# Code of Good Practice

## **Chapter 5:** Seawater Tanks


code of good practice
scottish finfish aquaculture

# CHAPTER 5: SEAWATER TANKS

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## AMENDMENT CONTROL: SEAWATER TANKS

The CoGP will be reviewed and updated, as necessary, to ensure it continues to take account of current developments in technology and best practice.

All companies participating in the Code will be advised of changes as they occur. The version of the Code accessible on www.thecodeofgoodpractice.co.uk is current and includes all material updates to the Seawater Tanks chapter as listed below.

| Amendment date | Section N°/Topic |
|---|---|
| 30 Jan 2015 | 3.5/Mortality notification |
| | 3.70 – 3.81/ Cleaner fish |
| | 3.94 – 3.115/Vaccination |
| | |

# CHAPTER 5: SEAWATER TANKS

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*Many aspects of farming fish in seawater tank sites are regulated under European, UK and Scottish law. The undernoted provisions are additional to legal requirements.*

## 1 DOCUMENTS AND TRAINING

### *Documentation Control*

**1.1** Documents, records and other information relevant to the management of aquaculture operations should be held and controlled effectively.

**1.2** All documents should be the current version and be properly authorised.

**1.3** All documents should be clearly written, contain sufficient detail for the purpose and be readily accessible to the relevant personnel.

**1.4** Reasons for amendments to, and replacement of, documents should be recorded.

**1.5** Other documents should be retained for an appropriate time and be available for inspection.

### *Training*

**1.6** Documented evidence of training of individuals in activities relevant to the farming of fish in seawater tanks should be maintained.

# 2 FOOD SAFETY AND CONSUMER ASSURANCE

### *Use of Licensed and Approved Treatments*

**2.1** Veterinary medicines should be used prudently under the conditions set out in the data sheet and/or as advised by the veterinary surgeon.

**2.2** Details of treatments used should be covered in Written Control Procedures which should describe:

2.2.1 The involvement of the nominated veterinary surgeon;
2.2.2 The justification for the use of treatment;
2.2.3 The nature of the treatment used;
2.2.4 The circumstances under which fish are treated;
2.2.5 Official controls on the use of the treatment including, as appropriate, Controlled Activity Regulations (CAR) licence conditions;
2.2.6 Measures in place to prevent unacceptable residues remaining the edible tissues when fish enter the human food chain.

### *Traceability to Farm and Enclosure of Origin*

**2.3** Farmers should identify the suppliers of eggs, fish, etc. going into their production processes.

**2.4** Traceability should be maintained throughout production processes.

**2.5** Businesses to which products have been supplied should be identified.

**2.6** Traceability records should be maintained and such information made available to the competent authorities on demand.

# 3 FISH HEALTH AND BIOSECURITY

### *Key Principles of Fish Health and Biosecurity Management*

**3.1** Companies should have a Veterinary Health Plan (VHP) and Biosecurity Plan (BP) covering relevant aspects set out in Annex 2.

**3.2** VHPs and BPs should be reviewed at the end of each production cycle.

**3.3** All staff engaged in the production of fish should be familiar with relevant aspects of the VHP and BP.

**3.4** Companies should have written procedures to ensure that production staff notify company management immediately when disease is suspected, where abnormal behaviour is evident, or where morbidity or mortality levels are unusually high or subject to rapid increase.

**3.5** Where the level of fish mortality exceeds the threshold(s) below, agreed by the Fish Health Working Group, this should be notified to Marine Scotland's Fish Health Inspectorate and the veterinary surgeon who has the fish under his/her care.

| ***Site Ave. Weight (g)*** | ***Max. weekly mortality (%)*** | ***Max. 5-week rolling mortality (%)*** |
|---|---|---|
| *Under 750* | *1.5* | *6* |
| *750+* | *1.0* | *4* |

**3.6** Dead fish should be removed from the fish holding enclosure as soon as possible.

**3.7** At all stages, the number of dead fish should be recorded, along with, where possible, a record of the cause of death.

**3.8** Subject to safe operating conditions, in the event of a disease outbreak, dead fish should be removed daily.

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*Good hygiene practice includes within its scope the conduct and hygiene of persons concerned, their personal clothing, personal protective equipment and other equipment used by them on site.*

**3.9** Fish farm personnel and visitors to fish farms should be made aware of the role they play in minimising the risk of disease transmission, following good hygiene practice and procedures.

**3.10** Risk assessments should be conducted by trained personnel experienced in the appropriate methodology (see Annex 3).

**3.11** The outcome of risk assessments should be communicated to the relevant production personnel and other personnel responsible for implementation of the outcomes.

**3.12** Farmers should reduce any risk to fish health associated with the presence of wild birds, mammalian predators and vermin by ensuring the secure storage of feed, good feeding practice and the secure temporary storage of dead fish.

### *Importation of Fish Gametes and Fertilised Eggs*

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*The importation of fish gametes and eggs is the subject of European and UK legislation. The undernoted provisions are additional to legal requirements.*

**3.13** Companies proposing to import eggs from overseas should visit the sites on which the eggs are produced and audit the procedures being followed on these sites to satisfy themselves that good practice is being followed.

