



# Australian and New Zealand College of Veterinary Scientists

## Membership Examination

June 2021

## Medicine and Management of Aquaculture Species

### Paper 1

Perusal time: **Fifteen (15)** minutes

Time allowed: **Two (2)** hours after perusal

Answer **ALL FOUR (4)** questions

Answer **FOUR (4)** questions, each worth 30 marks total 120 marks

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# Paper 1: Medicine and Management of Aquaculture Species

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Answer all four (4) questions

1. You are a mobile, fully equipped fish vet, and a client asks you to do a house call because their tank of six goldfish is 'off colour'.

Answer **all** parts of this question:

- a) Describe the diagnostic approach to work up this case. (12 marks)
- b) Give **one (1)** example of a bacterial disease and **one (1)** example of a parasitic disease that can affect goldfish. Briefly describe predisposing factors to these diseases and the treatment of these diseases. (12 marks)
- c) List **three (3)** treatment chemicals commonly used to treat external conditions of ornamental fish and describe the water quality parameters (if any) that can influence the toxicity or effectiveness of these chemicals. (6 marks)

2. QX disease is endemic to New South Wales and Queensland estuaries.

Answer **all** parts of this question:

- a) Explain the life-cycle of the parasite *Marteilia sydneyi* and its host interaction with *Saccostrea glomerata* (Sydney rock oyster). (15 marks)
- b) Explain how this understanding of the parasite relates to current methods of control of the disease. (10 marks)
- c) Outline the laboratory tests used in the diagnosis of QX disease. (5 marks)

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3. Identify **two (2)** common non-infectious and **two (2)** infectious conditions of larval prawns in the first four weeks of their life. For each disease identified, describe the relevant aetiology, pathogenesis, and diagnostic findings. *(30 marks)*
  
4. Amoebic gill disease is now a significant production limitation for Atlantic salmon farming around the world.

Answer **all** parts of this question:

- a) Identify the aetiological agent. *(2 marks)*
  
- b) Describe the gross pathology of this disease. *(6 marks)*
  
- c) Briefly discuss the epidemiology of this disease. *(10 marks)*
  
- d) Relate the pathogenesis and epidemiology of this condition to treatment and control measures that might be implemented for farmed fish. *(12 marks)*

**End of paper**



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Answer **ALL FOUR (4)** questions

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# Paper 2: Medicine and Management of Aquaculture Species

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**Answer all four (4) questions**

1. If an outbreak of white spot syndrome virus (WSSV) were to occur again in Queensland, there could be serious consequences for Australia.

Answer **all** parts of this question:

- a) List the critical factors with respect to white spot disease (WSD) that need to be assessed when formulating an appropriate response. *(10 marks)*
- b) Describe an experimental study that aims to demonstrate, with statistical significance, the absence of WSSV in wild crustacean populations in the Gulf of Carpentaria. *(10 marks)*

Current policy in the WSD AQUAVETPLAN manual nominates three response options:

- eradication;
  - containment, control and zoning; and
  - control and mitigation.
- c) Discuss the possible advantages and disadvantages of eradication versus control and mitigation of WSD in the Australian context. (Do not discuss the containment, control and zoning option). *(10 marks)*

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2. A recirculation facility growing barramundi is experiencing an increase in mortalities.

Answer **both** parts of this question:

- a) Provide a ranked differential diagnosis list of possible non-infectious and infectious diseases. *(10 marks)*
- b) Nominate **one (1)** infectious and **one (1)** non-infectious disease and describe briefly a rational diagnostic approach to confirm the diagnosis. In addition, describe how the nominated conditions be treated or controlled or prevented. *(20 marks)*

3. Answer **both** parts of this question:

- a) In Europe, pharmaceutical companies sell more doses of vaccine for fish diseases than for any other animal. Describe how vaccines are administered in commercial fish production systems. *(18 marks)*
- b) Vaccines are variously described as autogenous, second generation vaccines (recombinant subunit vaccines), and third generation vaccines (DNA/mRNA vaccines). Briefly describe each type of vaccine, provide examples of bacterial and viral diseases protected against by each type of vaccine, and list the benefits and disadvantages (if any) of each type of vaccine. *(12 marks)*

4. A large commercial fish farmer with multiple ponds of stock has started feeding a new diet formulation to their stock. The farmer has noticed a subsequent decline in growth performance of the fish and asks you to investigate the change in performance.

Answer **both** parts of this question:

- a) Briefly describe issues and/or factors, other than the feed formulation itself, that can influence growth performance on a commercial aquaculture farm. *(15 marks)*
- b) Discuss the design of an appropriate on-site feed trial, including parameters that should be measured, to evaluate a new diet. Your answer should include formulas used to interpret the growth data. *(15 marks)*

**End of paper**