



## AUSTRALIAN AND NEW ZEALAND COLLEGE OF VETERINARY SCIENTISTS

### MEMBERSHIP GUIDELINES *Veterinary Public Health*

#### INTRODUCTION

These Membership Guidelines should be read in conjunction with the *Membership Candidate Handbook*.

#### ELIGIBILITY

Refer to the *Membership Candidate Handbook*.

#### OBJECTIVES

To demonstrate that the candidate has sufficient knowledge of and experience in veterinary public health to be able to give sound advice in this field to veterinary colleagues and the public at the advanced practitioner level. Membership is not a specialist qualification.

#### DESCRIPTION OF THE SUBJECT

Veterinary Public Health (VPH) is defined as **the contributions to the physical, mental, and social well-being of humans through an understanding and application of veterinary science** (WHO/FAO/OIE, 1999). Human health, animal husbandry and animal health are closely connected and VPH is a fundamental part of public health whereby human health and well-being are the main objectives. However, increasingly it is recognised that VPH also promotes environmental health by addressing the impact of agricultural and other animal related activities. VPH is multidisciplinary in its nature and contributes to many areas of public health that are not always directly related to animals.

VPH draws on the following areas of knowledge: diagnosis, surveillance, epidemiology, prevention, control, and elimination of zoonoses; protection of food (of animal origin including meat, milk, fish, and seafood) for human consumption; food and meat science; environmental protection; animal welfare; and the social and behavioral aspects of inter-human and human-animal relationships.

To integrate VPH into the goals of public health, it is essential to improve collaboration between human and veterinary medical science, environmental science, and other related fields in accordance with principles of 'One Health'.

## LEARNING OUTCOMES

The following description of topics and areas serves as a guide to the expected range and level of knowledge and skills to be demonstrated by the candidate. All candidates should address the material listed in the Core knowledge part. Candidates then should **select** either - Elective A **or** Elective B.

### CORE KNOWLEDGE:

**All candidates need to address the material in this section.**

#### 1. The Purpose and Scope of VPH

- 1.1. The candidate will have **sound knowledge**<sup>1</sup> of the purpose and scope of VPH.
- 1.2. The candidate will be able to do the following with **sound expertise**<sup>2</sup>:
  - 1.2.1. Illustrate common purposes and scope of VPH using examples of various applications of VPH in public health practice.
  - 1.2.2. Describe major challenges and/or achievements in VPH during the past century.
  - 1.2.3. Explain the structure of key VPH programs in Australia and New Zealand.
  - 1.2.4. Discuss the central role of veterinary public health principles in veterinary clinical practice (e.g dairy veterinary practice being completely reliant on safe milk; small companion animal practice being completely reliant on the social and mental wellbeing of people interacting with their animals).

#### 2. Zoonotic and Non-Zoonotic Diseases of Public Health Significance

- 2.1. The candidate will have **sound knowledge**<sup>1</sup> of:
  - 2.1.1. The aetiology, epidemiology, and control of endemic zoonoses of Australia or New Zealand and of exotic zoonoses of concern to Australia or New Zealand. Candidates should be able to address zoonoses associated with all animals (e.g., livestock, companion animals, wildlife, and aquatic species).
  - 2.1.2. The aetiology, epidemiology, and control of endemic and exotic non-zoonotic food-borne infections and intoxications of concern to Australia and New Zealand.
  - 2.1.3. The threat of emerging infectious diseases, including their sources, recognition, and investigation.
  - 2.1.4. The role of terrestrial and aquatic food producing animals, horses, companion animals and their environments in the emergence, maintenance, and transmission of antimicrobial resistance to humans with reference to prescribing practices and the need to reduce use of antimicrobial agents critically important in human medicine.
  - 2.1.5. The role of zoonotic disease in occupational health and safety in veterinary practice and the animal industries.

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<sup>1</sup> **Sound knowledge** – candidate must know all of the principles of the topic including some of the finer detail and be able to identify areas where opinions may diverge. A middle level of knowledge.  
**Basic knowledge** – candidate must know the main points of the topic and the major literature.