**3.14** Proposals to import gametes and fertilised eggs should be underpinned by a documented risk assessment prepared by the importing company (see Annex 3).

**3.15** Importation should only take place if the outcome of the risk assessment is satisfactory (see Annex 3).

**3.16** Eggs should only be imported from certified disease-free sources.

**3.17** In all cases, written evidence should be provided that eggs have been properly disinfected.

**3.18** Water and packaging which has come into contact with imported eggs should be properly disinfected and disposed of by an approved method**.**

### *Importation of Live Marine Fish*

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*The importation of live marine fish is the subject of European and UK legislation. The undernoted provisions are additional to legal requirements.*

**3.19** Companies proposing to import live marine fish from overseas should visit the sites on which the fish are being produced and audit the procedures in operation to satisfy themselves that good practice and appropriate risk management are being followed.

**3.20** Proposals to import live marine fish should be underpinned by documented risk assessments (Annex 3).

**3.21** Importation should only take place if the outcome of the risk assessment is satisfactory.

**3.22** Farmers should obtain, and hold on record, appropriate certification to demonstrate that any live marine fish to be imported are free from pathogens relevant to the species concerned and to other susceptible species.

**3.23** All imported marine finfish should be held in quarantine in a land-based site with appropriate effluent disinfection, where their health should be monitored for a period of no less than 3 months.

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It should be noted that some effluent disinfection measures may require a CAR consent.

**3.24** While imported marine finfish are being held in quarantine, testing for listed, notifiable and other potentially serious diseases should be carried out on all dead fish and any fish showing signs of morbidity.

**3.25** After 3 months, quarantine conditions should only be lifted and fish positively released where test results are negative.

**3.26** All imported marine finfish should be certified as only having been treated with medicines that are licensed in accordance with European legislation.

### *Importation of Live Salmonids*

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*The importation of live salmonids is the subject of European and UK legislation. The undernoted provisions are additional to legal requirements.*

**3.27** Companies proposing to import live salmonids from overseas should visit the sites on which the fish are being produced and audit the procedures in operation to satisfy themselves that good practice and appropriate risk management is being followed.

**3.28** Proposals to import live salmonids should be underpinned by documented risk assessments.

**3.29** A decision to import should only be taken if the outcome of the risk assessment is satisfactory.

**3.30** Risk assessments should take into account the potential to introduce *Gyrodactylus salaris*.

**3.31** Farmers should hold on record appropriate certification to demonstrate that any salmonids to be imported are free from pathogens.

**3.32** Farmers should hold records to demonstrate that salmonids to be imported have been vaccinated, where this is appropriate.

**3.33** Live salmonids imported from approved zones or compartments in countries of lower health status, as defined by the World Organisation for Animal Health (OIE, www.oie.int), including Norway and third countries, should be held in quarantine in secure land-based facilities with appropriate effluent disinfection, for a period of no less than 3 months, during which time their health should be monitored.

**3.34** During the time that such imported salmonids are being held in quarantine, testing for listed, notifiable and other potentially serious diseases should be carried out on all dead fish and any fish showing signs of morbidity.

**3.35** Quarantine conditions should only be lifted and fish positively released where test results are negative.

**3.36** Where fish cannot be positively released, measures to deal with the fish should be in accordance with OIE guidance.

**3.37** Following importation, movements of imported live salmonids should only take place on the basis of a satisfactory outcome from a documented risk assessment (Annex 3).

### *Site Disinfection*

**3.38** Tanks should be cleaned and disinfected when empty, along with associated equipment.

**3.39** Disinfection should be conducted to a level to inactivate pathogens considered to pose significant risk (see Annex 4).

### *Ongrowing in Seawater Tanks*

**3.40** It is recommended that sites contain only one commercial species. An exception to this general recommendation is the cohabiting of salmon with cleaner fish such as wrasse and lumpsuckers.

**3.41** As far as is reasonably practicable in marine FMAs, personnel, equipment and personal protective equipment should be site specific.

**3.42** Helicopter buckets, vehicles and road transport equipment used to transfer fish to marine ongrowing tanks should be disinfected, as required, in accordance with recommended practice (see Annex 4).

**3.43** Documented evidence of disinfection should be obtained from those responsible for transportation.

### *Sea Lice*

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*It is a legal requirement to maintain specific records in relation to sea lice. The record-keeping requirement set out in law is based upon the provisions of this CoGP. Farmers should follow "A National Treatment Strategy for the Control of Sea Lice on Scottish Salmon Farms" (NTS). The standards associated with this are set out below and the strategy is presented in full in Annex 6.*

**3.44** Each company operating within each area should nominate a person to act as the point of contact.

**3.45** Each company operating within each area should provide a written undertaking that their farm(s) will observe the provisions of the NTS.

**3.46** Each company operating within each area should form an area group, including appropriate veterinary involvement, whose role is to a) agree the basis for monitoring lice on farms, based on the guidance set out below; b) agree the basis for treatments carried out in cooperation with participating farms; and c) oversee and coordinate monitoring and treatment.

