Approaches to managing aquatic animal health in Australia

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Summary
Despite a rapid and continuous expansion in aquaculture industries, Australia has not experienced significant disease emergencies in farmed aquatic animal populations. However, recent events in relation to wild, farmed, native and introduced aquatic animals have provided warning signals. The development of a national response mechanism for fisheries and aquaculture emergencies became a high priority following the pilchard mortality outbreak in 1995. In terms of more general policy, a special Task Force has provided a framework for managing exotic pests, weeds and diseases and identifying key principles and issues. This Task Force also recommended closer consultation between relevant industry organisations and government agencies.

The authors describe the framework of the comprehensive five-year national strategic plan for aquatic animal health ('AQUAPLAN') developed by Australia, and the aquatic animal disease veterinary emergency plan developed within this framework ('AQUAVETPLAN').

Keywords

Introduction
Despite a rapid and continuous growth in aquaculture industries (1, 2), Australia has not experienced significant disease emergencies in farmed aquatic animal populations. However, recent events in wild, farmed, native and introduced aquatic animals have offered several warning signals, as follows:

- the presence of goldfish ulcer disease (atypical Aeromonas salmonicida), introduced with goldfish (Carassius auratus) from Japan which spread to cultured goldfish populations in Victoria, Australia, in the 1970s. This disease displays in vitro pathogenicity to and to native fish, such as silver perch

- epidemic haemato poetic necrosis, found in introduced, wild juvenile redfin perch (Perca fluviatilis) in Victoria in 1986; since then also found in southern New South Wales and South Australia. This is an opportunistic pathogen for cultured rainbow trout (Oncorhynchus mykiss)

- the discovery of Bonamia species in cultured native flat oysters (Ostrea angasi) in Victoria in 1991; since then also demonstrated in tissue sections from oysters sampled in 1986, and found in South Australia, Tasmania and Western Australia

- significant mortality in farmed prawns (Penaeus monodon) in Queensland from 1994 to 1996

- mass mortality in wild pilchards (Sardinops sagax [neopilchardus]) off the southern coasts of Australia in 1995 and 1998.

Except for the pilchard mortality events, none of the above incidents reached epizootic proportions. The 1995 pilchard
mortality incident demonstrated a number of deficiencies in both national and State preparedness and response arrangements. Problems encountered included uncertainty about jurisdictional responsibility, approaches to the media and issues of compensation. In the absence of specific national emergency preparedness arrangements for fish, the Commonwealth used the existing mechanism for the management of exotic animal diseases: the Consultative Committee on Emergency Animal Diseases (CCEAD). Towards the end of 1998, Australia experienced another pilchard mortality event, similar to the 1995 incident. The 1998 event was immediately placed under the CCEAD mechanism; the lessons learnt in the 1995 incident have enabled Australia to take a much more structured, co-ordinated and efficient approach to managing the incursion.

In November 1995, the Standing Committee on Fisheries and Aquaculture (SCFA), comprising representatives of both State and Territories Governments, reported to the Ministerial Council on Forestry, Fisheries and Aquaculture (MCFFA) that priority should be given to developing a national response programme for fisheries and aquaculture emergencies.

In terms of a more general policy framework, in 1996, the Standing Committee on Agriculture and Resource Management (SCARM) (website: http://www.dpie.gov.au/dpie/armcanz/scarm.html), under the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (website: http://www.dpie.gov.au/dpie/armcanz/), established a special Task Force on Managing Incursions of Exotic Pests, Weeds and Diseases. The main objectives of the Task Force were as follows:

- to conduct an evaluation of current arrangements for incursion management across all three primary industry sectors - animals, plants and fish
- to investigate the feasibility of a generic approach to incursion management across all three sectors
- to examine the core principles and key issues of incursion management, including the roles and responsibilities of stakeholders and aspects of definition
- to explore funding options for incursion management, including cost-sharing agreements.

