

## CHAPTER 4.7.

# HANDLING, DISPOSAL AND TREATMENT OF AQUATIC ANIMAL WASTE

### Article 4.7.1.

#### **Introduction**

The objective of this chapter is to provide guidance on storage, transport, disposal and treatment of *aquatic animal* wastes so as to manage *risks* to *aquatic animal* health. The recommendations in this chapter are general in nature. The choice of one or more of the recommended methods should comply with relevant local and national legislation.

Disposal methods should take into consideration a range of factors, including the cause of mortality. It may be appropriate to carry out a *risk assessment* on the disposal options.

In the case of killing of animals for disease control purposes or unusually large mortalities, this may require approval from, or supervision by, the *Competent Authority*.

In the event of *aquatic animal* mortalities of a significant nature in *aquaculture* or in the wild, the *Competent Authority* should be notified so that necessary steps can be taken to dispose of the dead *aquatic animals*, in order to minimise the *risk* for possible spread of *aquatic animal disease*.

### Article 4.7.2.

#### **Scope**

The scope of this chapter covers *aquatic animal* waste derived from: i) routine *aquaculture* operations; ii) on shore processing, irrespective of origin; iii) mass killing for disease control purposes and iv) mass mortality (including in the wild).

### Article 4.7.3.

#### **Definitions**

*Aquatic animal* waste means the entire body or parts of *aquatic animals* that have died or been killed for disease control purposes as well as slaughtered *aquatic animals*, and their parts, that are not intended for human consumption.

High risk waste means *aquatic animal* waste that constitutes, or is suspected of constituting, a serious health *risk* to *aquatic animals* or humans.

Low risk waste means *aquatic animal* waste that is not high risk waste.

### Article 4.7.4.

#### **Governance**

The *Competent Authority* should oversee the efficient and effective disposal of *aquatic animal* waste. Cooperation among all relevant agencies and stakeholders involved in *aquatic animal* health is necessary to ensure safe handling and disposal. In this context the following aspects should be addressed:

- 1) physical, logistical and data access by relevant personnel, in cooperation with stakeholders, including access of the *Competent Authority* to the *aquatic animal* waste;
- 2) movement controls and the authority to make exemptions under certain *biosecurity* conditions, for example for transport of *aquatic animal* waste to another location for disposal;

- 3) the determination of the method and location of disposal, and the necessary equipment and facilities, by the *Competent Authority*, in consultation with other authorities including government organisations responsible for the protection of human health and the environment.

#### Article 4.7.5.

##### **Storage, transport and labelling**

Following collection, *aquatic animal* waste should be stored for the minimum time practical; however, where storage is necessary there should be sufficient capacity for the expected waste and the *Competent Authority* may require additional measures.

The storage area should be separated from *aquaculture* sites and bodies of water to minimise the *risk* of spread of *pathogenic agents*. The containers of stored *aquatic animal* waste should be leak-proof and secured to prevent contact with *aquatic animals*, other animals or birds and unauthorised personnel.

*Aquatic animal* waste infected by an agent causing a *disease* referred to in the *Aquatic Code* or suspected of being so, may not be transported without permission from the *Competent Authority*. The *Competent Authority* may assess the requirement for this condition based on the disease situation in the Member Country (e.g. where a *disease* referred to in the *Aquatic Code* is enzootic in the Member Country).

If low risk waste becomes contaminated with high risk waste, such waste should then be considered high risk waste.

Containers used for transport of *aquatic animal* waste should be leak-proof and labelled regarding content. Transport should be accompanied by appropriate documentation detailing origin, content and destination to allow tracing if required.

Equipment used for transportation should be cleaned and disinfected before being returned, as described in Chapter 4.3.

#### Article 4.7.6.

##### **Approval and operational requirements of disposal plants**

###### 1. Requirement for approval

All disposal plants dealing with *aquatic animal* waste should be approved by the *Competent Authority*. However, disposal plants using only low risk waste for production of products not intended to be used in animals may be exempted from approval but should be registered by the *Competent Authority*.

###### 2. Conditions for approval

For a disposal plant to be approved to deal with *aquatic animal* waste, it should:

- a) be adequately separated from thoroughfares through which contamination may be spread, other premises (such *aquaculture* facilities, slaughterhouses, processing plants) and bodies of water, so as to minimise the *risk* of spread of *pathogenic agents*;
- b) be designed and equipped to the satisfaction of the *Competent Authority*;
- c) have access to approved or accredited laboratories;
- d) fulfil requirements for handling the *aquatic animal* waste and products specified by the *Competent Authority*.

Any substantial proposed changes to the disposal plant should be approved by the *Competent Authority*.