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*The undernoted sets out a suggested monitoring protocol based on scientific and statistical advice (Sampling Strategies for Estimating Sea Lice Levels on Farmed Atlantic Salmon: Fryer, Revie & Gettinby, personal communication).*

*Each company must count lice numbers on the fish held on its farm(s). NB although originally designed as a requirement of the Code, this is now a legal requirement.*

i) *Pens and fish should be sampled at random.*

*ii)* *Personnel carrying out lice counts should have appropriate training in lice recognition and recording, and demonstrate post-training competence.*

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|---|---|
| *iii)* | *Where there are more than five pens per site, five fish should be sampled from each of five pens to give a total of 25 fish.* |
| *iv)* | *Where a site contains less than five pens all pens should be sampled to give a total of 25 fish. A similar number of fish should be selected from each pen.* |
| *v)* | *Fish should be netted from the cage and put straight into the anaesthetic.* |
| *vi)* | *Each life cycle stage of Lepeophtheirus salmonis should be counted in turn, i.e. adult females, mobiles, chalimus. All identifiable stages of Caligus elongatus should be grouped together.* |
| *vii)* | *After completing the lice counts on the fish from each pen, the tub containing the anaesthetic should be examined for sea lice which may have been shed from the fish and any lice found should be added to the total.* |
| *viii)* | *The name of the person carrying out the counts, the date, the pen number and the water temperature at a depth appropriate to the depth of the pens used on the site should be recorded.* |
| *ix)* | *Minimum recording requirements during sea lice counts are L. salmonis chalimus, mobiles and adult females (with or without egg strings) plus all identifiable stages of C. elongatus grouped together.* |

*Alternative defined and recorded sampling regimes are acceptable provided that they i) produce reproducible estimates of lice numbers on fish held on the farms; and ii) that the results are periodically benchmarked against data gathered using the suggested protocol set out above.*

**3.47** Weekly monitoring results should be communicated to other farmers within the defined area to facilitate coordinated sea lice management.

**3.48** In the event that lice numbers exceed the suggested treatment threshold, this should be communicated to other farmers within the defined area as soon as reasonably possible.

**3.49** All companies within the SSPO should provide sea lice data and other information relevant to the management of sea lice to the SSPO at monthly intervals.

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*In general, treatments should be guided by* ***the build-up of pre-adults*** *as indicated by weekly counts, the objective being* ***to prevent the development of gravid females***.

*Suggested criteria for the treatment of sea lice on individual farm sites are:*

- *An average of 0.5 adult female L. salmonis per fish during the period 1st February to 30th June inclusive.*
- *An average of 1.0 adult female L. salmonis per fish during the period 1st July to 31st January inclusive.*

**3.50** Treatment for episodic *C. elongatus* infestations should be applied, as appropriate, to protect the welfare of farmed salmon.

**3.51** Treatments should be carried out promptly to maximise the effectiveness of the available medicines, promote the minimal use of medicines consistent with the maintenance of high standards of fish welfare and help preserve efficacy.

**3.52** Annual review meetings should be convened by FMA groups to evaluate the performance of the farms within the areas against the foregoing criteria.

**3.53** Personnel responsible for sea lice management should have received appropriate training.

**3.54** Personnel responsible for sea lice management should be able to demonstrate competence in lice identification, lice counting and reporting the results of counts.

**3.55** Personnel responsible for sea lice management should have knowledge of lice population dynamics and the symptoms of lice infestation.

## *Area Management*

*Farm Management Areas, Farm Management Statements and Farm Management Agreements*

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*It is a legal requirement for farmers to be party to a Farm Management Statement or Agreement. The requirement set out in law is based upon the provisions of this CoGP.*

**3.56** Where one fish farming company operates a single site or all of the sites within a defined FMA, or where there is more than one company but no signed documented FMAg, key aspects of the company's operations which may impact on the health of the farmed fish within the area should be documented in an FMS (see below for guidance).

**3.57** Where more than one company operates within a defined FMA each company should provide the other with a copy of its dated and up-to-date FMS.

**3.58** Any significant changes to the FMS should be notified to other companies in the FMA.

**3.59** Where more than one aquaculture company operates within a defined FMA, it is recommended that companies cooperate in the development and implementation of a signed documented FMAg.