The Task Force was chaired by the Australian Chief Veterinary Officer (CVO), Dr Gardner Murray. It reported back to the SCARM with a comprehensive report in February 1997 (7), recommending a ‘common approach to incursion management across all primary production sectors’. The Task Force provided a template for incursion management, identifying key principles and issues and recommending further development of this management model in close consultation with relevant industry organisations and government agencies. In specific regard to the fish sector, the Task Force Fish Sub-Committee recommended that implementation of the incursion management programme be delegated to the Fish Health Co-ordinating Group (FHCG) (see below).

Background to the first contingency planning approaches

In July 1995, the FHCG was established under SCARM to address national fish health matters, using a task force approach, and to draw on the resources of both SCARM and SCFA. The FHCG was chaired by the Chief of the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Division of Animal Health, Dr Mike Rickard.

The terms of reference for FHCG included the following:
- advancing the development of contingency plans to manage disease emergencies
- developing standard diagnostic techniques
- developing a national list of notifiable diseases of aquatic animals
- making recommendations for a national surveillance and monitoring programme.

The previous SCARM Sub-Committee had had State and Territory membership. However, FHCG membership was expanded to include representatives from industries and various groups within the then Commonwealth Department of Primary Industries and Energy (DPIE) – now Department of Agriculture, Fisheries and Forestry Australia (DAFF) (website: http://www.dpie.gov.au/dpie).

The first task of the FHCG was to appoint a consultant, funded by the DPIE, to make recommendations on the national management of incursions of aquatic animal diseases and aquatic pests. In 1995, this report, called Managing the National Response to Fisheries and Aquaculture Emergencies (6) (the ‘Jones Report’), was presented to the SCFA for consideration. The Jones Report advised on the need for a re-assessment of directions and priorities in co-ordinating national responses to aquatic pest emergencies. It further advised on the development of a coherent approach in planning for appropriate disease control programmes at national and State levels. In May 1996, the SCARM considered a more broadly focused paper, submitted by the DPIE, which led to the establishment of the Task Force on Managing Incursions and its final report in 1997, mentioned previously (see above). In mid-1996, the SCFA considered the recommendations of the Jones Report and decided that the newly established Task Force on Managing Incursions, with its Fish Sub-Committee, was the most appropriate body to oversee the development of a national programme to respond to aquatic pest incursions.
To address the issues raised, this Fish Sub-Committee organised a workshop on contingency planning for aquatic animal disease emergencies in August 1996. This workshop was attended by a wide range of participants, as follows:

- representatives of commercial and recreational fishing
- representatives of aquaculture industries
- delegates from the Commonwealth DPIE
- delegates from CSIRO
- delegates from State and Territory Government departments
- representatives from the Cooperative Research Centre (CRC) for Aquaculture Ltd (website: http://www.dist.gov.au/crc)
- representatives from other bodies and institutions.

Recommendations from this workshop formed the basis for further progress on all tasks given to FHCG. In relation to emergency planning, in particular, FHCG advanced the establishment of a written contingency plan, later incorporated into 'AQUAVETPLAN' (see below).

**Strategic planning for aquatic animal health – AQUAPLAN**

**AQUAPLAN – the background**

The Government of Australia has a strong commitment to aquatic animal health to ensure the effective and sustainable development and profitability of the aquatic animal industries. In this context, the prevention and management of diseases are of paramount importance. Like most countries, however, Australia did not, in the past, have a policy framework or a national strategic approach to aquatic animal health.

Over the last few years, several comprehensive reviews have been formally tabled within Australia. These reviews critically assess and make recommendations on the following:

- a national response to fisheries and aquaculture emergencies (the Jones Report, mentioned above)
- quarantine in Australia, including aquatic animal quarantine (8, 9)
- the importation of fish and fish products (5)
- the management of incursions of pests, weeds and diseases (the Report of the Task Force on Managing Incursions, see above).

In 1997, following an Australian Cabinet decision relating to these various reports, the Federal Government allocated AUS$6.7 million to the then Commonwealth DPIE (now DAFF) over four years to implement the recommendations of these reports and to develop a comprehensive aquatic animal health plan for Australia. Within the DPIE, the Fisheries and Aquaculture Branch and the Office of the Commonwealth CVO co-ordinated the drafting of such a plan – 'AQUAPLAN' – for a five-year term, from 1998 to 2003.

