

# ORGANIC FOOD FEDERATION



## Book 7

### AQUACULTURE STANDARDS

# GADOIDS

(Approved by DEFRA 25.03.05)

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## STANDARDS FOR ORGANIC GADOID FARMING

### 1. INTRODUCTION

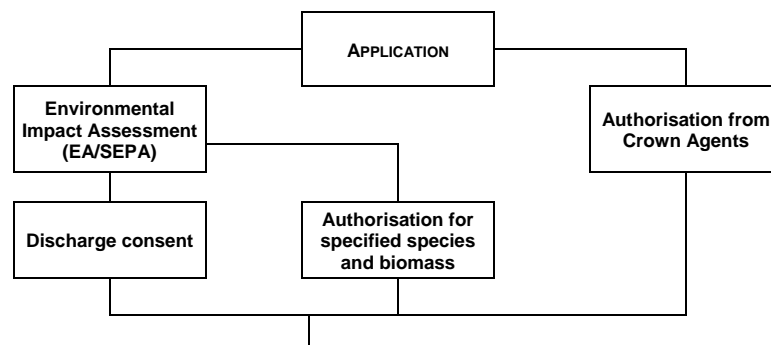
- 1.1 Aquaculture includes a wide variety of production methods involving many species in fresh, brackish and salt water. There are currently no Regulations in the EC specifically embracing organic aquaculture. These Standards cover farmed Gadidae from hatchery to sea cages. The family *Gadidae* include cod, haddock, pollocks, whiting, pouting, lings, rattails, grenadiers and torsk. The species of most interest to farming are:

Cod	<i>Gadus morhua</i>
Hake	<i>Merluccius merluccius</i>
Haddock	<i>Melanogrammus aeglefinus</i>
Pollock	<i>Pollachius pollachius</i>
Saithe	<i>Pollachius virens</i>

**Guidance Note:**

Conditions given in this document are specific to cod (*Gadus morhua*) and will be added to for other species as techniques for good farming practice become established.

- 1.2 The OFF Fish Farming Standards set out the management practices for organic fish farming which must be met and maintained in order for the organisms to be labelled as organically produced.
- 1.3 The OFF Fish Farming Standards must be considered in the context of a whole farm or farming system that is being managed organically.
- 1.4 The terms Permitted, Restricted and Prohibited are used in the document to define the level of acceptance of products and/or practices. A Restricted material or practice must have the approval of the Certification Body before being used.
- 1.5 These Standards also require compliance with all relevant Regulations which currently are covered by European and UK legislation. In particular, operators must be registered with their appropriate Fisheries Department and maintain records and standards that are demanded by these organisations. Operators must also fully comply as a minimum with planning and development regulations (see below), as well as all relevant legislation associated with abstraction of water and its discharge and environmental impact.



## 2. PRINCIPLES OF ORGANIC AQUACULTURE

- 2.1 The principles underlying organic farming systems are to maintain a healthy and sustainable aquatic ecosystem that is protective of the welfare of the species that are farmed. The system must be free from inputs prohibited by this standard and all reasonable precautions must be taken to minimise environmental pollution.
- 2.2 In addition to established principles for organic production, the following principles and aims also apply to organic aquaculture:
- The healthy use and proper care of water, water resources and all life therein
  - The maintenance or enhancement of water and benthic quality.
- 2.3 The basic objectives of organic fish farming systems are:
- The production of fish of prime quality, free from artificial ingredients and minimal contamination from the environment.
  - Production methods that use natural ingredients and minimise the use of external resources.
  - Management procedures that ensure minimal adverse effect on the local environment.
  - Promotion of health and welfare of fish by minimising stress, reducing the incidence of disease and nurturing the vitality of fish through meeting their physiological and behavioural needs.
  - Management to a high standard that minimises the need for veterinary intervention.
  - Avoidance of contamination by agricultural pesticides (*eg by run-off*)
  - The application of appropriate standards for the goods and services used by organic fish farms
  - The encouragement of the use of local resources and services.

## 3. LABELLING

- 3.1 Fish produced in accordance with these Standards must be labelled to show they have been farmed using a method of organic production associated with the 'organic' designation used in the sales description and in other literature as appropriate.

**Explanation Note:**

Fish can only be organic if they have been farmed in compliance with organic standards and have been certified as such. Wild fish including wild caught, on-grown juveniles are not accepted as organic and cannot be labelled as such

- 3.2 In addition to other statutory labelling requirements, the label must state the OFF reference number of the farm as well as having a clear traceability code to identify with the date of harvest.

