



# Australian and New Zealand College of Veterinary Scientists

## Membership Examination

June 2013

## 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

# Paper 1: Animal Nutrition (Ruminant)

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Answer all four (4) questions

1. Answer **all** parts of this question:
  - a) Categorise the nutrients consumed by adult ruminants, prioritising them in order of importance to healthy metabolism and function of both the rumen microflora and the ruminant animal itself. *(10 marks)*
  - b) Justify your order of prioritisation with reference to key metabolic systems. *(10 marks)*
  - c) Choose and name **two (2)** forages/feeds/feedstuffs as examples of each of the nutrient categories that you have categorised above to demonstrate how different **feeds/ingredients** can be combined to formulate a nutritionally balanced ration. *(10 marks)*
2. Discuss the consequences of deficiency and excess of nutrients during the three stages of pregnancy on neonate development and survival. Include examples for **both** cattle and sheep in your answer. *(30 marks)*
3. Discuss the factors affecting feed intake in ruminants by categorising into **three (3)** broad categories. *(30 marks)*
4. Answer **all** parts of this question:
  - a) Illustrate using words, and diagrams when appropriate, how nitrogen containing compounds are taken in, digested, metabolised, secreted and excreted by ruminants. *(20 marks)*
  - b) Highlight the key points at which transformations occur. *(10 marks)*

**End of paper**



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## Paper 2

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

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Answer **ALL FOUR (4)** questions

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

# Paper 2: Animal Nutrition (Ruminant)

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## Answer all four (4) questions

1. Ruminant nutritional disorders and pathology may arise from the presence of contaminants within feedstuffs. Of the contaminants of biological origin, the most important (from a pathological and economic viewpoint) are the fungal toxins, otherwise known as mycotoxins.
  - a) Discuss the major factors contributing to the contamination of ruminant feedstuffs with mycotoxins. (10 marks)
  - b) Identify **three (3)** major mycotoxins affecting ruminants and list their mode(s) of action and the effects of these mycotoxins on ruminant health and production. (20 marks)
2. Discuss the concepts 'managing pasture for maximal harvest per hectare' and 'managing pasture for maximal animal production per hectare'. In your answer you must summarise the arguments for both concepts (10 marks); critically analyse how both can be 'held in an optimal balance' over the annual cycle of a pasture-based ruminant operation (10 marks); and include examples demonstrating how prioritising one outcome may be detrimental to the other. (10 marks)
3. Discuss some of the limitations of routinely available commercial laboratory feed testing available in Australia and New Zealand (20 marks). Include in your argument examples of animal health and production issues, and why attention to these limitations is important in ruminant production operations. (10 marks)
4. You are called to provide advice to a local feedlot. The manager informs you that many cattle appear to be 'off feed' (indicated by large amounts of uneaten feed in the bunks) and the pen riders have noted 'loose, light coloured faeces' in many pens. You have visited and taken a number of rumen fluid samples from randomly selected animals. Your tests indicate that rumen pH is in the range of 4.8 to 5.5 and lactate concentrations are in the range of 5 to 50 mmol/L.
  - a) Justify whether in your opinion these feedlot animals have acute or subacute (or both) ruminal acidosis, including a clear description of each condition. (10 marks)
  - b) Describe the physiology of ruminal acidosis, explaining why changes occur in rumen fluid pH, lactate concentrations and osmolality. (20 marks)

**End of paper**