A ministerially appointed Australian Fish Health Management Committee (FHMC) convened a meeting of Commonwealth and State/Territory delegates and key industry representatives in April 1998, to obtain the views of a broader spectrum of stakeholders on this draft plan. In particular, the Committee sought agreement on the main objectives of the plan, and a critical assessment of whether those objectives would be met by the draft strategy. Members of the FHMC include representatives from the Federal, States and Territories Governments, Animal Health, CSIRO and the Australian fisheries and aquaculture industries, as follows:

- the Australian Seafood Industry Council
- the Australian Aquaculture Forum
- Recfish Australia (the national body which represents recreational and sport fishing in Australia).

The draft AQUAPLAN was revised and subsequently presented to fisheries and aquaculture industry bodies, as well as to the two relevant Ministerial Councils, MCFFA and ARMCANZ, for endorsement.

**Structure of AQUAPLAN**

There are numerous issues which should be addressed by a national aquatic animal health plan, and there are various ways in which these issues may be grouped. Such issues do not stand alone; on the contrary, they are closely interrelated. Thus, AQUAPLAN may be thought of as a network, which consists of many different issues, connected by a web-like structure of connections. For practicality, these issues have been grouped into larger programmes, with a manageable number of projects included in each.

AQUAPLAN consists of eight key strategic programmes, which provide the necessary framework to develop and implement comprehensive operational plans for aquatic animal health issues. Each programme consists of specific projects and project components, which have been identified as the most effective means of meeting the objectives of that particular programme. Leaders have been selected for individual projects and components, and detailed business plans have been written. The eight programmes of AQUAPLAN, the national strategic plan for aquatic animal health in Australia between 1998 and 2000, are as follows:

a) international links
b) quarantine
c) surveillance, monitoring and reporting
d) preparedness and response arrangements
e) awareness
f) research and development

g) legislation, policies and jurisdiction

h) resources and funding.

Review and evaluation of progress

The success of AQUAPLAN depends upon a sustained sense of collective responsibility and a collaborative approach at all levels of government and industry. The realisation of many projects will rely heavily on the leadership and contribution of the private sector. A formal review and evaluation process, developed by the FHMC, has been implemented to ensure the timely delivery of project outputs, and the continuous fine-tuning of objectives, as well as of the means to meet them.

AQUAPLAN programme 4 – preparedness and response

Aquatic animal disease emergency planning is covered under one of the eight AQUAPLAN programmes. The objectives of this particular programme, programme 4, are as follows:

- to develop effective institutional arrangements for managing emergency aquatic animal diseases in Australia

- to develop a series of manuals and procedures which outline appropriate methods and protocols for managing emergency aquatic disease outbreaks in Australia (AQUAVETPLAN), based on the existing AUSVETPLAN.

Institutional arrangements for aquatic animal disease emergencies

The development of effective institutional arrangements to manage disease emergencies in the aquatic sector is a high priority. One of the major differences from the well-developed procedures in the terrestrial animal sector in Australia is the involvement of two ministerial portfolios (fisheries and agriculture), rather than one. Consequently, questions as to which Ministry should have jurisdiction over various areas, rather than legislative issues, must be resolved as a matter of priority. States and Territories must develop their own arrangements to achieve a nationally agreed outcome.

The Fish Sub-Committee of the SCARM Task Force on Managing Incursions supported the incorporation of decision-making and organisational arrangements for aquatic animal diseases into the existing CCEAD structure for land or terrestrial animals. Aquatic animal disease emergencies will be managed under CCEAD procedures, customised to the specific situation. The responsibility for terrestrial animal disease emergencies lies within the agricultural/veterinary portfolios, whereas the aquatic animal sectors must also involve the fisheries/aquaculture portfolios. Thus, not only the State or Territory CVOs but also the Fisheries Managers or Directors of Fisheries (DFs) will be involved in the response structure. CCEAD activities relating to aquatic animal disease emergencies will be chaired by the Commonwealth CVO, with secretariat support provided by the Director of Aquaculture of the DAFF Fisheries and Aquaculture Branch. The primary responsibility will lie with the Commonwealth. Setting precise terms of reference and operating rules, especially in relation to the flow of communication, and conducting simulation exercises are high priorities.