<sup>2</sup> **Sound expertise** – the candidate must be able to perform the technique with a moderate degree of skill and have moderate experience in its application. A middle level of proficiency.  
**Basic expertise** – the candidate must be able to perform the technique competently in uncomplicated circumstances.

- 2.2. The candidate will be able to do the following with **basic expertise**<sup>2</sup>:
- 2.2.1. Use epidemiological and investigational techniques employed in outbreaks of zoonotic and foodborne disease.
  - 2.2.2. Undertake surveillance programmes for zoonotic and non-zoonotic diseases, and describe procedures used for the diagnosis and surveillance of zoonotic and foodborne diseases.

### 3. Animal Welfare

- 3.1. The candidate will have a **basic knowledge**<sup>1</sup> of:
- 3.1.1. Intensive and extensive systems of animal management and welfare challenges that can occur in each type of system that will influence VPH.
  - 3.1.2. Welfare of food producing animals from farm to slaughter, including the standards set out in legislation and Codes of Practice in Australia or New Zealand.
  - 3.1.3. Welfare of animals during transport, including live animal export.

### 4. Infectious Disease Epidemiology

- 4.1. The candidate will have a **basic knowledge**<sup>1</sup> of:
- 4.1.1. The epidemiologic principles underpinning disease surveillance and the mechanisms for disease control within VPH.
  - 4.1.2. The strategies and tools required for investigation of infectious diseases in VPH settings.
  - 4.1.3. The appropriate strategies to monitor, investigate and control or prevent infectious diseases of VPH significance at the individual animal and population level.
  - 4.1.4. The capacity to appraise critically the evidence base for public health decision-making, including basic economic analyses.
  - 4.1.5. Approaches to and limitations in applying an eradication programme for an infectious disease of VPH significance.
  - 4.1.6. Principles and applications of other infectious disease control methods (e.g., isolation, movement control, compartmentalisation, vaccination, test, and cull) of relevance to VPH.

### 5. Risk Analysis

- 5.1. The candidate will have a **basic knowledge**<sup>1</sup> of:
- 5.1.1. The principles and process of risk analysis.
  - 5.1.2. The differences between qualitative and quantitative risk analysis.
  - 5.1.3. Hazard identification and categorising, including the difference between hazard and risk.
  - 5.1.4. The application of risk analysis in VPH scenarios, including import risk analysis, food safety management programmes and other pertinent areas.
- 5.2. The applicant will have **basic expertise**<sup>2</sup> to:
- 5.2.1. Undertake risk analysis in areas pertinent to VPH.

## **6. One Health**

6.1. The candidate will have **basic knowledge**<sup>1</sup> of:

6.1.1. The concepts of One Health, including how medical, veterinary, sociological, ecological, and other disciplines intersect and ultimately impact on VPH.

Candidates will select EITHER Elective A OR Elective B

**Elective A – Production of Safe Meat (red and white meat, game, eggs, fish, and other seafood) and the Exclusion of Foodborne Hazards from the Food Chain**