**Guidance Note:**

this is the OFF operator number eg UKA4-00660 where 660 is the reference file number of the operator) The traceability code can be a harvest date or a pre-printed sequential number, the first and last of which can be recorded on the harvest record for traceability

## 4. MANAGEMENT AND CONTROL

- 4.1 An effective quality management system must be established and maintained sufficient to ensure and to demonstrate compliance with the requirements of these Standards at all times. In particular, the system must address the specific conditions pertaining to each operation in the areas of fish welfare, health control and environmental impact, detailing the measures (both current and progressive) necessary to ensure sound organic management in accordance with these Standards.

- 4.2 The operational requirements and control systems within the quality management system must be set out in a quality manual, which should be drawn up by the operator in consultation with relevant experts and agencies and prior to the first inspection.
- 4.3 The quality system should be provided with adequate resources in terms of personnel and equipment to operate effectively. A single individual should be appointed with defined authority and responsibility for the system's operation and maintenance. The quality manual should be made available to all personnel and steps taken to ensure it is understood, implemented, and maintained at all levels within the organisation.
- 4.4 The quality system must address the following areas, for which general management procedures and control must be detailed in the quality manual:
- a) The process of conversion
  - b) Environmental impact and water management
  - c) Fish welfare
  - d) Health control
- 4.5 In addition, the quality system should include the following components, which should also be detailed in the quality manual:
- a) A written statement setting out the quality policy of the certified organic operation.
  - b) Procedures for the control of all documentation relating to the effective operation of the system, including compliance with relevant legislation, presence for reference purposes at relevant locations, prompt removal of obsolete documents.
  - c) Procedures to review contracts with purchasers and suppliers in order to ensure terms, product specifications, verification of compliance, return of non-compliant goods and any subsequent changes to the contract are considered, agreed and understood by both parties.
  - d) Procedures to ensure that brought-in materials and services, which are critical to the organic integrity of the operation, conform to the specified requirements and where they do not, that they are identified, segregated and returned or otherwise prevented from inadvertent use.
  - e) Procedures to ensure proper storage of brought-in materials where appropriate.
  - f) Procedures for monitoring and controlling all production, packing and processing operations, especially the maintenance of fish welfare and health, water quality and environmental impact.
  - g) Procedures for checking accuracy of calibration of measuring and testing equipment.
  - h) Procedures to review product labelling, and promotional and advertising material relating to the organic products and their organic status in order to ensure the labels and claims are accurate, clear and in accordance with these standards.
  - i) Procedures for dealing with complaints, including responding to them, taking any resulting action and reporting them to senior management (and the person responsible for the procedure).
  - j) Procedures for enabling product recall where necessary (and the person responsible for the procedure).
  - k) Procedures for implementing corrective action to investigate and deal with non-compliances or other conditions issued by the Certification Body and any weaknesses identified through analysis of records, customer complaints, management reviews and other sources, together with follow up to ensure the corrective action is taken and is effective.
  - l) Procedures to assess periodically and identify staff training needs and to provide training where needed, including induction training for new entrants.
- 4.6 A critical review of the quality system should be carried out by senior management on at least an annual basis to verify the continuing effectiveness of the system in ensuring the requirements of these Standards are met.

## 5. CONVERSION

**Conversion is not required when a new fish farming operation commences. Licences and of permits to discharge are granted by the appropriate authorities on the basis of an Environmental Impact Assessment and strict rules are placed on the maximum biomass that can be produced.**

- 5.1 All young stock must be from a certified hatchery and reared from eggs from broodstock that have been kept in accordance with the OFF Aquaculture standards. A new hatchery may have 100% of its broodstock taken from the wild, however after the progeny from the original broodstock has reached maturity, F1 broodstock will be used. A maximum of 30% replacement of the brood-stock per annum will be permitted to be from healthy wild fish. (This is a measure required to refresh the gene pool.) The stock must be managed in accordance with these standards from the time of introduction until they are depleted.
- 5.2 Conversion is required only when a sea cage is located on the site where conventional fish feeding using synthetic materials and non-organic agriculturally derived materials has been carried out on the previous farming cycle. In such cases there must be a fallowing period of at least two months during which the benthic layer can recover. Thereafter the fish must be farmed strictly in accordance with OFF Standards. Further fallowing may be required if the benthic layer has not shown signs of recovery.
- 5.3 An organic production plan must be drawn up. The plan must be detailed in the operator's quality manual and must be drawn up in advance of the first inspection and in particular must include the history and existing situation of the unit, the conversion schedule and the changes to be made during the conversion process, the environment plan (as per 7.2) and the health plan (as per 11.2).
- 5.4 When a site has to be converted, all sections within that site must be converted. All stock on the site must be managed to OFF Organic Standards. All young stock entering the site must be from an approved hatchery.
- 5.5 Spare
- 5.6 Spare
- 5.7 A species cannot be managed as organic and non-organic on different units of the same holding. Different sites under the same management or ownership rearing organic and non-organic stock of the same species must be physically, operationally and financially separate from each other.
- 5.8 Once converted the organic units may not be switched between organic and non-organic management.