Approval should be withdrawn or suspended, as appropriate, if a disposal plant no longer fulfils the criteria given by the *Competent Authority*.

###### 3. Operating requirements

The disposal plant should operate using procedures that minimise the *risk* of spread of *pathogenic agents*, including:

- a) separation of clean and unclean areas, including consideration of workflow, and good hygienic procedures for personnel;
- b) equipment and surfaces should be easy to clean and disinfect;
- c) handling and treatment of *aquatic animal* waste should take place as soon as possible after being received;
- d) effluent waste water should be collected and disinfected before leaving the premises;

- e) incorporating measures to prevent access of birds, insects, rodents or other animals to the disposal plant;
- f) a system for registration and labelling of material for tracing purposes.

A system for internal control, identifying critical points and means of control for such points, should be in place at the disposal plants. A general documentation system for internal control including sampling for control of critical points should be established.

Spot checks of batches should be carried out to check the microbiological standards following processing. Products from incineration plants may be exempted from such checks. The *Competent Authority* may grant exemptions on specified conditions.

If testing of the product from processed high risk waste shows that the product is not satisfactorily produced and thus poses a *risk* for the spread of *pathogenic agents*, disposal plants should report immediately to the *Competent Authority* who may then require additional measures. These products should not be transported from disposal plants without permission from the *Competent Authority*.

Results from the different samples and checks should be kept for a given period decided upon by the *Competent Authority*. Analyses and sampling should be carried out in accordance with international standards.

Disposal plants applying treatments based on time and pressure should be able to measure and record these parameters.

Disposal plants should maintain records related to quantity and type of raw material received, supplier, quantity and type of finished product, receivers, critical check points, and deviations from provisions stipulated in relevant regulations. These should be made available to the *Competent Authority* on request.

#### Article 4.7.7.

### Methods for disposal of high risk waste

Recommended methods for disposal of high risk waste from *aquatic animals* are as follows:

#### 1. Rendering

Rendering will inactivate all of the known *aquatic animal pathogenic agents*.

Rendering is generally carried out in a closed system using a combination of mechanical treatments and time/temperature combinations leading to stable, sterilised products, such as fish *meal* and fish oil.

The process typically involves pre-heating to 50–60°C, followed by cooking of the raw waste at 95–100°C for 15 to 20 minutes. The oil and proteins are separated by pressing and centrifuging involving temperatures of 90°C. The production of *meal* involves further high temperature treatments.

#### 2. Incineration

Incineration is a controlled burning process carried out in fixed incinerators or mobile air curtain incinerators. Mobile air curtain incinerators enable the process to be carried out on site thus removing the need to transport the *aquatic animal waste*.

Incinerators may only be capable of handling limited volumes of *aquatic animal waste*.

#### 3. Sterilisation

The minimum requirement for sterilisation is a core temperature of at least 90°C for at least 60 minutes, but other time/temperature combinations are also available and effective.

#### 4. Composting

Composting does not inactivate all *pathogenic agents*; therefore, high risk waste should be heated (85°C for 25 minutes or an equivalent temperature/time combination) prior to the composting process.

Effective composting depends upon a combination of pH, temperature, moisture and time factors. Depending on the type of composting (e.g. windrows, closed vessel) and the raw material used, as well as the climatic conditions, the temperature parameters of the process and the heat distribution in the material may be different.

When held in windrows, the entire material needs an exposure time of at least two weeks at 55°C, while in closed vessels exposure to 65°C for one week is required.

5. Biogas production

Biogas production does not inactivate all *pathogenic agents*; therefore, high risk waste should be treated to ensure inactivation of *pathogenic agents* prior to the biogas production process. The method chosen should be shown to inactivate the *pathogenic agents* of concern.

Biogas production is a process whereby organic matter in biological waste products is fermented under anaerobic conditions.

The two main types of biogas production are mesophilic anaerobe digestion and thermophilic anaerobe digestion. Both processes are normally continuous, and a portion of the end material is removed every 2–12 hours. There is a risk that new material which has been in the reactor for only 2–12 hours may be removed with the finished products.

6. Ensiling

Ensiling does not inactivate all *pathogenic agents*; therefore, high risk waste should be heated (85°C for 25 minutes or an equivalent temperature/time combination) prior to the ensiling process.

Ensiling of *aquatic animal* waste in an organic acid such as formic acid is an effective method of inactivating most *pathogenic agents* within 48 hours. The pH in the ensiling process should be maintained at, or below, 4.0 throughout the process.

7. Burial

Burial may take place either in a landfill site or other locations approved by the *Competent Authority* based on *risk assessments* as regards *aquatic animal* health, public health and possible environmental impacts.

Whenever possible, the *aquatic animal* waste should be subjected to a treatment that ensures inactivation of the *pathogenic agents* prior to burial.