Co-ordinated national response plans

Part of a strategic approach to aquatic animal health emergencies is the formulation of a well-structured, co-ordinated national response plan for the effective control and eradication of certain diseases. Such a response plan needs to be fully understood and agreed upon by all the parties involved.

AUSVETPLAN

In terms of terrestrial animals, a well-developed Australian Veterinary Emergency Plan (AUSVETPLAN) already exists (3). AUSVETPLAN is the national co-ordinated response plan for the control and eradication of exotic animal diseases in Australia. The plan comprises a series of technical response plans, which describe the proposed approach to an exotic disease incursion into Australia. The documents provide guidance based on the following:

- sound analysis
- well co-ordinated policies
- disease control strategies
- effective implementation of these strategies
- effective co-ordination and emergency management.

These procedures are described in a set of manuals which were approved in their first edition in February 1991, considerably revised in 1995 and approved in their second edition in January 1996. AUSVETPLAN documents comprise the following:

- a summary
- disease strategies for currently 23 diseases
- manuals of operating procedures
- enterprise manuals, covering specific business enterprises
- management manuals
- agency support plans
- training resources
- diagnostic resources.

The Appendix provides information on the national arrangements regarding policy and strategies, emergency response structures and the Commonwealth/States cost-sharing agreement.

AQUAVETPLAN

The mandate given to the DAFF to draft a similar plan for aquatic animal disease emergencies proposed that the structure should be based on the existing terrestrial animal health and emergency response procedures, to avoid duplication and to use existing arrangements, wherever possible. Therefore, it was decided to produce the Aquatic Animal Diseases Veterinary Emergency Plan.
by adopting AUSVETPLAN wherever possible, and incorporating only the specific components relating to aquatic animals as new material.

Control Centre Manual

The first component of AQUAVETPLAN to be completed was a Control Centre Manual, which closely resembles the terrestrial animal equivalent. This manual provides information on management structures. It also contains a scheme for the effective flow of information, at national, State or Territory and district levels, when managing an aquatic animal disease emergency. It describes the operations of control centres, providing principles for the chain of responsibility, the functions of different sections and role descriptions for key personnel. The manual is divided into two parts, as follows:

- Part 1 covers establishing, managing and organising control centres
- Part 2 provides detailed job descriptions, listing the skills, experience and/or qualifications required for people working in these centres.

This procedure is identical to that employed for terrestrial animal disease emergencies. There are four phases in the response to a disease emergency, as follows:

- the investigation phase
- the alert phase
- the operational phase
- the stand-down phase.

When an aquatic disease emergency is confirmed, the operational phase of the response is activated, and the State CVO and/or DF establishes the control centres. These control centres are set important tasks, as follows.

The local Disease Control Centre is:

- a) established at the site of the disease emergency to co-ordinate local activities
- b) led by a Controller (appointed by the CVO/DF) who manages the following:
  - organises the location, equipment and layout
  - directs operational functions
  - manages technical functions
  - co-ordinates activities with the State Emergency Services
- c) determines the source and extent of the outbreak
- d) controls or eradicates the outbreak.

The State Disease Control Headquarters:

- a) are established at a remote location to co-ordinate activities throughout the State
- b) liaise with and co-ordinate the flow of information to the following:
  - the local Disease Control Centre
  - CCEAD
  - other State or Territory authorities
- c) make policy and strategy decisions
- d) deal with the media and public relations
- e) oversee financial arrangements.

The Control Centre Manual describes in detail the roles of various personnel during the different phases of the response to a disease emergency. These personnel include the following:

- field officers
- regional emergency managers
- fish health officers
- the CVOs
- the DF
- the diagnostic team.

Enterprise Manual

Under the auspices of the FHCG, the FRDC funded the writing of an Enterprise Manual (4). This Manual deals with specific business enterprises, such as hatcheries or net cage farms, which present difficult economic or disease eradication issues, or are epizootiologically important in the spread and impact of the disease. This Manual was produced for State and Territory authorities, industry groups, farmers and Commonwealth Government officials.