## 6. BREEDING AND YOUNG STOCK

- 6.1 Gadoid species should be chosen for their suitability to the local environment and the production of high quality food.
- 6.2 Breeding methods should be aimed at minimum interference with natural behaviour of the breeding animals and minimum application of highly technical/intensive rearing methods.
- 6.3 Parent stock, eggs and young stock must be kept and reared on dedicated organic production units. However parent stock may be derived from non-organic origin (see section 5.1) where a new operation is being established or a change of strain is required, provided they are managed to these Standards for 12 months before being used for breeding.

**Permitted:**

- a) Wild fish caught in local national waters (for the purposes of preventing inbreeding)

**Explanation:**

National waters extending to 12 miles (20km) from the coast of the country in which the farming enterprise is located

- b) Anti-parasitic bath (40-200ppm formalin) for wild fish caught for breeding purposes (*for their health and welfare and to prevent contamination of F1 broodstock*)

**Prohibited:**

- a) Triploid stocks.  
b) Genetically engineered species or strains.  
c) All-female stocks.  
d) Juveniles for on-growing collected from wild stock (other than those referred to in 5.1)  
e) Juveniles originating from broodstock that are not from local national waters

- 6.4 The rearing of organically produced fish must be supervised by personnel who are technically competent in the application of fish farming methods and who have an understanding of the principles and aims of organic production when they are applied to aquaculture.
- 6.5 The Brood-stock should be maintained within a natural temperature range of 5-15<sup>0</sup>C with the water being chilled to below 8<sup>0</sup>C to mimic the conditions which initiate spawning. Prior to spawning illumination should be controlled to mimic a normal day/night cycle. (*This does not necessarily need to be in phase with normal day/night cycle*)
- 6.6 Cod are batch spawners and produce a batch of eggs every 2 –3 days and up to 20 batches of eggs over the spawning period. Brood stock spawn readily and culling for egg stripping is not necessary or permitted. The depth of the broodstock tank must be sufficient for the fish to move naturally in the process of spawning and the population density must not exceed 10kg biomass per metre<sup>3</sup>. The water temperature at the time of spawning should be maintained at below 8<sup>0</sup>C.
- 6.7 Eggs which float must be collected from the spawning tank overflow in clean mesh bags and disinfected before transferring into incubation tanks. The tanks should be supplied with a constant flow of seawater maintained at a temperature of 6-8<sup>0</sup>C and which has been filtered and ultra-violet disinfected. Eggs may be sampled for microscopic examination to monitor the stage of development. At the temperature range above, hatching will normally take place between 10 and 14 days after the start of incubation. A further disinfection should take place 24-36hr before eggs are expected to hatch.
- 6.8 Acceptable disinfectants are:  
~~Hydrogen Peroxide~~ (*no longer permitted*)  
Hydrogen Peroxide and Peracetic Acid  
Ozonated water  
Chloramine T  
Iodophor

If the above disinfectants are intended for use on the livestock at any point in their lifecycle, their use must be clearly documented within the health plan.

**Guidance Note:**

- i) the above chemicals are potentially hazardous to operators and due precautions must be taken (as directed in COSHH data)  
ii) iodophores are not particularly effective at low temperature and in seawater

- 6.9 The disinfected eggs must be transferred to a clean larval tank. Over a period of time, while the larvae undergo endogenous feeding (from their own yolk) the water temperature needs to be increased gradually to around 10-14°C over a period of approx 3 days reflecting natural ambient temperature changes. During the larval stage the inflow of fresh seawater is increased but the rate must be controlled to avoid damage to the larvae.

**Restricted:** Allowing water temperature to rise to >14°C for larvae only

- 6.10 Larvae feeding must be initiated with live prey, such as rotifers (or any other live plankton cultured on site) and must be phased to ensure a gradual transition to inert compound feeds. Larger live prey items such as artemia or copeopods may also be used as a larger prey substitute for rotifers as the larvae grow. The live feeds should be fed for the first 30 days of feeding with a gradual transfer to compound diets of the appropriate small grade when the larvae are capable of feeding on them (have reached a minimum length of 12mm). To complement the live feed stages live algae (phytoplankton) should also be added to the larval rearing tanks to maintain a natural environment, as required by the developing larvae.

**Permitted:** Illumination throughout the larval stage to ensure the continuous growth of photosynthetic algae/phytoplankton, and to discourage cannibalism.