In selecting an acceptable burial site, consideration should be given to the following:

- a) Location – the possible effects of the fire's heat, smoke and odour on nearby structures, underground and aerial utilities, roads and residential areas. The site should be surrounded by an adequate firebreak.
- b) Access – easy access for equipment and delivery of *aquatic animal* waste. Fencing and restricted admittance may be necessary.
- c) Pit construction – rocky areas should be avoided. Soils with good stability, capable of withstanding the weight of equipment used to dig and fill the pits, should be selected. If required, diversion banks can be constructed to prevent surface runoff entering the pit or to prevent any liquids escaping from the burial site. Pit dimensions depend on the volume of the *aquatic animal* waste to be buried and should be easy to fill.
- d) Pit closure – contents should be covered with unslaked lime (CaO) at a rate of 85 kg per 1,000 kg of *aquatic animal* waste to hasten decomposition and prevent scavenging.

8. Pyre-burning

Pyre-burning may not be suitable for large amounts of *aquatic animal* waste.

In selecting an acceptable pyre-burning site, the following considerations are important:

- a) Location – the possible effects of the fire's heat, smoke and odour on nearby structures, underground and aerial utilities, roads and residential areas. The site should be surrounded by an adequate firebreak.
- b) Access – for equipment to construct the pyre and maintain the fire, for the delivery of fuel and *aquatic animal* waste.

Pyre-burning needs considerable amounts of fuel and all required fuel should be on site before the burning is started. If the pyre-burning is carried out correctly, *aquatic animal* wastes will be destroyed within 48 hours.

When leaving the pyre-burning site, *vehicles* and containers should be disinfected.

Alternatively, high risk waste may be disposed of by any methods, approved by the *Competent Authority*, which ensure an equivalent reduction of *risk*.

Article 4.7.8.

### Methods of disposal for low risk waste

Low risk waste can be disposed of using all methods described in Article 4.7.7. In the case of composting or biogas production it is not necessary to heat treat the low risk waste prior to disposal.

Alternatively, the following methods may be used:

1. Ensiling

Ensiling of *aquatic animal* waste in an organic acid such as formic acid is an effective method of inactivating most *pathogenic agents* within 48 hours. The pH in the ensiling process should be maintained at, or below, 4.0 throughout the process.

The *Competent Authority* may require ensiling as a treatment prior to one of the disposal methods described in Article 4.7.7.

2. Pasteurisation

Pasteurisation does not inactivate all *pathogenic agents*. Heat treatment at temperatures below 100°C can be considered as pasteurisation. Pasteurisation may use a range of time/temperature combinations.

In addition, the *Competent Authority* may permit low risk waste to be disposed of by other means, or used for any other purposes, following an *assessment of the risk* from such methods or uses.

Article 4.7.9.

**Mass mortality events**

Mass mortality of *aquatic animals* can arise from natural events or killing for disease control purposes (refer to Chapter 7.4.). This may lead to the need for disposal of large numbers of dead *aquatic animals* and is often subject to intense public and media scrutiny. The *Competent Authority* should conduct disposal operations within acceptable scientific principles that will address the *risks* of spread of the *pathogenic agent*, and public and environmental concerns.

1. Preparedness

Successful disposal with minimum delay is achieved by advance planning and preparation:

- a) Preparedness planning should engage other relevant government agencies and stakeholders such as industry organisations, animal welfare organisations, emergency response organisations, and media.
- b) Standard operating procedures should be developed (including documented decision-making processes, training of staff).
- c) Pre-arranged mechanisms to access emergency funding for the disposal operation.
- d) Information sharing with officials involved in the disposal operation, stakeholders, politicians and the media is essential. A well informed spokesperson should be available at all times to answer enquiries.
- e) Resource readiness planning should address such items as personnel, transport, storage facilities, equipment, fuel, protective clothing and logistical support. Special equipment, such as well boats, may be required.

2. Critical elements

Critical elements which need to be considered in planning and implementation include:

- a) rapid disposal of the dead *aquatic animals*;
- b) methods of treatment and disposal should address capacity issues and the *risks* of spread of *pathogenic agents*;
- c) adequate funding and staff resources;
- d) addressing the *risk* of spread of *pathogenic agents* by vectors and fomites;
- e) stakeholder cooperation;
- f) safety of personnel;
- g) environmental concerns;
- h) societal acceptance.

3. Choice of disposal methods

The *Competent Authority* may determine the dead *aquatic animals* to be either high risk waste or low risk waste and select an appropriate disposal method in accordance with the risk (refer to Articles 4.7.7. and 4.7.8.).

Should the chosen disposal option be applied near the border of a neighbouring country, the *Competent Authority* of that country should be informed.

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