

Best Practice Guidelines for Pacific Oyster Producers



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Background

This document provides guidance to Pacific Oyster producers in strengthening on-farm biosecurity measures and on potential measures to assist in minimising stock losses associated with disease. Its objective is to assist farmers in avoiding disease introduction, and to minimise the impact of disease outbreaks should they arise.

This is a working document which reflects the current status of knowledge regarding best practice with regard to disease and mortality in *C. gigas*. It represents an assimilation of information gathered and discussed during periodic meetings held with Irish *C. gigas* producers since 2016.

1. Husbandry Practices

Following good husbandry practices is crucial to maintaining the health of farmed stock. Practices which lead to increased stress in animals will increase the chance of infection from pathogens present in the environment, which in-turn may result in the development of disease outbreaks. Good husbandry practices should therefore aim to minimise stress.

1.1 In-bag stocking densities (standard bags & trestles)

In-bag stocking densities are important and, whilst these should be kept as low as possible, site-specific differences should also be taken into account e.g. In more exposed sites the density for seed needs to be higher than in less exposed bays otherwise bags will move too easily, potentially damaging the seed. Whereas in fast growing bays, densities should generally be lower than in slower growing bays.

As a general principle however, lower stocking densities allow for a more homogeneous growth which will require less handling and causes less stress to the stock as a result.

Recommendations

- Maintain appropriate in-bag stocking densities for the conditions on site, whilst aiming to keep them as low as possible at all times
- Optimal Stocking Densities (Draft Aquaculture Explained Manual, BIM)

<u>Bag Size</u>	<u>Maximum S.D./Bag</u>
4mm	2,000
6mm	500
9mm – 14mm	100

1.2 Site Level Stocking Density

Whilst reducing in-bag density is likely to have a more significant effect on the health of stocks, reducing stocking density across the site will also reduce infection pressure simply by decreasing the number of animals present on the site at any one time. Increasing the spacing between trestles can also reduce silt build-up on certain sites, which will create a 'cleaner' environment for the oysters.

Recommendations

- Where possible, decrease the number of oysters on site
- Maximise the distance between trestles within the constraints of the site

1.3 Biofouling

Biofouling on bags can reduce water flow and food delivery, potentially impacting on growth rates and quality of oysters, and increasing stress to the stock. Other than during periods when temperatures are very high, build-up of weed on bags should be avoided. However, during high summertime temperatures, the retention of some weed on the bags can help to protect the oysters by reducing in-bag temperatures.

Recommendations

- As a general rule, biofouling on bags should be kept to a minimum. The exception to this rule occurs during high summertime temperatures, when the retention of some weed on the bags helps to keep in-bag temperatures as low as possible, thereby decreasing stress on the animals.

1.4 Grading / Handling

Vigorous turning and grading can lead to shell damage and increased stress in oysters. Therefore, practices that limit the impact of handling will reduce levels of stress. This can have a beneficial effect in limiting the impact of disease outbreaks and increasing survival rates. The period between May and September has been identified as a high-risk period during which excessive or unnecessary handling should be avoided. Where possible, handling, and especially vigorous shaking, should be avoided altogether in July and August.

Recommendations

- Avoid unnecessary handling of stock especially between May and September. Where this is unavoidable, there should be no rough handling of stock during this period.
- Use water graders if available.
- When using traditional graders, add water to the feeder hopper and to the bin at the end of the grading line to reduce handling stress
- Return oysters to the water as soon as possible after grading.

2. Stock

The introduction of new stock onto aquaculture sites represents the most significant risk of disease introduction. The source of stock, its size at introduction, and the number of introductions to the site are all important factors to be considered.

The fish health legislation states that oysters cannot be moved from an area with on-going mortality. Where there is doubt as to whether this requirement is being met in the site/country of origin; then the purchaser of the stock should make their own enquiries before accepting new stock. For additional assurance, the purchaser may request testing at source and consult with the Marine Institute in relation to this.

Strategies such as bulk buying of stocks which allow operators to reduce the number of individual introductions to their sites as well as giving operators more power to control the timing of introductions and to request disease testing are worthy of exploration at a bay level, or even more widely.

There has been a growing trend in relation to the movement of half-grown and adult oysters both within Ireland and into the country from elsewhere. The suitability of such movements should be assessed on the basis of the potential increased disease risk this practice may pose. Where the risks are deemed to be significant, the movements should not occur. Advice on this may be sought from the Marine Institute.

Where possible, all stock movements should be avoided in the summer months.