**Prohibited:** any organisms that have been genetically modified or produced using genetically modified substrates.

- 6.11 Best Practice in hygiene and tank management must be observed and documented at all times to minimise the likelihood of bacterial infections such as *Vibriosis* .
- 6.12 Juvenile cod must be transferred to nursery tanks for growing on. Cannibalism and hierarchical behaviour must be prevented by size grading to keep the population uniform and providing sufficient and correct quality feeds.
- 6.13 Juvenile fish may only be transported when they are fit and healthy and must be checked carefully before any transporting operation to verify this and to remove any that are not fit and healthy.
- 6.14 Transportation must be effected with care avoiding unnecessary fear and distress to the fish. The journey time should be kept at a minimum with the number and biomass of the fish in the transport container being such that their welfare is not compromised. Oxygenation should be provided during transit with oxygen levels being constantly monitored throughout the journey. The facility to adjust oxygen levels should be readily available. Carbon dioxide levels should not be allowed to rise to levels that harm the fish. Excessive changes in water temperature and pH must be avoided.

## 7. LOCATION AND ENVIRONMENTAL IMPACT

- 7.1 Without prejudice to section 1.5, careful management of the production unit and its integration with the environment are critical to the sustainability of the production system.
- 7.2 An environmental management plan must be developed and detailed in the quality manual. This should preferably be drawn up in conjunction with environmental experts and appropriate authorities. The plan must establish and define:
- a) Environmental loadings of the pre-converted unit and its impact on the surrounding area.
  - b) Appropriate controls or reductions of these loadings to achieve the levels set out in the standards for individual species.
  - c) Any initiatives for positive environmental management/enhancement.
  - d) Measures to prevent escapes and contingency plans to minimise impact should escapes occur.
  - e) Provision for monitoring the implementation of the plan.

- 7.3 Siting of production units must take into account the maintenance of the aquatic and terrestrial environment and ecosystem and the impact of the unit on wild stocks of the same or other species in the area.
- 7.4 Management strategies must be adopted to maintain and where possible enhance ecological diversity around the unit and maintain or enhance the local wildlife. Ponds, lakes, water channels, marine and other environments must be managed in accordance with the wildlife and conservation value of the area.
- 7.5 The production unit should be designed and managed to ensure that adverse environmental impact is minimised. The use of renewable energy sources and recycled materials should be used where possible.
- 7.6 The risk of escaped fish stocks from confined systems must be kept to an absolute minimum by appropriate documented strategies and procedures.

**Permitted:** The use of continuous lighting under spawning conditions to prevent sexual maturity.

**Explanation:**  
Gadoids reach sexual maturity when the water temperature and daylight conditions are suitable to induce spawning. This is prevented by continuous illumination in order to prevent the fish detecting the normal day/night cycle. Illumination can be switched off once the water temperature falls below the optimum for spawning.

- 7.7 With net pen sites, the impact on the benthic community below the net pens must be minimal and fall within the specific limits defined by the discharge permit/s for the site.
- 7.8 The development of environmental management procedures should be developed by agreement with neighbouring fish farmers and landowners and in consultation with the relevant NGOs.
- 7.9 The use of herbicides or other agro-chemical pesticides around tanks or otherwise on the unit are prohibited.
- 7.10 In addition to section 7.2 above, a documented environmental policy must also be drawn up and exercised to include measures taken in offices, storage facilities and transportation to prevent pollution, waste and usage of scarce resources.

## 8. WATER AND HOLDING FACILITIES

- 8.1 A consistently adequate supply of high quality water, appropriate to the needs of the species, is essential to ensure a clean and healthy environment for the stock.
- 8.2 Water quality must be monitored and recorded on a regular basis in accordance with the quality manual and as agreed with the Certification Body and the relevant environmental monitoring agency. The following parameters for the hatchery and juvenile tanks must be monitored:

- |                                   |   |
|-----------------------------------|---|
| a) Water temperature (eggs)       | 5-8 °C  |
| b) Water Temperature (larvae)     | 8-14 °C   |
| c) Water temperature (fry)        | 8-15 °C   |
| b) Dissolved Oxygen               | Target 100% saturation (min 6mg/l, 90% of the time )  |
| e) PH                             | 7-9   |
| f) Ammonia                        | max 0.6mg/l   |
| g) Input Flow rate (larvae & fry) | The physiological requirements of the fish must be met with regard to flow velocity and oxygen content. Similarly, any negative effect of accumulating waste substances and gases shall be avoided. |

8.3 At the sea cages, the quality of the seawater cannot be adjusted but it must be monitored on a daily basis. The following criteria must be measured:

- a) Water temperature
- b) Dissolved Oxygen
- c) Water clarity
- d) Tidal flow rate

8.4 Maintenance of a stocking density below 15kg/m<sup>3</sup> combined with good stock health and low stress are essential. Measures must be taken to provide and maintain an adequate supply of high quality water at all times.

**Permitted:** The stocking density may be kept at or below 15kg/m<sup>3</sup> by monitoring biomass and reducing the fish population by grading as the mean size increases. This is acceptable only when satisfactory precautions to prevent injury or stress on the fish being transferred to other cages have been taken. Only passive-grading systems approved by a recognised animal welfare organisation are permitted.

