

AQUATIC ANIMAL HEALTH STANDARDS COMMISSION

SEPTEMBER 2011 REPORT

CHAPTER 6.5.

**DEVELOPMENT AND HARMONISATION OF
NATIONAL ANTIMICROBIAL RESISTANCE
SURVEILLANCE AND MONITORING PROGRAMMES
FOR AQUATIC ANIMALS**

Article 6.5.1.

Purpose

This chapter provides criteria relevant to aquatic animals, products of aquatic origin intended for human consumption and their rearing environment for:

1. the development of national antimicrobial resistance surveillance and monitoring programmes and
2. the harmonisation of existing national antimicrobial resistance surveillance and monitoring programmes.

Article 6.5.2.

Objective of surveillance and monitoring programmes

Countries should conduct active antimicrobial resistance surveillance and monitoring programs.

Surveillance and monitoring of antimicrobial resistance is necessary to:

1. establish baseline data on the prevalence of antimicrobial resistant microorganisms and determinants;
2. collect information on antimicrobial resistance trends in relevant micro organisms;
3. explore the potential relationship between antimicrobial resistance in aquatic animal micro organisms and the use of antimicrobial agents;
4. detect the emergence of antimicrobial resistance mechanisms;
5. conduct risk analyses as relevant to aquatic animal and human health;
6. provide recommendations on human health and aquatic animal health policies and programmes.
7. provide information to facilitate prudent use, including guidance for professionals prescribing the use of antimicrobial agents in aquatic animals;

Cooperation at a regional level between Countries conducting antimicrobial resistance surveillance should be encouraged.

The findings of surveillance and monitoring programmes should be shared at the regional and international level to maximise understanding of the global risks to human and animal health. The publication of these data is important to ensure transparency and to allow all interested parties to assess trends, to perform risk assessments and for risk communication purposes.

Annex X (contd)

Article 6.5.3.

Design of surveillance and monitoring programmes

Surveillance of antimicrobial resistance at targeted intervals or ongoing monitoring of the prevalence of resistance in micro organisms from animals, food, environment and humans constitutes a critical part of animal health and public health strategies aimed at limiting the spread of antimicrobial resistance and optimising the choice of antimicrobial agents used in therapy.

For aquaculture it is important to conduct surveillance and monitoring of microorganisms that infect aquatic animal and micro organisms present on food derived from aquatic animals. It may be also important to consider surveillance and monitoring of micro organisms that may potentially serve as a reservoir of resistance determinants in the environment.

Article 6.5.4.

Design of surveillance and monitoring programmes for micro organisms that infect aquatic animals

1. Selection of micro organisms

Information on the occurrence of antimicrobial resistance in microorganisms that infect aquatic animals should be derived from regular monitoring of isolates obtained from diagnostic laboratories. These isolates should have been identified as primary causal agents of significant disease epizootics in aquatic animals.

It is important that monitoring programs focus on microorganisms that are associated with the commonly encountered infections of the major aquatic species farmed in the region / local growing area.

Selection should be designed to minimise bias resulting from overrepresentation of isolates obtained from severe epizootics or epizootics associated with therapeutic failures.

Microorganisms belonging to a specific species or group may be selected for intensive study in order to provide information on a particular problem.

2. Methods used to analyse microorganism susceptibility to antimicrobial agents

Participating laboratories may perform disc diffusion, minimum inhibitory concentration or other susceptibility tests to monitor frequencies of resistance. Protocols that have been standardised internationally and validated for application to the study of aquatic microorganisms should always be used.

3. Requirements for laboratories involved in monitoring resistance

Laboratories involved in national or regional monitoring of antimicrobial resistance should be of sufficient capability and have relevant expertise to comply with all the quality control requirements of

the standardised test protocols. They should also be capable of participating in all necessary inter-laboratory calibration and on-going validation studies.

4. Choice of antimicrobial agents

Representatives of all major classes of antimicrobial agents used to treat disease in aquatic animal species should be included in susceptibility testing programmes.

5. Reporting of results

The results of monitoring and surveillance programmes, including susceptibility data, should be published and made available for use by relevant stakeholders. Both raw quantitative data and the epidemiological cut-off values or clinical breakpoints used to make interpretations of the data should always be reported.

Article 6.5.5.

Design of surveillance and monitoring programmes for microorganisms in or on food derived from aquatic animals

For details of the sampling protocols and analytical procedures required for *surveillance* and monitoring programs for antimicrobial resistance in microorganisms present in products of aquatic animal origin intended for human consumption, the relevant section of the Terrestrial Animal Health Code should be consulted.

It is important to note that the word ‘commensal’ as used in the Terrestrial Animal Health Code has less relevance due to the transient nature of the intestinal microflora of aquatic animals. Therefore commensal bacteria should not be included in surveillance and monitoring programs.

When designing a sampling program it is important to consider that contamination of aquatic animal products with resistant microorganisms that are capable of infecting humans may arise from sources other than the aquatic animal. All sources of contamination should be taken into account, for example entry of raw manure into the aquatic environment.

The number of zoonotic microorganisms of aquatic animals is much less than that found in terrestrial animals. However the following species should be included, as a minimum, in a monitoring or surveillance programme:

- a) *Salmonella* spp
- b) *Vibrio parahaemolyticus*
- c) *Listeria monocytogenes*.

Article 6.5.6.

Surveillance and monitoring for antimicrobial resistance in microorganisms present in aquatic environment

The development of a reservoir of resistance determinants in microorganisms in the aquatic environment has been identified as a potential risk arising from the use of antimicrobial agents in aquaculture. The objective of a surveillance and monitoring programme for these resistance determinants is to generate the data needed to conduct risk analysis.

The development and implementation of these programs is significantly challenged by the complexity of the biological pathways, the lack of culture and susceptibility testing methods, and the diversity of aquaculture operations.

These programs should focus on:

- a) resistance determinants rather than on resistant microorganisms;
 - b) the use of quantitative molecular methods rather than traditional culture and susceptibility testing methods;
 - c) generating baseline data on the prevalence of resistance determinants (a) prior to exposure to the outputs of the aquaculture operation and (b) following exposure to the outputs of the aquaculture operation;
 - d) investigating a possible relationship between the emergence and persistence of resistance determinants and the use of antimicrobial agents.
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