Recommendations

- Source stock from an area of equal or higher health status than the bay in which you operate. This relates to both listed and non-listed diseases.
- Request information on the mortality and disease situation in the area where you are sourcing stocks.
- Do not move stock from sites where unresolved mortality is occurring to other growing sites
- Do not move half-grown or adult oysters for relaying, where the disease risk posed by such movements outweigh the potential benefits.
- If mortality is evident in incoming stocks DO NOT relay them. Contact the Marine Institute immediately to request disease testing. This can be done through the text alert system (087 1847285) / by phone (091 387200) / by email (notification@marine.ie).
- Keep up to date records of stock movements and mortality as per your FHA

3. Cleaning & Disinfection

Pathogens can survive in organic material attached to equipment, people and vehicles. The use of appropriate cleaning and disinfection protocols are critical to limiting the spread of aquatic pathogens.

3.1 Bags & Trestles

Before reuse, bags and trestles, should be thoroughly cleaned to remove all organic matter. Large scale disinfection of bags and trestles after cleaning is the best way to prevent pathogen spread. However, this may not be practical unless the cleaning and disinfection process can be carried out away from the shore and / or safe disposal of the cleaning and disinfection wash water is possible.

Where disinfection of bags and trestles is not possible, the use of warm-water power washing can effectively remove organic material from bags and this should be considered. Desiccation is considered a suitable alternative to disinfection provided complete drying of the equipment is achieved for a period of time which is sufficient to kill any pathogens which might be present. Where possible, bags should be stored in direct sunlight as this method provides three potential disinfection actions, i.e. UV irradiation, heating and desiccation. (OIE, Aquatic Code 2016).

Recommendations

- Clean bags and trestles thoroughly to remove all organic material
- If possible, disinfect all bags and trestles after cleaning
- Desiccate bags for a minimum of 30 days before reuse

3.2 People, Equipment, Vehicles and Vessels

The risk posed by the movement of staff, equipment, vehicles or vessels between sites is well recognised. Where producers have sites in more than one bay, separate equipment should be kept for each site where practical. If this is not possible, disinfection is required before moving between sites. Information is available on www.fishhealth.ie regarding disinfectants and their use in aquaculture.

Record keeping in relation to cleaning, disinfection and aquaculture related visitors to your site is mandatory and must be recorded in the Shellfish Health Record Book which has been provided by the Marine Institute. Where a visitor to your site poses a disease risk, appropriate disinfection measures should be put in place before the individual accesses the site or the stock.

Recommendations

- Where site specific personnel and equipment are not available, disinfect all personal protective clothing, equipment, vehicles or vessels moving between aquaculture sites in different bays
- Keep records of all cleaning and disinfection carried out
- Keep a record of all visitors to the site

4. Staff Awareness & Vigilance

Staff awareness and vigilance in monitoring stocks is critical to the early detection of disease problems. The earlier a problem is detected the more effectively it can be dealt with, ensuring limited impact on stocks. Training should be provided to all staff in relation to the biosecurity plan for the site (including identification of pests and disease risks).

Recommendations

- Ensure all staff are aware of the potential pathways of disease introduction and the need for vigilance with regard to mortality
- Check stock regularly and thoroughly
- Monitor stocks carefully during higher risk periods (i.e. when temperatures are high, when there are disease outbreaks elsewhere, etc.)
- Keep records of all relevant husbandry, production and environmental factors such as handling, stocking density, pests, high or low growth, water quality parameters (temp, salinity where data available, high rain, blooms, etc.)

5. Biosecurity Plan

Under the terms of the Fish Health Authorisation which the Marine Institute has granted for each site, a biosecurity plan must be in place. This plan recognises the risks to that site and outlines how those risks can be mitigated. It is essential that the biosecurity plan is followed and updated regularly to reflect any changes in the management practices on site. All staff should be aware of the contents of the biosecurity plan. All records relevant to the biosecurity plan (i.e. cleaning, disinfection, visitors etc.) must be kept in the mandatory Shellfish Record Book.

Recommendations

- Ensure that all risks to the disease status of your site are outlined in your biosecurity plan.
- Consider each risk in turn and minimise that risk by putting appropriate mitigation measures in place.
- Regularly review and update your plan, if necessary.
- Ensure all staff are familiar with the contents of the biosecurity plan and understand the concept of disease risk
- Where possible, control access to your site. Where aquaculture related visitors pose a potential risk to your site, ensure appropriate cleaning and disinfection measures are put in place to reduce the risk to an acceptable level.

6. Marine Institute Contact Details

Fish Health Unit

Marine Institute

Rinville

Oranmore

Co. Galway

H91 R673

Telephone: 091 387200

Text Alert: 087 1847285

Email: notification@marine.ie

7. References

OIE Aquatic Code 2016

OIE Manual of Diagnostic Tests for Aquatic Diseases

Hick, P., Evans, O., Looi, R., Whittington, R. : Stability of Ostreid Herpes Virus 1 (OsHV-1) and assessment of disinfection of Seawater and oysters tissues using a Bioassay

C. W. Kaspart* & M. L. Tamplin: Effects of Temperature and Salinity on the Survival of *Vibrio vulnificus* in Seawater and Shellfish APPLIED AND ENVIRONMENTAL MICROBIOLOGY, Aug. 1993, p. 2425-2429