**3.60** FMSs and FMAgs should take into account relevant aspects of the undernoted guidance:

*i. Definition of the area to which the document relates including, where appropriate, local hydrodynamic conditions;*

*ii. General aspects of fish health:*

a. *Vaccines and vaccination regimes;*
b. *Dead fish removal and disposal;*
c. *Health status of the FMA inc. any official control(s) in place;*
d. *Health status of fish to be stocked into the FMA;*
e. *Physical condition of fish to be introduced;*
f. *Veterinary input inc. VHPs and BPs;*
g. *Fallowing plans and protocols.*

iii. *Sea lice control strategy:*
a. *Treatment plans inc. synchronisation of treatments;*
b. *Treatment medicines;*
c. *Sensitivity testing;*
d. *Data collection and exchange.*

iv. *Adherence to agreed stocking densities;*
v. *Movement of live fish;*
vi. *Harvesting protocols;*
vii. *Escapes;*
viii. *Exclusion and control of predators;*
ix. *Stock inspection and independent oversight of the operation of the FMAg;*
x. *Information exchange and communication between FMAg partners;*
xi. *Review of the agreement or statement at least every 2 years.*

**3.61** *FMAs may be redefined following agreement by farmers who share the area:* decisions to redefine FMAs should demonstrate, on the basis of documented evidence and experience, that the risks to health within and outwith the area are not materially increased by the proposal.

### *Harvesting Operations*

**3.62** The method used to crowd fish, remove them from tanks and harvest them should be assessed for the risk of escapes and, where appropriate, contingency arrangements put in place to minimise the risk.

**3.63** Bleeding of fish should take place on a facility where the blood water is contained.

**3.64** Blood water and effluent should be contained and disinfected so as to minimise the risk of spread of pathogens.

**3.65** Appropriate containment measures should be in place to prevent the leakage of blood water from bins, etc.

**3.66** Harvest bins should be checked for damage, thoroughly cleaned and disinfected between operations.

**3.67** Equipment used for on-site harvesting should be dedicated to individual sites, or, if moved between sites, should be thoroughly cleaned and disinfected before being moved.

**3.68** At the end of each period of harvesting, all equipment should be thoroughly cleaned and disinfected.

**3.69** All activities involving movement of fish, cleaning and disinfection of bins and equipment should be recorded and the records retained for an appropriate time.

### *Biological Vectors of Fish Disease*

*Fish*

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*Wild fish species may act as vectors for, and carriers of, pathogens and may transmit these to farmed fish which come into contact with them.*

*"Cleaner fish" is a generic term for species of fish that are used as biological controls to remove lice from farmed fish. Examples of cleaner fish include wrasse and lumpsucker.*

**3.70** Where available, hatchery-reared cleaner fish should be used.

**3.71** A declaration should be held on record from companies that fish for wild cleaner fish, or fishermen catching cleaner fish on behalf of a company, that provisions for the following are made:

3.71.1 Use of appropriate baits (specifically not heads, frames and other by-products of finfish aquaculture, brown or velvet crabs);
3.71.2 Use of otter exclusion devices on all fyke nets deployed;
3.71.3 Maximum and minimum sizes for all fish retained;
3.71.4 Record keeping requirements (catch location, fish caught etc.).

**3.72** The intentional introduction of cleaner fish into tanks for the purpose of sea lice control should only be done on the basis of a satisfactory outcome from a documented risk assessment.

**3.73** Where cleaner fish are to be stocked into tanks, the population should be health checked and shown to be free of pathogens likely to be of significance to salmon and the cleaner fish species.

**3.74** Cleaner fish should not be released into the wild at the end of a production cycle, but should be humanely destroyed and disposed of, or may be re-used in accordance with the provisions set out in this Code.

**3.75** Each tank that contains cleaner fish should have adequate provision of hides for the cleaner fish that are stocked.

**3.76** Supplementary feed should be made available for the cleaner fish, as required by lice levels within each tank.

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*Use/Reuse: The single use of cleaner fish is defined as their use alongside a single generation of salmon on an individual site, or with a single generation of salmon on more than one site within a Farm Management Area, providing their use within the FMA is followed by a co-ordinated area fallow. All other uses constitute reuse.*

**3.77** Cleaner fish should be reused no more than once.

**3.78** Cleaner fish should only be reused if they have been health checked and shown to be free of pathogens likely to be of significance to salmon and the cleaner fish species.

**3.79** Cleaner fish should only be reused following the successful outcome from a documented risk assessment agreed by all companies operating in the FMA where reuse will take place.

**3.80** The risk assessment for reuse of cleaner fish should take into account relevant aspects of the following:

- The presence of cleaner fish on farms within the receiving FMA;
- The quarantine period between first and second use;
- The health status of the cleaner fish being reused;
- The health status of the salmon on both the first and second use sites;
- Any movements of salmon on sites during the first and second use;
- The size of the cleaner fish being reused.

**3.81** Each farm using cleaner fish should have appropriately trained staff, taking into consideration husbandry, health and welfare.

### *Birds and mammals*

**3.82** Transmission of infectious agents by birds and mammals should be minimised through:

3.82.1 Measures designed to exclude birds and mammals from areas where farmed fish are held;

3.82.2 Hygienic procedures for handling dead fish;

3.82.3 Feeding practices that minimise wastage.

### *Use of Medicinal Products*

**3.83** Farmers should prepare and implement a VHP and a BP, which set out biosecurity protocols, preventative measures and treatments (including the use of vaccines, measures for the control of sea lice, etc.) (Annex 2).