There are numerous options for categorising the very different types of fisheries and aquaculture enterprises, for example, by aquatic animal species or species groups being managed (salmon, tuna, prawns, molluscs, ornamental fish), or by water temperature (enterprises in temperate zones, in subtropical zones and in tropical zones). However, as the Manual is intended to provide guidance in disease emergencies, categorisation was based on two parameters – the ability to exert control over water and to exert control over the animals. Four large categories were thus created, as follows:

- open systems
- semi-open systems
- semi-closed systems
- closed systems.

Table I provides additional details on the factors used to describe these systems, together with some examples of enterprises which fall into these broader categories.

Drafts for the Enterprise Manual were developed at two workshops in August and October 1997, with contributions from a wide range of government and industry representatives. Industry contributions were especially valuable for the 'industry sector information' section ((574,879),(995,995)). Groups with members from the Commonwealth,
Table I
AQUAVETPLAN – Enterprise Manual: the four categories of systems employed in business enterprises of the aquaculture industry

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State or Territory Governments and the fisheries and aquaculture industry were established to write guidelines for each of the four systems (i.e. open, semi-open, semi-closed and closed). At the end of 1998, finalisation of the Enterprise Manual is anticipated for early 1999; it is understood that the contents will be updated as necessary.

The Manual consists of three principal sections, as follows:

a) Section A: definitions

b) Section B: industry sector information (further divided into four sub-sections: open systems, semi-open systems, semi-closed systems and closed systems). This section comprises the following areas:

- the introduction of different systems (e.g. net culture)
- aquaculture practices (e.g. source of stock, harvest)
- premises and equipment
- system inputs (e.g. water, animals, feed)
- system outputs (e.g. waste-water, animals, wastes)
- the industries and statutory bodies involved
- legislation and codes of practice
- issues of occupational health

c) Section C: disease emergency response options

- general considerations
- specific considerations relating to the four systems (open, semi-open, semi-closed, closed).

In brief, Section B describes, for each of the four different systems, information which is relevant when attempting to manage an emergency disease situation. This section is not intended to provide textbook-like, detailed descriptions of these operations. Rather, it contains information which is needed to decide upon a particular response to each specific case (Section C). Thus, Section B describes – in a generic way – the source of inflowing water as well as the destination of effluents, the origin of stock, the extent of staff and visitor movements that must be expected, harvest practices, etc. Naturally, these descriptions can give only an average picture of how such operations are managed. It is expected that individual operators will develop their own specific documentation. Close co-operation is needed to raise awareness in the aquaculture industry of developing such farm-specific contingency plans. Only these specific plans can provide the information necessary to decide on an emergency response in a specific emergency situation.

Section C draws on the information provided in Section B. The factors which need to be considered in an emergency response are listed and explained. Various response options are described, ranging from ‘doing nothing’ to the destruction of all stock. Factors to consider and possible response options are described in a general manner at first, and then in more detail for each of the four systems discussed. Specific details are shown below:

a) Factors to consider in assessing the response to a disease emergency are as follows:

- the stage of the outbreak
- the epizootiology, biology and stability of the disease agent
- features specific to the site of the outbreak
- management practices used in this system
- the proximity of the outbreak site to other aquaculture enterprises and to natural environments
- the stage of development of the affected stock
- the effectiveness of any treatment, vaccination or control measure
- the potential consequences of the disease or of any disease control measures to the industry and to trade in general
- the costs of disease control measures.
b) Response options are as follows:
- measures requiring no disruption to regular operations
- measures requiring some disruption to regular operations, such as increased vigilance, movement control and treatment measures
- measures requiring major disruption to regular operations, such as isolation of the premises or farm, relocation of stock, emergency harvest or destruction of stock.

Further AQUAVETPLAN components
Some components of AQUAVETPLAN, such as the standard operating procedures, will be adopted largely from AUSVETPLAN, whereas others must be developed specifically for aquatic animals. Given the limited resources available, priorities are being decided in a strongly consultative manner, with the industry leading the process.