**1. Food Chain Safety and Health Hazards**

- 1.1. The candidate will have a **sound knowledge**<sup>1</sup> of:
  - 1.1.1. Ante-mortem and post-mortem factors affecting meat quality and food safety.
  - 1.1.2. Anatomical and physiological factors affecting humane stunning and slaughter and the associated impacts on food safety.
  - 1.1.3. As relevant to food safety, the physical and biochemical changes in muscle pre- and post-mortem, with special reference to rigor, factors affecting the physical and chemical qualities of meat at room temperature, chilling and freezing and the electrical stimulation of carcasses.
  - 1.1.4. Procedures used for reducing the contamination of animal carcasses, including prevention of contamination through to decontamination.
  - 1.1.5. Descriptions and consumer identification practices, including AUS-MEAT or New Zealand Meat Industry Association guidelines, as relevant to product integrity.
  - 1.1.6. Principles of preservation of meat including physical and chemical methods, e.g., refrigeration, vacuum packaging, canning, and curing, fermenting, irradiation) and the technology and public health aspects of essential food technologies (e.g., making sausages and other small goods).
  - 1.1.7. Principles of, and necessity for, species testing for meat and fish.
  - 1.1.8. By-product processing and rendering, and its impacts on animal-feed and food safety.
- 1.2. The applicant will have a **basic knowledge**<sup>1</sup> of:
  - 1.2.1. Effluent treatment and disposal from abattoirs and intensive farming operations.
- 1.3. The applicant will have a **sound knowledge**<sup>1</sup> of:
  - 1.3.1. Control of risk factors associated with food-borne pathogens during primary production.
  - 1.3.2. Water quality and sanitation in the food industry.
  - 1.3.3. Current risk-based approaches to inspection procedures for red and white meat, game, eggs, fish, and other seafood.
  - 1.3.4. Harvesting and processing game animals as relevant to either Australia or New Zealand including, but not restricted to, kangaroo, red deer, horses, camels, buffaloes, rabbits, possums, emu, ostriches, feral pigs, and crocodiles.
  - 1.3.5. Current animal identification and trace-back and trace-forward procedures for food producing animals as relevant to either Australia or New Zealand, including new international concepts like blockchain.
  - 1.3.6. Management of animals at lairages and ante-mortem inspection procedures.
  - 1.3.7. Humane slaughter procedures and relevance to food safety.
  - 1.3.8. Health certification of foods of animal origin.
  - 1.3.9. Best practices such as good manufacturing practices (GMP), good hygienic processes (GHP) and HACCP principles as they relate to primary and secondary production (e.g., on-farm food safety programs, processing, and abattoir programs).

- 1.4.0. The provision of assurance through the whole-of-chain by quality assurance, quality control and auditing.

## **2. Legislation, Regulation and Safe Food Production**

2.1. The candidate will have a **basic knowledge**<sup>1</sup> of:

- 2.1.1. The main global legislation and regulations relating to safe food production and trade, e.g., Codex Alimentarius, the World Trade Organisation's (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) and the Joint FAO/WHO Expert Committee on Food Additives (JECFA).
- 2.1.2. The role of VPH in the output from Australian or New Zealand organisations in food safety and food security, including the Australia and New Zealand Ministerial Forum on Food Regulation and Food Standards Australia New Zealand (FSANZ) and how global legislation and regulations are applied in the Australian or New Zealand context.

## **3. New Technologies with The Potential to Influence the Production of Safe Food.**

3.1. The candidate will have a **basic knowledge** of:

- 3.1.1. Genetic engineering and genetic modifications applied to food producing animals.
- 3.1.2. The perceived benefits and challenges associated with the production of alternative and laboratory-produced "meat" and animal products.
- 3.1.3. Direct molecular diagnostic tests for pathogens that can be applied at "point-of-need".
- 3.1.4. Genomic sequencing for diagnostic and/or forensic investigative use in food safety.

## **Elective B – Management of Animal Health Emergencies, Legislation, and New Technologies**

### **1. Animal Health Emergencies, with a Potential Public Health Consequence**

- 1.1. The candidate will have a **sound knowledge**<sup>1</sup> of:
  - 1.1.1. The principles of disease investigation as applied to VPH.
  - 1.1.2. The generalised course of animal disease outbreaks in susceptible populations.
  - 1.1.3. The main epidemiological questions faced by animal disease control managers during an epidemic.
  - 1.1.4. The main tools and techniques used during a disease investigation (e.g., modelling, geographical information systems [GIS], genomic sequencing).
  - 1.1.5. The collection of samples for testing, the importance of appropriate sampling and shipment techniques.
  - 1.1.6. Selection, strengths and weaknesses and interpretation (sensitivity, specificity, and predictive value) of laboratory tests.
- 1.2. The candidate will be able to do the following with **basic expertise**<sup>2</sup>:
  - 1.2.1. Select appropriate test types for specific investigations and interpret their results.
  - 1.2.2. Management of diseases emergencies.