**3.84** Where therapeutic treatment is required, this should be initiated at the earliest opportunity.

**3.85** Where therapeutic treatment is required, accurate information on the health status of fish, biomass, temperature, etc., should be provided to the attending veterinary surgeon to allow the calculation of correct dose rates, withdrawal periods, etc.

**3.86** The prescribing veterinary surgeon should always be made aware of any other treatments recently or currently being administered and other circumstances likely to affect treatments.

**3.87** When medication is to be applied, clear written instructions on the use of the medicine should be obtained and effectively communicated to the personnel responsible for its application.

**3.88** The recommended course of treatment at the correct dosage should be completed.

**3.89** In circumstances where this is not possible, treatment may be curtailed. Where treatment is terminated early, this should be recorded and further advice sought from the veterinary surgeon.

**3.90** To avoid the possibility of contamination of unmedicated feed with medication, feed bins or hoppers should be emptied and cleaned at the end of a period of medication.

**3.91** The veterinary surgeon or other person supplying the product should also advise on the correct withdrawal period.

*Suspected Adverse Reactions (SARs)*

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*A Suspected Adverse Reaction (SAR) is a harmful and unintended reaction which may be due to exposure to a veterinary medicine administered to an animal at its normal dose. A human SAR may also occur, in this case in a person administering a veterinary medicine (e.g. through self-injection with a vaccine) or a person exposed to a recently treated animal.*

*Companies holding a Marketing Authorisation (MA) for veterinary medicines, including fish medicines, are legally obliged to report suspected adverse reactions within 15 days of receiving a report and at specified periods in the case of non-serious adverse reactions. Further information is available from the Veterinary Medicines Directorate.*

**3.92** Farmers should record any SAR to a medicine, either in fish being treated or in persons involved in the application of a treatment.

**3.93** SAR reports should be directed via the veterinary surgeon, the supplier, or submitted direct to the Veterinary Medicines Directorate (VMD).

*Vaccination*

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*As in most other livestock, vaccines can be used in farmed fish to prevent diseases and reduce the need for medicinal treatments. Vaccination of Scottish salmon is now normal practice and has had a demonstrable effect in maintaining fish health while minimising the use of antibiotics.*

*Good practice in relation to vaccination is described in 'Responsible use of vaccines and vaccination in fish production' produced by The Responsible Use of Medicines in Agriculture Alliance (RUMA) in 2006*

**3.94** Where appropriate, VHPs and BPs should include a vaccination regime to protect fish from diseases which may present a risk to their health.

**3.95** Farmers should develop documented SOPs to be followed when vaccinating populations of fish.

**3.96** SOPs should draw on information supplied by the prescriber and vaccine manufacturer, along with any guidance prepared by third parties.

**3.97** If a vaccination contractor is engaged, SOPs should be mutually agreed and should specify responsibilities of all parties involved.

**3.98** All of those directly involved in handling fish on the day of vaccination, in anaesthesia of fish and in the delivery of vaccines into fish should be appropriately trained and competent.

**3.99** It is recommended that training is carried out to Lantra-approved or similar standard.

**3.100** Feeding should be withdrawn from fish to be vaccinated for an appropriate period, in accordance with Data Sheet recommendations and fish welfare guidance.

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*Vaccines must be used and stored in accordance with the manufacturer's data sheet and/or the advice of the person prescribing the vaccine. Vaccines for use in Scottish salmon are categorised as either POM-V or POM-VPS; however only a veterinarian may prescribe any vaccine for use outwith the conditions of its Marketing Authorisation, which may include use in fish of a specific size or within a temperature range.*

**3.101** In order to ensure that the effectiveness is maximised, significant size variation in the fish to be vaccinated should be kept to a minimum.

**3.102** Fish should therefore be appropriately graded in preparation for vaccination.

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*The temperature of the water in which vaccinated fish are held pre- and post-vaccination will often have an important bearing on the effectiveness of the vaccine and the protection it confers.*

**3.103** The temperature of the water in which fish are held should be recorded in the week leading up to vaccination, and for a period (as indicated by product data sheets) afterwards.

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*Vaccines must be stored at the correct temperature, in accordance with Data Sheet specifications, in an appropriate container and must not be used after the expiry date.*

**3.104** Vaccination equipment should be maintained and used in a hygienic manner.

**3.105** In the immediate lead up to vaccination operations, all machinery, equipment, tables, vaccination kit, PPE and other materials to be used should be checked to ensure that all that is required is available and fit for purpose.

**3.106** Provisions should be made to ensure that automated vaccination equipment is manned at all times whilst in operation.

**3.107** An appropriate regime for monitoring fish welfare during automated vaccination should be included in the relevant SOP.

*Where vaccination equipment is brought on site from elsewhere:*

**3.108** The supplier should provide proof that the equipment has been appropriately disinfected;

**3.109** The equipment should be disinfected before and after use;

**3.110** Disinfection records should be maintained.

**3.111** To verify that vaccines have been applied in an optimal manner, that they have assisted in achieving the required protection against the relevant pathogen(s), and to demonstrate that the health and welfare of the vaccinated fish remains good, fish should be examined at appropriate intervals during the procedure and after vaccination.