8.5 Non-organic production units/holdings and other potential sources of pollution that may affect the organic production unit must be identified and declared to the Certification Body. Organic production units must be sited sufficiently far from such sources of pollution, as determined by an environmental survey and agreed with the Certification Body, to ensure the risk of contamination is minimal.

8.6 Materials and compounds used in holding structures, production equipment and paints must not be detrimental to the environment or to stock.

8.7 Holding facilities must be able to be emptied without the risk of fish escaping or the discharge causing pollution and enable cleaning and disinfection where appropriate.

8.8 Cleaning and disinfecting regimes must be defined in the quality manual and must not adversely affect the surrounding environment or the water downstream.

8.9 Nets and floating structures must be securely moored, properly maintained and regularly checked to ensure they remain secure and undamaged. The construction material of net pens should be smooth enough to prevent risk of injuring fish during stormy conditions.

8.10 Only non-polluting methods may be used to ensure the nets are kept clear of weed and other fouling organisms.

8.11 In land-based systems, alarm systems and backup facilities must be sufficient to provide against water supply failure or other major problems.

**Preferred**

- a) Back-up aeration systems.
- b) Alarm systems.

**Permitted**

- a) Back-up oxygenation systems.
- b) Non-toxic anti-foulants.

**Restricted**

- a) Oxygenation systems only for fish welfare (applicable to hatchery only and **not** to enhance growth rate or permit higher stocking densities).

**Prohibited**

- a) Copper-based and other toxic anti-foulants.
- b) On growing and finishing systems under cover (i.e. solid roofing).

**9. DIET AND NUTRITION** (applicable to fish over 5g\*)

**Explanation:**

At the hatchery all compounded feeds applied, post live feed diet onwards, must be approved by OFF, and as a minimum requirement must be free from any inputs which are forbidden in this standard.

- 9.1 Diets for aquaculture production must meet the nutritional needs of the species appropriate to the stage in the life cycle.
- 9.2 The feed manufacturing premises and feed formulations must be inspected and certified as conforming to these Standards.
- 9.3 Preference should be given to feed ingredients that are not used for human consumption or are by-products of food for human consumption.
- 9.4 Feed ingredients of agricultural origin must be derived from certified organic origin. The use of the same agricultural ingredient in organic and non-organic forms is not permitted. A minimum of 95% of the agricultural or agriculturally derived ingredients in the total compounded feed used in the complete cycle of production should be of organic production.
- 9.5 A minimum of 50% of the feed ingredients of aquatic origin must be derived from the by-products of wild caught fish for human consumption. The balance not derived from such by-product must be derived from wild marine resources independently certified as sustainable or approved by a recognised control authority (such as through the Marine Stewardship Council).
- 9.6 In order to meet the nutritional needs of the stock, mineral and vitamin supplementation may be included in the diet in accordance with the general standards for livestock feeds.
- 9.7 The feed should be offered using methods that are appropriate to the species, its life stage, and natural feeding behaviour and minimising stress during feeding operations. Feeding behaviour must be monitored whilst feeding is in progress. Automatic feeding systems must be regularly checked and maintained in good working order.

**Permitted**

- a) Vitamins, minerals and supplements from natural origin.
- b) Natural binders.

**Restricted** (case of need to be approved by the certification body and documented)

- a) Chemically synthesised vitamins, minerals and supplements.
- b) Antioxidants and preservatives.
- c) Organic Acids as preservative (feed only)
  - E200 Sorbic acid
  - E236 Formic acid
  - E 260 Acetic acid
  - E 270 Lactic acid
  - E 280 Propionic acid
  - E 330 Citric acid

**Prohibited**

- a) Fishmeal from dedicated fishmeal harvesting and manufacturing operations that are not independently certified as sustainable.
- b) Fishmeal or other processed ingredients derived from farmed fish or terrestrial animals.
- c) Growth regulators, hormones or synthetic appetite stimulants.
- d) Feedstuffs derived by solvent extraction.
- e) Genetically modified organisms or products/ingredients derived from them.**
- f) Synthetic binders.
- g) High-energy diets (defined as more than 15% total oil) aimed at enhancing fish production or fast tracking.
- h) Any other substance or material not specified in the standards.

