to the marine environment. Especially toxic, bioaccumulative, and persistent substances as well as endocrine disruptive substances are of concern. BAT/BEP therefore should aim to avoid pollution from hazardous substances.

1 Veterinary medicinal products

The BAT/BEP for the use of veterinary medicines in aquaculture is always to utilise preventative methods first. In the case of culturing, fish stock treatment can cause stress which can lead to mortalities. Therapeutants should therefore only be used as a last resort. Best preventative methods depend on the species being cultured and the production system being used.

1.1 Preventive health management

- Apply good management practices to reduce the stress experienced by fish, and therefore their susceptibility to infections.
    - Ensure water quality control parameters such as dissolved oxygen, salinity, temperature, and pH are maintained
    - Stock only healthy fish at correct densities (varies by species and size) in the first instance reducing the likelihood of infections.
    - Welfare and hygiene procedures should be carried out to minimise the risk of infection, such as regular net washing and drying, removing mortalities, and ensuring food is stored correctly and disposed of if it gets contaminated or becomes mouldy or stale.
- Careful planning and permitting of new farms should be done in order to reduce the need for veterinary medicines. Site selection criteria should include water flow/exchange, distance from other farms, and encourage production methods that allow for adequate fallow periods between growth cycles, and careful planning of growth cycle timing (seasonal/temperature dependent), ensuring that the site has adequate water quality to sustain healthy fish production and installing predator deterrents to help reduce stress to the fish.
- If available, use vaccination against relevant diseases to improve fish specific immunity. Vaccinations are an extremely effective preventative measure utilised in aquaculture. Vaccines contribute to the success of salmon production and the use of vaccines results in a decline in antibiotic use. In the Baltic region, vaccines are available for fin fish such as salmon and trout.
- Another alternative and preventative therapy are immunostimulants added to fish feeds. Immunostimulants work by stimulating the immunological response of fin fish species, therefore increasing their resistance against pathogen diseases.

1.2 Treatments

- Only use medicines as they are prescribed, in the correct dosage and application method.
- Regularly train staff to ensure that medicines are administered, and the treatment is recorded correctly.
- For health problems that arise seasonally, a treatment strategy should be developed, and regional co-ordination can also take place.
- Alternative treatments such as cleaner fish for the control of external parasites can also be explored, reducing the need for medicinal treatment. Cleaner fish such as lump sucker fish are produced in large scale aquaculture systems specifically for this use.
- Unused or expired veterinary medicines should be disposed of properly to avoid contamination of fresh water and marine ecosystems. Standards for disposal methods should be in place and enforced. A simple waste disposal method for veterinary medicines is 'take-back' schemes, where unused pharmaceuticals are returned to the pharmacy. Some countries have waste collection points for medicines.
- Integrated management in areas where aquaculture is taking place could prove effective especially in the case of contagious infections and external parasites. If neighbouring farms communicate any issues and co-ordinate their treatments it could also reduce the number of treatments required to treat fish, which reduces the stress for the fish and the loading of medicines into the environment.
- Bath treatments are associated with the direct discharged of therapeutants into the surrounding environment. As such, alternative methods of administration should be given priority. Dip-treatments can be used with a much reduced, or even eliminated discharge of therapeutants, when treatment water is disposed of properly.
- Considerations should be made for land-based aquaculture to allocate allowed discharge concentrations, durations, and frequency, managed by catchment area.

1.3 Regulation

- The use of Veterinary medicinal products (VMPs) should be in line with the relevant EU and national regulation. Regulation pertaining to VMP environmental impact assessments is expected to progressively develop and refine. Although not currently required by EU legislation, a strategy for implementing VMP modelling within a framework for monitoring environmental impacts should be considered. Models are available for predicting the dispersion and the concentration in sediments and water of VMPS. However, these must be calibrated for the relevant environments of the Baltic Sea region and the VMPs being used. Some models may be unsuitable and new models may be needed. In particular, models for predicting the end-fate ecological effects of VMPs require development.
- Treatment frequency and spatial impacts should be regulated. This means maximum allowable concentrations should be set for different time spans following treatment and for multiple distances on the seabed from the farms.
- Regular monitoring and audits of record keeping, and medicine storage should be carried out to ensure compliance and good practice. As part of these audits, data collation about treatment frequency, treatment type, dosage, and treatment dates and duration can be carried out by the regulator. Aquaculture producers should collect this information and can submit it to regulators on a regular basis.