**3.112** Any suspicion of adverse effect should be immediately reported to the person who prescribed the vaccine.

**3.113** Booster vaccinations, if required, should be administered in accordance with manufacturers' directions and veterinary advice.

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*Records must be kept of all vaccination procedures conducted on site and must include the following information:*

- *date of vaccination;*
- *identification of the batch(es) of fish vaccinated;*
- *vaccine used (including batch numbers and method of application);*
- *details of dosage.*

*In addition to the legal requirements above*:

**3.114** The method of vaccination (e.g. manual, machine-assisted, fully-automated) should be recorded;

**3.115** The names of the personnel involved should be recorded.

## MANAGING AND PROTECTING THE ENVIRONMENT

### *Fuel Oil Handling and Storage*

**4.1** Contractors and third parties working on the site should have a contract which specifies the requirement to work within the conditions of this CoGP.

### *Redundant Equipment and Waste Materials*

**4.2** All waste materials such as feed bags, etc. should be carefully collected, properly segregated, stored and recycled or disposed of by an approved means within a defined timescale.

### *Noise*

**4.3** Farmers should ensure that equipment that creates significant noise (air blowers, generators, etc.) is suitably muffled in order to prevent unacceptable disturbance to wildlife or humans. *Advice on suitable measures may be obtained from local Environmental Health departments.*

### *Lights*

**4.4** All lighting should be installed and/or shielded in such a way as to direct the light to where it is required.

### *Odours*

**4.5** Farmers should ensure that offensive odours that might arise from farming activities are strictly managed and minimised. *The Environmental Health Department of the Local Authority may be consulted for advice*

### *Containment*

**4.6** New tank sites should be located in areas that are unlikely to be affected by flooding.

**4.7** Tank systems should be designed and operated in such a way as to contain fish effectively, and provide for containment during periods of high water flow.

**4.8** The inflow and outflow from tank systems and discharges from the farm should be screened to prevent the loss of fish in all water flow conditions.

**4.9** Where the outflow from tanks passes into a settling pond, the outflow from the settling pond should incorporate a screen of suitable size and construction to prevent the loss of fish from the farm.

**4.10** Screens should be inspected as often as possible and remedial action taken as required.

**4.11** Records of inspections and any remedial action required should be maintained.

*Fish Handling and Transfer*

**4.12** Procedures which could increase the risk of fish escaping from tanks should be carefully planned and supervised to minimise any risk.

**4.13** A documented risk assessment, a standard operating procedure and a contingency plan should be in place before any such procedure is followed.

*Failure of Containment*

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*Guidance on what to do in the event of an escape is available at the Marine Scotland website.*

**4.14** Farmers should have site-specific contingency plans that describe actions to be taken in the event of any escapes.

**4.15** All farm staff should be aware of factors affecting the potential breaches of containment and trained in actions to take in the event of an escape.

**4.16** Weather permitting, and having regard to health and safety conditions, daily visual inspection of the holding units should be carried out to ensure containment of the stock.

**4.17** Any escape, or suspected escape, of live fish should be reported immediately to all relevant stakeholders, including the relevant Producer Organisation or

industry association, the local District Salmon Fisheries Board and Fisheries Trust (or at the latest, within 48 hours of discovery).

**4.18** A decision to attempt to recapture fish and the method to be employed should be agreed with the local District Salmon Fisheries Board and Fisheries Trust and permission sought from Marine Scotland.

# 5 FISH WELFARE AND CARE

### *Veterinary Health Plan and Biosecurity Plan*

**5.1** In order to ensure that companies operate to the highest possible standards of welfare, all farmers should develop a documented VHP and a BP that are updated regularly.

**5.2** Each farm should have access to a veterinary surgeon experienced in fish health to advise on fish health matters and medicine usage, and who is available to attend at short notice.

### *Fish Farm Locations*

**5.3** The siting of farms should be such that there is an adequate supply of water of suitable quality at all times.

**5.4** Where appropriate, there should be emergency back-up systems to maintain a high standard of water quality.

**5.5** Sites should be located and operated in such a way as to minimise the possibility of adverse environmental conditions having an undesired effect on the fish.

**5.6** Farmers should have written contingency plans covering actions to be taken in the event of a serious incident, such as storm damage or water quality problems. These plans should consider both the welfare of the fish and environmental protection.

### *Design and Planning of Farms, Equipment and Operating Systems*

**5.7** The siting of tanks and enclosures should be considered with a view to optimising fish welfare conditions.

**5.8** Equipment and farm design should protect the fish from predators.

**5.9** The design of shore bases and land-based fish farms should facilitate the control of predators and vermin.

**5.10** Equipment should be designed in such a way as to avoid creating welfare problems for the fish and be capable of being cleaned and disinfected.

**5.11** Farm design should be such that daily inspection of all stock is possible.

**5.12** Farm design should allow the regular removal of moribund or dead fish as specified in the VHP.

**5.13** Farmers should be aware of, and consider the use of, new technology that improves the welfare of fish.

**5.14** Farmers should have access to reliable and relevant information on fish welfare.

**5.15** Contingency plans should be in place in case of failure of the water supply or equipment which is critical to the welfare of the fish.