## 10. FISH WELFARE AND STOCK MANAGEMENT

- 10.1 Management must be based on the 'five freedoms'.
- Freedom from malnutrition
  - Freedom from thermal and physical discomfort
  - Freedom from injury and disease
  - Freedom from fear and distress
  - Freedom from unnecessary restrictions of behaviour
- 10.2 Management practices must ensure a low stress environment and allow the stock as far as possible to act according to their basic behavioural patterns.
- 10.3 Documented procedures must be drawn up by the operator and approved by the inspection body for all routines involving handling of stock, e.g. catching, grading, vaccination, transporting or administering permitted treatments, must be carried out with the aim of minimising stress.
- 10.4 The following welfare parameters as appropriate must be monitored and recorded on a regular basis within the water body of the holding facilities in accordance with the quality manual and as agreed with the Certification Body:
- a) Stocking density (max 15kg/m<sup>3</sup>)
  - b) Dissolved Oxygen
  - c) Water Cloudiness/Turbidity
  - d) Water temperature
- 10.5 The training needs of personnel engaged in the rearing of organically produced fish should be assessed and training given to individuals as necessary in accordance with the quality manual. Training should be given to ensure that personnel are competent for their assigned tasks and that they understand the importance of ensuring that the organic integrity of the fish is not compromised throughout the production cycle and up to the point of delivery of the harvested fish.
- 10.6 Stock should be inspected on at least a daily basis (except where weather conditions make this impossible) in order to check on their health and welfare and where appropriate to remove mortalities.
- 10.7 Mortalities must be recorded, accounted for and disposed of in a hygienic way to ensure there is no threat of disease spreading to farmed/wild stock or contamination of any watercourses.
- 10.8 Size distribution for fish should not compromise welfare or lead to hierarchical behaviour,
- 10.9 Predators must be discouraged from damaging or stressing fish stock by the use of effective means that are non-destructive both on target and non-target species and must be detailed in the quality manual. Relevant statutory bodies should be consulted in cases where specific predator problems arise.
- 10.10 Artificial light may need to be applied on a continuous basis for specified periods.

### Permitted:

- a) Continuous illumination post-hatching, at the larval stage, in order to ensure growth of phytoplankton, the change from continuous to a natural photoperiod must be gradual and must be achieved by the time the fish go to the sea cages.
  - b) Continuous illumination when conditions for spawning occur to prevent natural spawning in the sea cages that would result in the escape of eggs into the wild.
- 10.11 Fish may be crowded only to allow access to them to facilitate capture, or for grading, as required.

- 10.12 Adequate provision must be made, if necessary, for shading, especially for young stock in shallower holding facilities.
- 10.13 Movement of growing fish between sites (excluding young stock from the rearing facilities) is prohibited.
- 10.14 The RSPCA Welfare Standards for Farmed Fish can be used as a basis of reference for any matters not specifically covered by these standards.

## **11. HEALTH CONTROL**

- 11.1 Sound organic management aims to produce healthy stock by best practice, including good stockmanship, appropriate nutrition, minimising stress, encouraging a high level of resistance to disease and appropriate preventative measures. The well being of the stock is paramount.
- 11.2 A health plan must be developed, preferably in conjunction with the farm's designated veterinary surgeon. The plan must form part of the quality manual and should cover the following areas:
  - a) General health and welfare of the fish on the unit
  - b) Identification of the main health issues on the unit and the measures to reduce or eliminate them
  - c) Measures to minimise disease outbreaks and encourage fish health generally.
  - d) Identification of specific veterinary treatments, in accordance with these Standards, for use where necessary.
- 11.3 Management practices must aim to build positive health in order to prevent the need for veterinary medicinal treatment.
- 11.4 If illness does occur, treatment should be directed at complementing the animal's natural powers of recovery and correcting the imbalance that created the disorder, rather than just dealing with the symptoms. Rapid diagnosis must be made and appropriate action taken in consultation with the farm's veterinary surgeon. Where possible the affected stock should be isolated and quarantine procedures brought into operation.
- 11.5 Treatment must be given even if the stock will lose its organic status. Failure to treat could lead to criminal prosecution under welfare regulations and the fish farm losing its Certification.
- 11.6 Withholding periods for stock treated with licensed veterinary medicines prior to entering the food chain shall be twice that defined in the product license or by the prescribing veterinarian and shall not be less than 14 days.
- 11.7 Approved vaccines shall be used against the common diseases of the farmed species and the operator must have a documented vaccination strategy. The vaccines used must be directed to prevention of a specific disease risk.

**Explanation:**

The use of vaccination as part of a planned health and welfare strategy is preferred to the use of antibiotics for treatment of diseases that could have been prevented by vaccination.

Vaccination can protect farmed fish from diseases carried by wild fish, but is equally important in preventing endemic diseases of farmed fish which can infect wild fish

- 11.8 Prior authorisation from the certification body should be sought if it is thought necessary and justified on welfare grounds to administer medication within the feed ration. Medication in feed may not be administered as a general preventative.

**Permitted**

- a) Iodophore, for disinfection of equipment.
- b) Chloramine T, Hydrogen peroxide, Hydrogen peroxide/Peracetic acid for egg disinfection, subject to prior approval.
- c) The use of anaesthetics for handling individual fish.