### **2. Legislation, Regulation and VPH**

- 2.1. The candidate will have a **basic knowledge**<sup>1</sup> of:
  - 2.1.1. The role of science-based policy in the development VPH legislation and regulation.
  - 2.1.2. The role of VPH in the output from international organisations in animal health and zoonoses, particularly the World Health Organization (WHO), the Food and Agriculture Organization (FAO) and the World Organization for Animal Health (WOAH), in the management of animal health emergencies and in international trade.
  - 2.1.3. The respective legislative frameworks (national, federal, or state, as appropriate for Australia or New Zealand) that animal health emergencies of VPH significance would be managed to give effect to the requirements and recommendations of international standards such as WOAH's Terrestrial Animal Health Code.

### **3. New Technologies with The Potential to Influence the Management of Animal Health Emergencies of VPH Significance**

- 3.1. The candidate will have a **basic knowledge** of:
  - 3.1.1. Genetic engineering and genetic modifications.
  - 3.1.2. Direct molecular diagnostic tests that can be applied at “point-of-need” for rapid response.
  - 3.1.3. Genomic sequencing for diagnostic and/or forensic investigative use.

## EXAMINATIONS

For information on both the standard and the format of the Written and Oral examinations, candidates are referred to the *Membership Candidates Handbook*. The Membership examination has **two separate components**:

- **Written Examination (Component 1)**
  - Written Paper 1** (two hours): Core of the Subject
  - Written Paper 2** (two hours): Applied Aspects of the Subject (Electives A or B)
- **Oral Examination (Component 2)**
  - Oral** (one hour)

The written examination will comprise two separate two-hour written papers taken on the same day. There will be an additional 15-minute perusal time for each paper, during which no typing is permitted. In the first exam paper, all candidates will answer all questions from the Core Knowledge component of the Learning Outcomes. In the second paper, candidates must only answer questions from one elective, EITHER Elective A or Elective B. The exam may include a series of short answer questions, multiple-choice questions or may require an essay-type response. The exam is worth a total of 120 marks and all questions must be answered. Allocated marks to each question/ sub-question will be clearly indicated.

For Australian and New Zealand candidates, any questions concerning acts, regulations, guidelines, codes of practice and codes of ethical conduct, should be answered as they relate to the country in which they reside and work. Candidates working outside of either Australia or New Zealand may choose from which country perspective they will answer such questions, but the jurisdiction to which the response refers must be stated in all answers.

### Written Paper 1 (Core)

This paper is designed to test the candidate's knowledge of the core of the discipline as described in the Learning Outcomes above (Core Knowledge section). Answers may cite specific examples where general principles apply but should primarily address the theoretical basis underlying each example.

### Written Paper 2 (Elective A or B)

This paper will be designed to (a) test the candidate's ability to apply the distinct principles of VPH to situations or issues, and (b) test the candidate's familiarity with the discipline and current issues that arise from activities within their chosen discipline of VPH in Australia and New Zealand.

### Oral Examination

This examination is approximately 45–60 minutes and requires the candidate to demonstrate achievement of the above-mentioned Learning Outcomes. Question material will be delivered verbally and may include the use of photographs and other visual material. There will be a number of questions with a total of 100 marks given.



## RECOMMENDED READING

The candidate is expected to read widely within the discipline, paying particular attention to areas not part of their normal work experiences. The following list of material is a guide to some basic material. Mentors will be able to provide additional guidance.

The candidate is expected to research the depth and breadth of the knowledge of the discipline. *The list is not comprehensive and is not intended as an indicator of the content of the examination.* It is not intended that all titles are acquired or read, however, the selection may be useful to candidates with different access capabilities.