**5.16** Farms and fish holding units, including inlets and outlets, should be designed in such a way as to minimise fish escapes.

### *Water Supply and Quality*

**5.17** The flow rate of water supplying holding facilities should be such that the fish receive sufficient water of suitable quality (especially in terms of oxygen content) to ensure that their welfare is optimised and that metabolic and other waste products are adequately removed.

**5.18** Monitoring should be carried out to ensure that water quality parameters are maintained within the known acceptable limits for the species. The parameters measured and the monitoring intervals will depend on the system, species, stage of development and time of year.

**5.19** Where water quality parameters are outwith the acceptable range, steps should be taken to identify the cause and put in place remedial action as soon as possible.

**5.20** Where appropriate, automatic equipment fitted with alarms should be used to monitor water quality.

**5.21** Where the welfare of the fish is critically dependent on air/oxygen supply or pumped water, automatic oxygen and water level monitoring equipment should be used.

**5.22** Aeration/oxygenation/water level monitoring equipment should be fitted with alarms and backup systems which are tested daily.

**5.23** Automatic and emergency back up and monitoring equipment should be routinely inspected, calibrated and serviced, in accordance with manufacturer's recommendations.

**5.24** Farmers should be familiar with water quality parameters for their stock and be able to recognise visual and behavioural indicators of inadequate water quality.

### *Light*

**5.25** Levels of light to which fish are exposed should be appropriate to the species and stage of development.

**5.26** Lighting which is optimal for fish welfare should be determined on a site by site basis using practical experience, research and specialist advice.

**5.27** Fish species which are sensitive to high ambient light levels or ultraviolet light should be kept suitably shaded or otherwise protected.

**5.28** Sudden changes in light levels should be avoided wherever possible.

### *Inspection and Testing*

**5.29** Weather permitting, and having regard to health and safety conditions, all equipment should be visually inspected daily.

**5.30** Any defect should be immediately recorded and reported to supervisors.

**5.31** All defects should be immediately rectified and, where this is not possible, alternative measures put in place to safeguard fish welfare.

### *Predator Control*

**5.32** Farmers should have standard operating procedures to prevent and manage predation problems.

**5.33** Farmers should document sightings of predators in the vicinity of farms.

*Birds*

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*Birds may only be killed or taken if a licence has been issued by Scottish Government and the conditions specified in the licence must be followed. The conditions specified in the licence are as follows:*

- *The specified method for killing birds must be followed;*
- *The specified maximum number of birds to be killed must not be exceeded;*
- *Documented records of birds killed must be kept;*
- *When it is permissible by law to shoot a bird, it may only be done by a proficient named person, using an appropriate firearm and ammunition;*

**5.34** Birds should be excluded by deploying permitted measures such as nets, strings, scarecrows and other systems designed for the purpose.

*Otters*

**5.35** Equipment should be deployed in such a manner as to reduce the likelihood of access by otters.

*Mink*

**5.36** Equipment should be deployed in such a manner as to reduce the likelihood of access by mink.

**5.37** Well maintained and secure top nets with a top net mesh of less than 3 inches should be employed in an effort to deter mink.

*Record-keeping*

**5.38** Records of losses to predators and use of predator control systems should be maintained.

### *Stockmanship and Husbandry*

**5.39** Farmers should be able to recognise indicators of reduced welfare in fish, including abnormal behaviour, physical injury and symptoms of disease, and take remedial action in the event that such indicators are apparent.

### *Handling Live or Conscious Fish*

**5.40** Live fish should only be removed from water and handled when absolutely necessary.

**5.41** If fish are handled, adequate support should be given to the body - live fish should never be held by the gills or tail only.

**5.42** Different species have different tolerance to being out of water, but the time out of water should never be so long as to produce signs of distress.

**5.43** Even for tolerant species, e.g. flatfish, the time out of water should be as short as possible when the air temperature is particularly high or low.

**5.44** In all cases, fish should be kept wet, except where blotting dry is essential to avoid contamination of gametes during stripping.

**5.45** Where pumps, pipes and grading equipment are used, these should be properly designed and correctly set up so that they do not injure or unnecessarily stress fish.

*Hand nets*

**5.46** Hand nets should be of suitable proportions – physical size and mesh size.

**5.47** Hand nets should be designed and constructed to minimise physical damage to fish.

**5.48** Hand nets should be kept clean, disinfected and in good repair.

### *Crowding*

**5.49** A written procedure for crowding of fish should be prepared.

**5.50** Personnel should be trained in the appropriate techniques.

**5.51** The frequency and duration of crowding should be kept to the minimum.

**5.52** Farmers should monitor fish behaviour during crowding and take action if fish show signs of stress or damage.

**5.53** Farmers should remove and cull any moribund or damaged fish.

**5.54** Farmers should ensure that enclosure nets and screens are kept clean in order to avoid water quality problems during crowding.