Currently, work has begun on writing 'Disease strategies', which will be the authoritative reference on control and eradication policies for aquatic animal disease emergencies in Australia. These strategies will provide information on the nature of the disease, the principles of control and the control policies to be employed. Each strategy will provide sufficient information to allow the authorities to make informed decisions on what policies and procedures should be used to control an outbreak of that particular disease in Australia. Diseases will be placed in order of priority, with significant industry consultation. The National List of Reportable Diseases of Aquatic Animals contains those diseases which have been identified as being of national concern to Australia.

General awareness and planning
The AQUAVETPLAN and CCEAD provide an operational and structural framework for managing aquatic animal disease emergencies. However, both the general public and industry sectors need to raise their awareness of disease emergencies to ensure that these frameworks operate effectively.

Aquaculture is an emerging industry in Australia, so there is not yet a tradition of training highly qualified professionals to deal with aquatic animal health issues. Those trained professionals in the field are there generally because of personal interest. It is a goal in Australia to embed fish health training into veterinary courses and to provide opportunities for trained professionals to apply their knowledge. Development of self-teaching interactive media courses could be of assistance in developing veterinary skills in a cost-effective manner.

An entire AQUAPLAN programme is dedicated to 'Awareness', with projects being identified inter alia in 'Public awareness and communication' and 'Education and training'. The latter should occur on a tertiary education level and include veterinary training. Various industry sectors have already included recommendations on managing disease in their codes of practice. Recfish Australia (which represents recreational and sport fishing) asks its members to 'report all stranded or dead aquatic animals and protected reptiles' as a way of protecting the environment, in the National Code of Practice for Recreational and Sport Fishing published in February 1998 (10). The Pet Industry Joint Advisory Council of Australia asks members to co-operate in the 'prevention of possible epidemic infestations of disease and parasitic organisms among aquatic animals', and lists specific instructions of how to implement this goal in its Code of Practice for Aquarium Operations. A Code of Conduct for Australian Aquaculture was promulgated by the Australian Aquaculture Forum in 1998, and is supported by the State and Territory Aquaculture Managers. This Code specifically asks members to 'support the development of appropriate contingency plans to deal with unplanned releases of aquaculture species/stock, or the spread of diseases, parasites and other pathogens', and to protect the environment by other means, such as immediate reporting of any mass mortality, and containment of diseased or infected stock.

Finally, in regard to business enterprises, disease must be included as a necessary factor in any business plan. Among the better-organised industry sectors, it is understood that conscientious record-keeping is a prerequisite for any business, and is often also a legal requirement. Aquaculture enterprises, in particular, should diligently plan their establishment, considering the provision of areas for both the disposal of diseased stock and the containment of water from infected ponds for treatment prior to disposal. The lay-out of the enterprise should be known to all staff, and crucial control points should be identified in advance (e.g. pumps, weirs). Simple provisions, such as a regularly updated list of emergency contact telephone numbers, can save a lot of time in emergency situations. Enterprises which draw heavily on seasonal staff should ensure that all participants know about these provisions and understand their role in an emergency. As part of the AQUAPLAN 'Awareness' programme, these issues are addressed at meetings of farmers, and in simulation exercises, to test the lines of communication.

Resources and funding
One of the key elements in a successful aquatic animal health plan in general, and in emergency planning in particular, is to obtain industry and governmental financial support to offset the costs of the programme. Resources are needed in cash and 'in kind' (that is, physical or material assistance). From an Australian perspective, there are likely to be enough people and laboratories in aggregate to manage developments in aquatic animal health at this point in time. However, it is quite clear that expert resources will be required in the near future to support a rapidly growing industry. To date, the
The Commonwealth Government has contributed AUS$6.7 million to the DAFF over a four-year period, to implement major recommendations arising from the formally accepted reviews mentioned above. This funding will allow for the following:

- the development of AQUAPLAN and supporting documentation
- the establishment of surveillance and monitoring programmes
- the provision of promotion and training activities.