The Chapter recommends that all Membership candidates engage a mentor during their preparation for examinations. The value of a mentor should not be underestimated. Mentors can guide you further regarding study plans/techniques, depth of knowledge required, examination technique and, they may even facilitate practice exam questions or mock oral examinations. Some mentors may also run study groups, which enable you to work with other candidates during your preparation. Even if you are in a remote region, participation may still be available via email, phone, or digital platforms. Please consult the College website for a list of available mentors.

## RECOMMENDED TEXTBOOKS<sup>3</sup>

Andreissen EH (2012) *Meat: Safety, Quality and Veterinary Public Health in Australia* (11th edition) Penny Farthing Publishing Services, Adelaide.

Bauerfeind R, von Graevenitz A, Kimmig P, Schiefer HG, Schwarz T, Slenczka W and Zahner H (2016) *Zoonoses – Infectious Diseases Transmissible from Animals to Humans* (4<sup>th</sup> edition) ASM Press, Washington DC.

Cork S, Hall D and Liljebjelke (2016) *One Health Case Studies; addressing complex problems in a changing world*. 5M Publishing Ltd, Sheffield, UK.

Trevejo R (2009). Veterinary Public Health — *Small Animal Practice*. Veterinary Clinics of North America. *theclinics.com*, Volume 9, Number 2, March 2009.

Thrusfield M (2018). *Veterinary Epidemiology*, 4<sup>th</sup> Edition. Wiley-Blackwell.

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### 3 Definitions of Textbooks

**Recommended textbook** – candidates should own or have ready access to a copy of the book and have a sound knowledge of the contents.

**Additional references** – candidates should have access to the book and have a basic knowledge of the contents.

**Additional reading materials** -These are conference proceedings, other non-refereed publications and other journals that would offer some information in the subject area including differing points of view, but are not required reading.

## ADDITIONAL TEXTBOOKS

AS/NZS Standards (2009) *Risk Management Principles and Guidelines* ISO 31000. SAI Global Limited, Sydney.

Dvorak G, Roth JA, Gregory GC and Kaplan B (2013) *Zoonoses: protecting people and their pets*. IICAB, Iowa University Press, Ames.

<http://www.cfsph.iastate.edu/Products/zoonoses-protecting-people-and-their-pets.php>

Mortimer S and Wallace E (2014) *HACCP: a practical approach*. 3<sup>rd</sup> edition, Springer, New York. <https://www.springer.com/gp/book/9781461450276>

Toldra F (2017) *Lawrie's Meat Science*, 8<sup>th</sup> edition. Elsevier, Amsterdam.

<https://www.sciencedirect.com/book/9780081006948/lawries-meat-science#book-info>

## ADDITIONAL READING

Emergency Animal Disease Response Agreement - Animal Health Australia

<https://animalhealthaustralia.com.au/eadra/#:~:text=The%20EADRA%20is%20a%20unique%20contractual%20arrangement%20signed,prepare%20for%E2%80%94and%20respond%20to%E2%80%94emergency%20animal%20disease%20%EAD%29%20incursions.>

Informing EAD Responses - AUSVETPLAN - Animal Health Australia

<https://animalhealthaustralia.com.au/ausvetplan/>

Government biosecurity statements and strategies - Animal Health Australia

<https://animalhealthaustralia.com.au/government-biosecurity-statements-and-strategies/>

Biosecurity 2025 Direction Statement -Ministry for Primary Industries, New Zealand

<https://www.mpi.govt.nz/dmsdocument/14857-Biosecurity-2025-Direction-Statement-for-New-Zealands-biosecurity-system>

Introduction to Food Safety Legislation- Ministry for Primary Industries, New Zealand

<https://www.mpi.govt.nz/legal/legislation-standards-and-reviews/food-safety-legislation/introduction-to-food-safety-legislation/>

Food Standards Australia New Zealand

<https://www.foodstandards.govt.nz/Pages/default.aspx>

Other relevant journal and online reference material is available in the Veterinary Public Health Chapter website, Chapter Repository.

## **FURTHER INFORMATION**

For further information contact: the College Office

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