**Explanation:**

No specified anaesthetics have been approved or prohibited, but those used must comply with any current regulatory standards. The only licenced anaesthetic for finned fish is Tricaine Methane Sulphonate (aka MS222)

- d) Immunostimulants – only approved products given under veterinary guidance for therapeutic use to assist the fish to overcome stressful situations or illness.

**Restricted** (*ie only with documented and justified case of need*)

The use of antibiotics in clinical cases where no other remedy would be effective.

**Explanation:**

Within the lifetime of a stock, a maximum of three courses of treatment may be given subject to there being a documented veterinary case of need, however the recommended withdrawal periods must be observed and no stock may be depleted until double the withdrawal period has been completed. Where no withdrawal period has been given a withdrawal period of 500 degree days will be observed.

**Prohibited**

- a) Prophylactic use of veterinary medicinal products except to prevent infection from a known disease risk.
- b) **Genetically engineered vaccines.**
- c) Hormone treatment of fish for human consumption.
- d) Malachite green (for treatment of water and fish).
- e) Synthetic pesticides, including organophosphate, pyrethroid and ivermectin products.
- f) Other chemically synthesised allopathic veterinary medicinal treatments not mentioned in these Standards.

## 12. HARVESTING

- 12.1 The handling of stock during harvesting and slaughtering operations must be carried out with minimal disturbance and stress using procedures as outlined in the quality manual and agreed with the Certification Body.
- 12.2 Fish should be held in high quality water for the duration of the allowed fasting period prior to slaughter.
- 12.3 Fish must be killed by a method that renders them instantly insensible immediately they are taken from the water.
- 12.4 Staff involved in killing fish must be skilled and knowledgeable to perform the task efficiently and humanely as required by the Welfare of Animals (Slaughter or Killing) Regulations 1995.
- 12.5 Fish processing storage and transport operations must comply with the general standards for processing of organic foods, and with all relevant statutory regulations and local authority hygiene regulations.
- 12.6 Spare
- 12.7 Permitted
- a) Concussion to the head followed by severing the gill arches.
  - b) Electrocutation.
- Prohibited
- a) Slaughtering using ice, ice slurry or carbon dioxide.
  - b) Suffocation (leaving fish to die in air)
  - c) Ex-sanguination without stunning.
- 12.8 Strict hygiene must be observed during slaughtering and evisceration to ensure adequate cleanliness. The disposal of blood water, viscera and subsequent cleansing and disinfection agents, should pose no threat to wild/farmed fish or the environment and be in conformity with Regulation (EC) No 1774/2002 and all other local or national environmental regulations.

### 13. RECORDS

- 13.1 Detailed, legible, accurate and up to date records must be kept of all physical and financial operations and activities, sufficient to demonstrate compliance with these standards. Records must be kept for a minimum of the life of the stock, including broodstock, plus three years and must be made available to inspectors or other authorised persons.
- 13.2 The following records must be kept:
- a) The name, position and authority of the person with overall responsibility for the organic production operation.
  - b) Details of the responsibility and authority of all other key personnel, including their named deputies, who supervise or verify the organic production operation.
  - c) The name, address and telephone number of the designated Veterinary Surgeon.
  - d) Staff training records.
  - e) Details of calibration for all identified measuring/testing equipment and instruments used for checking conformity with critical requirements, including action taken if any piece of equipment or instrument is found to be out of calibration.
  - f) Details of complaints, responses made and consequential actions taken.
  - g) Details of any corrective actions taken and any changes in procedures made.
- 13.3 The following general husbandry records must be kept:
- a) Stock purchases, including, as appropriate, date, species, age, quantities, origin, status and history.
  - b) Stock movements.
  - c) Purchases, date, quantities and details of use of all materials and inputs.
  - d) Specifications for other purchased materials and services which have a critical bearing on the organic integrity of the fish produced and supplied under an organic designation.
  - e) Details of all management activities as defined in the quality manual (fallowing and rotation of enclosures/cropping, grading, etc).
  - f) Measurements of all water and environmental parameters as defined in the quality manual.
  - g) Nature, quantities and details of all stock harvested and sold (quantities sold direct to the consumer must be accounted for on a daily basis).
  - h) Mortalities and the cause for death where this can be established or surmised.
- 13.4 The following feed records must be kept, as appropriate:
- a) Specifications for fish feed.
  - b) Feed purchases, including specification and sources.
  - c) GMO status of the feeds/constituent parts.
  - d) Lot identification and daily quantities of feed fed to each batch of stock.
- 13.5 The following veterinary records must be kept:
- a) Purchases, dates, quantities, source and nature of all veterinary medicinal products.
  - b) Details of all stock treated, including dates, identity and number of stock, treatment (name and manufacturer), quantities used and name of the person who administered the treatment.
  - c) Details of vaccinations and other treatments.
  - d) Length of withholding period, quarantine measure if appropriate and earliest date for sale of the stock.