The challenge will be to market the plan effectively and to encourage financial support from industry to supplement government funding for the continuing maintenance of the programme beyond this fourth year. AQUAPLAN will therefore be examining these requirements, and exploring the need to re-allocate current resources into priority areas, as follows:

- research and development
- surveillance and monitoring
- education and training.

All these should be conducted in partnership with industry.

From a funding perspective, the management of emergencies is complex. This, in large part, reflects the fact that governments will no longer pay the full costs when such emergencies arise. Uncertainties arise during emergencies, which can delay an effective response until funding matters are resolved. Unless the industry has some certainty about funding support, including compensation, there may be little incentive to report disease. Funding principles include the following:

- agreement on which diseases will qualify for paid compensation
- agreement on which activities the money will be available to fund (e.g. the cost of eradication, the cost of restocking)
- agreement on a fund-raising procedure (e.g. levies, cost-sharing between the government and private sector)
- encouragement of early reporting of disease
- the principle that those affected by a disease for which compensation is provided should be neither better nor worse off as a result of receiving compensation.

In Australia, the issue of shared costing arrangements has been raised. In the terrestrial animal sector, cost-sharing between the Commonwealth and State/Territory Governments is applied when reimbursing costs incurred in the control of a small number of exotic diseases. Contributions to the fund are calculated according to a specific formula, taking into account the number of susceptible livestock and the gross value of production, as shown in the Appendix (3). However, the current approach is being re-examined. It is now recognised by governments that there are efficiency and equity gains if those who benefit from such programmes also contribute to their cost. Therefore, governments and industries are examining a different approach to the costs of emergency management, depending on the nature of the disease. Diseases – not only exotic diseases – may be categorised by determining the primary and secondary beneficiaries of their control. Where industries are the primary beneficiaries of disease control, it should be reflected in their level of contributions.

The situation in the aquatic animal sector is very complex for several reasons, as follows:

- both aquaculture and fisheries have had the luxury of being relatively free from disease to date
- aquaculture is a new and emerging industry with many small farms
- industry sectors, with the exception of Atlantic salmon (Salmo salar) and Southern bluefin tuna (Thunnus maccoyii) farming, have been prepared to suffer individually the cost of disease outbreaks and management, to the extent that they do not regularly buy insurance cover
- not all States and Territories include aquatic animals in their definition of livestock. Inclusion in this definition allows existing (terrestrial) animal disease control arrangements to apply to aquatic animals
- effective aquatic animal disease emergency plans must involve both the wild catch fishing sector and the recreational sector
- there is reluctance within the fisheries sectors to contribute to a compensation fund involving – or possibly focusing on – aquaculture
- aquatic species do not occur homogeneously in Australia, e.g. Southern bluefin tuna is farmed in South Australia, Atlantic salmon is farmed predominantly in Tasmania, and prawns largely in Queensland.

There is an urgent need for intensive consultation among industries and governments to advance the issue of compensation. Under the AQUAPLAN programme, 'Resources and funding', closer examination of whether the existing or future funding structures being explored in regard to terrestrial animals should also be applied to the aquatic animal industry is a high-priority project.

Conclusions

Diligent planning for aquatic animal disease emergencies is a prerequisite for effective management of such emergencies. Different countries will have different approaches to this planning. In Australia, emergency planning is a co-operative, multidisciplinary approach. No single discipline – be it veterinary science, epizootiology or biology – can claim emergency planning as an exclusive domain.
A template for managing the incursion of exotic disease, and identifying generic core principles and key issues, has been developed for all primary production sectors. Further development and refinement of this model to meet the needs of situations specific to aquatic animals has begun, in close consultation with relevant industry organisations and government agencies. The first ‘tangible’ achievements are the various manuals produced for the comprehensive Aquatic Animal Disease Veterinary Emergency Plan (AQUAVETPLAN). The biggest remaining challenge for industry and for governments is to advance the issues of sustained funding and resources, and compensation for disease emergencies.

