



# Australian and New Zealand College of Veterinary Scientists

## Membership Examination

June 2019

### Animal Nutrition (Ruminant) Paper 1

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

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

Answer **ALL FOUR (4)** questions

Answer **FOUR** questions, each worth 30 marks ..... total 120 marks

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Enquiries should be addressed to the Australian and New Zealand College of Veterinary Scientists.

# Paper 1: Animal Nutrition (Ruminant)

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**Answer all four (4) questions**

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

- a) Define the terms gross energy, digestible energy, metabolisable energy and net energy and show the relationships between these concepts, including any losses that occur. *(15 marks)*
- b) Identify sources of metabolisable energy and explain how they are utilised by ruminants for maintenance and production. *(15 marks)*

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

- a) Identify plant, animal and management/environmental risk factors for the development of hypomagnesaemia in ruminants. *(10 marks)*
- b) Considering the homeostatic mechanisms and factors affecting dietary magnesium availability, discuss the aetiopathology of hypomagnesaemia in ruminants. *(20 marks)*

3. For a ruminant species of your choice, discuss the roles of each of the following two minerals with respect to maintenance of health, the clinical syndromes associated with both deficiency and excess, and practical methods of supplementation:

- a) Selenium. *(15 marks)*
- b) Iodine. *(15 marks)*

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4. Matching feed requirements (demand) with feed grown (supply) is critical to feeding ruminants on permanent pasture. Identify a climate and pasture species with which you are familiar. For your climate and pasture species:
- a) Discuss the factors that influence pasture growth through the seasons and outline your approach to managing both deficits and surpluses in total dry matter available. *(15 marks)*
  - b) Describe the variations in pasture feed quality (e.g. metabolisable energy, crude protein, neutral detergent fibre, macrominerals) throughout the year and explain how these variations could be minimised or mitigated. *(15 marks)*

**End of paper**



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### Animal Nutrition (Ruminant)

### Paper 2

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Answer **ALL FOUR (4)** questions

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# Paper 2: Animal Nutrition (Ruminant)

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**Answer all four (4) questions**

1. Answer **both** parts of this question:
  - a) Discuss the benefits and disadvantages of improved heifer growth rates, focussing on any net benefits to producers. *(15 marks)*
  - b) Describe the goals, practical strategies and risks associated with weaning management in a heifer rearing system. *(15 marks)*
2. A dairy client contacts you because they have noticed that the herd's milk fat percentage has steadily fallen from 4.1% to 3.2%. The milk protein percentage has remained constant at 3.2% and the litres produced are increasing. The herd is predominantly fed on ryegrass/clover pasture, with 6 kg rolled wheat fed twice a day in the milking shed.

Answer **both** parts of this question:

- a) Identify the most likely underlying cause(s) of this problem and briefly discuss risk factors potentially associated with the development of this underlying problem. *(20 marks)*
- b) Discuss an appropriate approach to the examination of the adequacy of the ration, relative to this problem. In your answer, include any additional tests that should be performed. *(10 marks)*

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3. Forage crops can be used in pastoral ruminant systems when existing pasture growth does not meet the animals' nutritional demand. For the crop and stock class of your choice, provide appropriate advice to a client on best-practice management of the crop. Include in your answer:
- a) Management of the group and appropriate transition onto the crop so that the requirements of all animals in the group are met. *(15 marks)*
  - b) Effective management of any expected nutrient excesses and deficiencies in the crop/animal. *(10 marks)*
  - c) Appropriate monitoring of animal performance on the crop. *(5 marks)*

4. A client contacts you because he is disappointed with the pregnancy scanning percentage of his Coopworth two-tooth ewes.

Answer **both** parts of this question:

- a) Describe, in detail, the further questions that should be asked of the farmer in order to investigate this problem further. *(20 marks)*
- b) Describe the tests and/or monitoring programs that should be performed and put in place in the future to reduce the risk of reproductive failure. *(10 marks)*

**End of paper**