

Aquaculture Biosecurity Programme

An introduction to fish farm Biosecurity

The intensification of fish production provides an ideal environment in which disease-causing organisms can flourish and cause serious damage to productivity. Disease may come from any number of sources, for example viruses and bacteria. However it originates; its spreads through recognised vectors of infection. These include fish stock, staff and visitors, equipment, vehicles and transportation, other aquatic life, birds and animals, the aquatic environment and even the air itself.

Medication and vaccination have traditionally played a major role in treating diseases but it is now widely accepted that they cannot, in isolation, prevent losses due to disease. Modern farming demands a holistic approach. Unless the background challenge from disease causing organisms can be controlled, and good management practices strictly followed, medication and vaccination alone are not capable of adequately protecting fish stocks. Fish must be given an environment in which the level of infection is controlled to the point where vaccination and medication can achieve beneficial effects. Biosecurity is the key to achieving this.

Biosecurity involves the exclusion of disease-causing organisms from the environment. This is particularly important in fish production. It is achieved by the use of external and internal biosecurity barriers:

- External Barriers - blocking the spread of disease onto and off a fish farm
- Internal Barriers - blocking the spread of disease within the fish farm

The correct use and selection of disinfectants is very important and ensures that pathogen challenge is minimised, maximising the fish's natural defence against infection. This in turn will dramatically reduce incidences of disease, reducing mortality and saving you money.

There are three key factors that must be considered when selecting a disinfectant for fish farm biosecurity, these are:

- Proven Efficacy
- Environmental Impact
- Operator Safety

Proven Efficacy

Not all disinfectants are effective against the wide range of viral, bacterial and fungal disease causing organisms that affect fish production. Even disinfectants with similar chemistry can have widely different spectra of activity and effective dilution rates.

Selecting a disinfectant is therefore very important. Viral disease agents such as Infectious Anaemia Virus (ISA) are extremely persistent and difficult to destroy. The disinfectant must have independently proven efficacy against a wide range of aquaculture pathogens and be effective in low concentrations and at low temperatures.

- [Summary of efficacy data for Virkon S against aquaculture specific pathogens](#)

Environmental Impact

As well as being effective, it is important that the disinfectant causes no harm to the environment in which it is being used.

Virkon S for aquaculture is environmentally friendly. Therefore, unlike most other disinfectants where strict discharge controls are essential, use of Virkon S for aquaculture will not constrain your daily activities.

- [The environmental impact of Virkon S](#)

Operator Safety

Given the exposure limits and dangers associated with the use of some disinfectants, particularly those based on [glutaraldehyde and formaldehyde](#), consideration must be paid to operator safety. Virkon S for aquaculture has no occupational exposure limits and at a 1% in use dilution is classified as non irritant to skin and eyes.

Virkon S for aquaculture provides complete control for all aspects of fish farm biosecurity.

Biosecurity is our business...

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Application of HACCP to Fish Farm Biosecurity

Antec biosecurity products and procedures have been developed to maximise the benefits achievable through good cleaning and disinfection biosecurity practices.

The procedures have been developed to be consistent with **HACCP** principles, the seven point systematic approach to food safety adopted by livestock producers around the world. HACCP (Hazard Analysis Critical Control Points) strategies identify the areas where pathogens may enter the system, ways to eliminate them and the methods to show that the chain of production is being continuously audited to ensure that every procedure within that chain is effective.

The Principles

1. Hazard Analysis

To identify hazards, both microbiological and physical, at each step in the process through to delivery.

2. Critical Control Points (CCPs)

At CCPs action can be taken to reduce or eliminate the hazard. For example, within the fish farm there are control points at which pathogen reduction can take place as part of a biosecurity programme.

Site security	Well boat and work boat disinfection, vehicle disinfection and footdips on piers and cages
Personnel hygiene	Dive suits and equipment, hand hygiene
Equipment disinfection	Hand nets, harvesting equipment, vaccination and weighing equipment
Surface disinfection	Tables, floors, walls
Aerial disinfection	Misting or thermal fogging within buildings to control airborne pathogens
Effluent disinfection	Blood water
Rodent control	Integrated Pest Management (IPMTM) Programme
Production facilities	Broodstock, hatchery, fresh & sea water production & processing facilities

3. Critical limits

Establish acceptable limits for each hazard identified. Cleaning and disinfection in accordance with Antec biosecurity procedures will ensure that microbiological hazard meet those limits. Antec's technical team can advise in more detail in this important area.

4. Monitoring

Observation and measurement of cleaning and disinfecting to ensure the critical limits are met at each step.

Antec Dilution Test Kits can be used to ensure products are used at the correct dilution. Antec Bacteriological Evaluation Kits can be used to determine effectiveness of surface disinfection.

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5. **Correction**

Action must be taken if the critical limits are not met at each step. A review of the application procedure should be made to ensure that it is in accordance with Antec biosecurity guidelines.

6. **Recording**

A complete set of records is important for legal action and may form part of a current Quality Scheme e.g. BS EN ISO 9002. Records must be kept to show that biosecurity procedures are in place and are being implemented correctly. Records should be kept of products used, critical limits, cleaning schedules and any corrective action taken.

7. **Verification**

Tests and procedures to ensure that the HACCP systems is working properly. The audit is often external and may include verification of dilutions rates, applications rates and bacteriological tests.

Biosecurity plays an important role throughout every stage of the life cycle of a fish, from hatching through to processing.

