



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.

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 (including meat and milk) 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**¹ of the purpose and scope of VPH.
- 1.2. The candidate will be able to do the following with **sound expertise**²:
 - 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.

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

- 2.1. The candidate will have **sound knowledge**¹ 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 livestock, horses and companion animals in the emergence, maintenance and transmission of antimicrobial resistance to humans with particular reference to the need to reduce use of antimicrobial agents critically important in human medicine.
 - 2.1.5. Occupational health and safety in veterinary practice and the animal industries.
- 2.2. The candidate will be able to do the following with **basic expertise**²:
 - 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.

¹ **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.

² **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

3. Animal Welfare

3.1. The candidate will have a **sound knowledge**¹ of:

- 3.1.1. Intensive and extensive systems of animal management and welfare challenges that can occur in each type of system.
- 3.1.2. Factors that should be considered in the assessment of welfare of animals.
- 3.1.3. 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.
- 3.1.4. Welfare of animals during transport, including live animal export.
- 3.1.5. Welfare of animals used in education and research.
- 3.1.6. Welfare of companion animals in various settings including private ownership and animal shelters.
- 3.1.7. The concept of One Welfare and the potential for trade-offs between animal welfare, human well-being and environmental sustainability.

4. Infectious Disease Epidemiology

4.1. The candidate will have a **basic knowledge**¹ of:

- 4.1.1. The epidemiologic principles underpinning disease surveillance and the mechanisms for disease control.
- 4.1.2. The strategies and tools required for investigation of infectious diseases.
- 4.1.3. The examination and appraisal of disease surveillance systems.
- 4.1.4. The analysis, interpretation and presentation of disease incident and outbreak data.
- 4.1.5. The appropriate strategies to monitor, investigate and control or prevent infectious diseases at the individual animal and population level.
- 4.1.6. The capacity to appraise critically the evidence base for public health decision-making, including basic economic analyses.
- 4.1.7. Approaches to and limitations in applying an eradication programme for an infectious disease.
- 4.1.8. Principles and applications of other infectious disease control methods, e.g. isolation, movement control, compartmentalisation, vaccination, test and cull.

5. Risk Analysis

5.1. The candidate will have a **basic knowledge**¹ 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.

5.2. The applicant will have **basic expertise**² to:

- 5.2.1. Undertake risk analysis in areas pertinent to VPH.

6. One Health

6.1. The candidate will have **basic knowledge**¹ of:

- 6.1.1. The concepts of One Health, including how medical, veterinary, sociological, ecological and other disciplines intersect.
- 6.1.2. The changing patterns of global health governance and their relevance to the development and implementation of global health policy.
- 6.1.3. Other emerging paradigms such as Planetary Health, Global Health and Eco-health.

Candidates will select EITHER Elective A OR Section B

Elective A – Production of Safe Meat (red meat, poultry, fish and game)

1. Food Chain Safety and Health Hazards

- 1.1. The candidate will have a **sound knowledge**¹ of:
 - 1.1.1. Ante-mortem and post-mortem factors affecting meat quality.
 - 1.1.2. Anatomical and physiological factors affecting humane stunning and slaughter.
 - 1.1.3. 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 the decontamination of animal carcasses.
 - 1.1.5. Carcass composition and classification, including cuts of meat, names of muscles which make up cuts, trade (product) descriptions and consumer identification practices, including AUS-MEAT or New Zealand Meat Industry Association guidelines.
 - 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 making sausages and other small goods.
 - 1.1.7. Principles of species testing for meat and fish.
 - 1.1.8. By-product processing and rendering.
- 1.2. The applicant will have a **basic knowledge**¹ of:
 - 1.2.1. Effluent treatment and disposal from abattoirs and intensive farming operations.
- 1.3. The applicant will have a **basic knowledge**¹ of:
 - 1.3.1. The on-farm/production site factors affecting food-borne pathogens.
 - 1.3.2. Water quality and sanitation in the food industry.
 - 1.3.3. Current practices in meat inspection procedures for red meat, game and meat chickens.
 - 1.3.4. Harvesting and processing game animals such as kangaroo and red deer and also general knowledge of processing of species such as 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.
 - 1.3.6. Management of animals at lairages and ante-mortem inspection procedures.
 - 1.3.7. Humane slaughter procedures.
 - 1.3.8. Health certification of foods of animal origin
 - 1.3.9. Good manufacturing practices (GMP), good hygienic processes (GHP) and HACCP principles.

Elective B – Management of Animal Health Emergencies, Legislation, Environmental Protection and New Technologies

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

- 1.1. The candidate will have a **basic knowledge**¹ 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])
 - 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**²:
 - 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**¹ 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 Australian or New Zealand organisations in the area of food safety, food security, animal health and zoonoses, including. The Australia and New Zealand Ministerial Forum on Food Regulation, Food Standards Australia New Zealand (FSANZ) and the Australian Animal Health Committee.
 - 2.1.3. The role of VPH in the output from international organisations in the area of food safety, food security, animal health and zoonoses, particularly the World Trade Organization (WTO), including the Agreement on the Application of Sanitary and Phytosanitary Measures, the World Health Organization (WHO), the Food and Agriculture Organization (FAO) of the United Nations, the World Organization for Animal Health (OIE), Codex Alimentarius, and the Joint FAO/WHO Expert Committee on Food Additives (JECFA).

3. New Technologies with The Potential to Influence VPH

- 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. Production of synthetic foods such as artificial meat.

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**:

- 1. 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)
- 2. 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 minutes perusal time for each paper, during which no writing on the examination paper is permitted. In the first exam paper, all candidates will answer all questions from the Core. In the second paper, candidates must only answer questions from one elective, EITHER Elective A or Elective B. Each paper will comprise four (4) questions, worth 30 marks each, giving a total of 120 marks per paper. Questions may be long essay type, a series of shorter answer sub-questions, or multiple-choice questions. Marks allocated to each question and to each subsection of questions will be clearly indicated on the written paper.

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 particular 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 five (5) to eight (8) main questions with a total of 100 marks.

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. This list is intended to guide the candidate to some major references (indicated by an *) and source material. *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 located in a remote region, participation may still be available via email, phone, Skype, FaceTime or Whatsapp interactions. Please consult the College website for a list of available mentors.

TEXTBOOKS³

*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* (4th edition) ASM Press, Washington DC.

*Buncic S (2006) *Integrated Food Safety and Veterinary Public Health*. CABI Publishing, Wallingford, Oxfordshire.

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

*Pfeiffer D (2010). *Veterinary Epidemiology — an Introduction*. Wiley Blackwell, Chichester.

*Trevejo R (2009). *Veterinary Public Health — Small Animal Practice*. Veterinary Clinics of North America.

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.

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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*. 3rd edn, Springer, New York.

<https://www.springer.com/gp/book/9781461450276>

Toldra F (2017) *Lawrie's Meat Science*, 8th edn. Elsevier, Amsterdam.

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

ADDITIONAL READING

Relevant journal and online reference material is available in the Veterinary Public Health Chapter: Website Repository at:

<https://ripehosting.blob.core.windows.net/anzcvms-prod-media/23328/Additional%20reading%20material%20-%20VPH%20membership%20subject%20guide%202018.docx>

FURTHER INFORMATION

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