## GLOSSARY OF TERMS USED IN THIS STANDARD

<b>Agricultural origin</b>	Plant or animal materials that are produced by land farming operations, or processed materials that are derived from them.
<b>Aquaculture</b>	The contained or enclosed production of fish, shellfish (or plants) in an enclosed water environment under controlled or monitored conditions.
<b>Artemia</b>	Brine shrimp, a small crustacean that is used as a live feed for marine fish larvae. It has a resting stage that is encysted and can be stored dry. The cysts are collected and marketed commercially. They hatch to give free-swimming nauplii that are commonly used as an early feed for fish larvae. Artemia generally need to be enriched with algae or lipid emulsions to improve their nutritional quality for the fish
<b>Benthic</b>	Associated with the seabed.
<b>Benthic community</b>	The fish, shellfish and phytoplankton and plant life existing on the sea bed
<b>Benthic layer</b>	The surface of the seabed.
<b>Biomass</b>	The total weight of fish which is contained in a given weight of water
<b>Brood-stock</b>	Fish kept for the purposes of spawning
<b>COSHH</b>	Control of Substances Hazardous to Health
<b>Demersal</b>	Living and feeding at the benthic layer
<b>Environmental Impact Assessment (EIA)</b>	A formal process that provides a detailed study of the environment in an attempt to identify, predict and assess likely consequences of proposed activities.
<b>Fallowing</b>	The act of leaving a sea cage or enclosure free from fish stock for a period of time so that the benthic community can recover from the affects of faecal and feed waste arising from aquacultural / maricultural activity.
<b>Fishmeal</b>	The main constituents of fish feed are fishmeal and fish oil. Fishmeal is comminuted (ground or minced) fish produced as a by-product of fish processing or from fish caught in sustainable fisheries. Fishmeal processors also produce fish Oil.
<b>Fry</b>	The early life history stage of a fish immediately after hatching, during which it relies yolk for its nutrition: sometimes called a yolk-sac larva
<b>Gadidae</b>	This is the family of which cod is a member.
<b>Hatchery</b>	The premises in which spawning is conducted, eggs collected and fertilised and then grown on to a size where a palletised feed regime can begin.
<b>Larvae</b>	The early life history stage of a fish, after hatch when it is able to feed independently and its appearance is distinct from that of a small adult.
<b>Mariculture</b>	The production of fish, shellfish (or plants) in an enclosed seawater environment under controlled or monitored conditions.
<b>Pelagic Permitted</b>	Living in open water between the sea bed and the surface Permitted without reservation

<b>Photosynthetic algae</b>	The algae are one group of aquatic plants that include single celled microscopic forms and the seaweeds. Like other photosynthesing plants they contain pigments that absorb light as an energy source, and take up carbon dioxide as a source of carbon to grow. They produce oxygen as a by product.
<b>Phytoplankton</b>	The microscopic aquatic plant life, mostly single celled, that drifts with the body of water
<b>Prohibited</b>	Not permitted under any circumstances
<b>Restricted</b>	Permitted subject to there being a documented case of need which is acceptable to the certification body
<b>Rotifer</b>	A small planktonic animal that reproduces asexually that is cultured as a live food for first feeding marine fish larvae that are too small to eat Artemia. Rotifers need to be enriched with algae or lipid emulsions to improve their nutritional quality for the fish.
<b>Sea Cage</b>	A netting enclosure located in tidal seawater. It may be square or circular in vertical cross section. The enclosure is supported at the surface and terminates several metres above the seabed.
<b>Stocking density</b>	The quantity of fish that are stocked in a given volume of water Usually referred to in terms of kg per unit volume of water (see Biomass)
<b>Sustainable</b>	Activities which do not reduce the biodiversity of an environment (terrestrial or marine) and which ensure that the needs of the species living in that environment are supported now and in the future are said to be sustainable.
<b>Triploid</b>	Having three sets of chromosomes in each cell, instead of the normal two copies (Diploid)
<b>Vibriosis</b>	A bacterial infection which is common to many species of fish including gadidae.
<b>Welfare</b>	Maintenance of the health and well being of farmed species to prevent injury or mortality due to disease or other unnatural behaviour. Avoidance of stress caused by excessive handling, crowding or poor water conditions.
<b>Wild fish</b>	Fish that are not farmed or managed by human intervention and are free to pursue their natural food sources.
<b>Young stock</b>	Fish that are large enough to be introduced into the rearing phase of aquaculture/mariculture. They will be sufficiently weaned to accept the smallest size of pelleted feed.

**Organisations:**

SEPA	Scottish Environmental Protection Agency
CEFAS	Centre for Environment Fisheries and Aquaculture Science (an agency of Defra)
Defra	Department for Environment, Food and Rural Affairs