2 Antifouling

To reduce environmental impacts, biocide free antifouling strategies should be implemented. Biocidal antifouling strategies must be considered only when needed due to a significant fouling pressure, regions of the Baltic Sea with low levels of salinity might not need antifouling coatings. National or regional regulation have to be considered and followed.

2.1 Biocide free antifouling strategies

- Management of antifouling should be coordinated by experienced staff. Knowledge of biofouling season, in addition to monitoring of plankton and spat-fall, enables appropriate net changing and infrastructure cleaning regimes. The most important factor in managing biofouling is the possibility to accurately predict the incidence of fouling episodes, such as mussel spat-fall.
- Cleaning of nets and other infrastructures should be done on land. On land net cleaning sites must have suitable effluent treatment systems in place. Biological waste must be stored and/or disposed of appropriately.
- The colour of netting should be selected depending on the local conditions and presence of fouling species.
- Mussels should be cleaned as part of post-harvest processing or the use of biological control should be explored.

2.2 Biocidal antifouling strategies

- Only approved antifouling agents should be used. Cage farms using biocidal antifoulants have to obtain all necessary authorizations for their use. Land-based farms shall obtain any required discharge permits from government agencies.
- Use of antifouling agents should follow suppliers' instructions to avoid bioaccumulation in fish and aquatic organisms.
- Nettings made of novel materials requiring less or no antifouling treatment should be preferred, but only if they offer effective treatment and demonstrably reduced environmental impacts.
- Emerging antifouling strategies should be preferred when relevant. Copper free or antifouling treatment with lower concentrations (<7%) of di-copper oxide should be preferred (in accordance with the suggestion for the update of the HELCOM Recommendation on anti-fouling systems).
- In situ mechanical cleaning of biocidal coatings should be avoided, to prevent contamination of marine sediments. Blasting technologies are not recommended on biocidal coatings. When in situ cleaning is necessary, methods (using vacuum system) must be applied to ensure retention of the materials.
- Nets coated with biocidal antifouling products should be stored and disposed of properly to avoid environmental contamination.
- Where copper (treated) nets are used, monitoring of copper levels outside the Allowable Zone of Effect (AZE) must be undertaken and concentrations should not exceed agreed limits (in accordance with the suggestion for the update of the HELCOM Recommendation on anti-fouling systems / the HELCOM copper indicator under development).

3 Cleaning and disinfection agents

To reduce environmental impact BAT/BEP should be implemented during storage, use and disposal of agents.

3.1 Storage

- Containers must be properly labelled with expiry date, instruction and risk indicators should be used (explosive, toxic etc.).
- Cleaning and disinfection agents should be stored in a safe and responsible manner in a dry, well-ventilated, and lockable store to prevent direct or indirect danger to the environment.
- The store area should be clearly marked.

3.2 Use of agents

- Only products that are legally registered for the intended application should be used.
- Cleaning and disinfectant agents should only be used when necessary. Volumes used should be reduces as much as possible.
- Use the most appropriate type of product for the situation.
- Products with less environmentally hazardous properties should be chosen (eco-label if applicable):
    - For cleaning, use biodegradable soaps
    - Disinfectants that have no or minimal impact on the environment, such as products containing chlorine products, hydrogen peroxide or peracetic acid should be used.
- Appropriate application method and dosage, amount or concentration as specified on the label should be used.
- When using commercial biocides, aquatic test strips which are mostly available should be used to determine the concentrations within a given solution.
- Potential residues of cleaning and disinfectant agents on surfaces should be avoided. Surfaces should be rinsed and dried after cleaning and disinfection.

3.3 Spills

- Precautions should be taken to prevent spills. Procedures and containment plans should be in place for managing spills of cleaning and disinfection agents. Supplies needed for cleaning up spills should be available.

3.4 Disposal

- Soaps or disinfectants should not directly be discharged into the aquatic environment.
- Follow Manufacturers recommendation for disposal of disinfectants should be followed.
- Empty containers should be turned over to a waste management company.

- Disposal of unused chemicals should be done according to applicable national regulations.
- **3.5 Staff training**
- Staff should be trained on the proper use of cleaning and disinfection agents.
- Staff should be trained to manage spills.