Comment gérer la santé des animaux aquatiques : l’approche de l’Australie

E.-M. Bernoth, G. Murray, M.D. Rickard & G. Hurry

Résumé
En Australie, le développement rapide et continu de l’aquaculture ne s’est pas traduit par l’apparition de situations d’urgence sanitaire majeures dans les élevages d’animaux aquatiques. Toutefois, des incidents récents liés à des animaux aquatiques (qu’il s’agisse d’espèces sauvages, d’élevage, locales ou exotiques) ont constitué autant de signaux d’alerte. La mise en place d’un système national de traitement des situations d’urgence dans les pêcheries et l’aquaculture est devenue une priorité absolue après l’épidémie qui s’est abattue sur les populations de sardines en 1995. Dans une approche plus générale, un groupe d’intervention a été constitué pour organiser la gestion des espèces nuisibles, des algues toxiques et des maladies exotiques et pour définir les principes et les problèmes essentiels. Ce groupe a également recommandé une collaboration plus étroite entre les associations de professionnels et les pouvoirs publics.

Les auteurs décrivent le cadre du plan quinquennal de stratégie globale pour la santé des animaux aquatiques (AQUAPLAN) mis en place en Australie, ainsi que le plan d’urgence vétérinaire pour les maladies des animaux aquatiques (AQUAVETPLAN), qui s’inscrit dans le précédent.

Mots-clés

Enfoque de la gestión de la sanidad de animales acuáticos en Australia

E.-M. Bernoth, G. Murray, M.D. Rickard & G. Hurry

Resumen
En Australia, pese al rápido y continuo desarrollo que ha experimentado el sector de la acuicultura, no se han producido emergencias sanitarias de importancia entre las poblaciones de animales acuáticos de vivero. No obstante, ciertos episodios recientes relacionados con animales acuáticos, ya fueran
salvajes o de vivero, nativos o exóticos, deben interpretarse como señales de advertencia. Tras el brote de mortalidad de sardinas de 1995, la elaboración de un sistema nacional de respuesta a las emergencias sanitarias en pesquerías o centros de acuicultura se convirtió en un objetivo de la mayor importancia. En cuanto a medidas de orden más general, un grupo de trabajo especial elaboró una serie de orientaciones para gestionar plagas, algas tóxicas y enfermedades de origen exótico y determinar los principios y problemas fundamentales en ese terreno. Dicho grupo de trabajo recomendó también una colaboración más estrecha entre las organizaciones profesionales del ramo y los organismos públicos.

Los autores describen las líneas generales del amplio plan estratégico nacional sobre sanidad de los animales acuáticos que, con vigencia quinquenal, se ha elaborado en Australia (AQUAPLAN), así como el plan de emergencia veterinaria para enfermedades de animales acuáticos encuadrado en el anterior (AQUAVETPLAN).

Palabras clave

Appendix

AUSVETPLAN
National arrangements for terrestrial animal diseases [excerpt]

Policy and strategies

The fundamental aim of national exotic animal disease control policy is to eradicate any introduced disease while this is considered to be reasonably feasible. The principle option is eradication by stamping-out where this is applicable and is considered to be cost-effective. This option involves slaughter and sanitary disposal of all infected and in-contact animals. [...]

Emergency response structure

When an exotic disease is suspected or occurs, various stages of activation may occur. These are described briefly below:

- Investigation Phase exists when a report of a possible exotic disease is being investigated by animal health authorities.
- Alert Phase exists when a high probability that an exotic disease is present or is confirmed in another State.
- Operational Phase exists when the CVO determines that there is an animal disease emergency in the State, and operations to contain, control or eradicate the disease are implemented.
- Stand-down Phase exists when the CVO determines that there is no longer an animal disease emergency and operations are wound down.

Actions to be implemented during these phases are described in the Control Centres Management Manual [...]

Commonwealth/States cost-sharing agreement

Under the Commonwealth/States cost-sharing agreement for the eradication of certain exotic animal diseases, the total cost of eradication is borne by the Commonwealth (50%) and the States/Territories (50%). Each State/Territory pays a proportion fixed according to a formula established for each of the 12 diseases covered. The cost-sharing agreement applies only while CCEAD advises ARMCANZ that 'eradication is considered to be reasonably possible'. [...]

Palabras clave
References