**5.55** Farmers should monitor oxygen levels during crowding and take corrective action if levels fall below a critical point for that species (the critical point will vary between species and with environmental factors).

### *Removal and Disposal of Dead and Moribund Fish*

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> *Disposal of dead fish is the subject of EU, UK and Scottish legislation.*

**5.56** Fish should be inspected daily and dead or moribund fish should be removed, minimising handling to avoid stress to the live fish within the enclosure.

**5.57** Where problems are identified during an inspection, prompt remedial action should be taken in accordance with the VHP and BP to determine the cause and deal with the problem, including where appropriate consultation with a veterinary surgeon or fish health specialist.

**5.58** Records should be kept of each inspection, which include the number of dead fish removed and the likely cause of death, as determined by a competent person.

### *Marking*

**5.59** Marking methods that cause distress or injury to farmed fish should not be used.

### *Withholding Feed*

**5.60** Before transport or harvest, feed should be withheld to reduce metabolic rate and the excretion of waste products, and to eliminate the presence of food and/or faecal material in the gut at harvest, thus minimising the risk of microbiological contamination during processing.

**5.61** The period during which fish are deprived of food to achieve gut clearance prior to certain procedures or harvesting should be appropriate to the species and temperature.

**5.62** Complete withdrawal of food should not be used as a means of conditioning fish prior to harvest.

**5.63** *Feed withdrawal may form part of the response to the onset of adverse environmental conditions and in the treatment of certain diseases (e.g. pancreas disease of Atlantic salmon).* Veterinary advice should be sought on

this with, as appropriate, feed withdrawal protocols being included in the VHP and BP.

### *Stocking Density*

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*As a general rule, stocking density may be adjusted in line with the biological* and *behavioural needs of fish having regard to the prevailing environmental conditions and, in particular, water quality. The farming system in which the fish are held and the ability to maintain high standards of water quality are important defining factors in determining optimum stocking density.*

**5.64** Stocking density should be monitored in relation to fish health, fish behaviour and water quality to ensure that fish welfare is not compromised.

**5.65** Immediate attention should be given to any problems that arise.

### *Grading*

**5.66** The avoidance of injury and stress to fish should be a primary consideration when deciding on the method of grading to be employed.

**5.67** Grading equipment should be designed and maintained so as not to damage the fish.

**5.68** Details of planned frequency and procedures for grading should be part of the VHP and BP.

### *Transport of Live Fish*

**5.69** Crowding of fish before collection for transport should be kept to a minimum.

**5.70** Fish should be transported in such a way that possible adverse effects on their welfare are minimised.

**5.71** Biosecurity and fish welfare should be considered before transporting fish populations.

**5.72** For transport, oxygen monitoring should be carried out with sufficiently frequent monitoring intervals to ensure that oxygen levels remain within safe limits at all times.

**5.73** Control systems for oxygenation of water should be such that adjustments may be made timeously.

**5.74** Supplementary oxygen or air supply should be sufficient to last longer than the anticipated length of the journey, including helicopter transport.

**5.75** Excessive or rapid changes in water temperature or pH in transport tanks should be avoided.

**5.76** Any fish that die during transportation should be separated from live fish as soon as possible after arrival and the cause of death determined by a competent person.

**5.77** Transport water should not be discharged *en route* directly into natural water courses.

### *Harvesting and Culling*

**5.78** Fish should be fasted for the minimum period necessary to clear the gut of feed and faeces.

**5.79** Crowding fish prior to harvesting should be for the minimum time possible, especially where more than one crowding session is necessary to complete the harvest.

**5.80** Killing efficiency should be monitored by a proficient person to ensure fish do not regain consciousness prior to death.

**5.81** Arrangements for emergency culling should be addressed in the VHP and BP.

# 6 FEED AND FEEDING

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> *Fish feed manufacturing is a specialist sector of the feed manufacturing industry. Fish farmers will therefore generally source their feed through specialist commercial suppliers, who must operate within the relevant feed legislation and strict regulatory controls. That situation is therefore reflected in this section of the CoGP.*

### *Feed Formulation*

**6.1** Farmers should ensure, through labelling information or documentary assurance, that they use feeds that have been formulated for the species and life stage of fish being grown.

### *Use of Feed*

**6.2** Farmers should have a written feed management plan, which includes the following points:

6.2.1 Feeding the correct feed size;

6.2.2 Feeding the correct amount of feed to any population of fish, in the proper manner and over the correct period(s) of the day;

6.2.3 Regular monitoring of feed conversion efficiency (following sample weighing), and assessment of whether feeding protocols and guidelines to assist farm personnel are effective.

**6.3** The use of 'feedback loop' feeding systems should be considered, since these improve conversion efficiency, reduce environmental impact, and generally ensure that finfish feed is used as efficiently as possible.

**6.4** Untreated raw fish should not be used as a feeding stuff for fish in seawater tanks.

**6.5** Where whole fish or parts of fish form part of the diet, they should be pasteurised, irradiated or otherwise processed to ensure that they are microbiologically safe.

***** END *****