



# Australian and New Zealand College of Veterinary Scientists

## Membership Examination

June 2015

## 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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# Paper 1: Animal Nutrition (Ruminant)

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Answer all four (4) questions

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

- a) Describe protein digestion and metabolism in production ruminants. (20 marks)
- b) Discuss why targeted amino acid supplementation can result in an increase in production in ruminants. (10 marks)

2. Discuss how the following factors influence immune function of the ruminant:

- a) Vitamin E/ selenium. (15 marks)
- b) Energy intake during the transition period. (15 marks)

3. The proximate analysis procedure has been criticised in some literature as being archaic and imprecise.

Answer **both** parts of this question:

- a) Discuss the feed fractions reported by the proximate analysis procedure. In your answer include the strengths **and** limitations of the proximate analysis procedures for **each** of these fractions. (20 marks)
- b) Choose **one (1)** of the proximate analysis fractions and discuss alternative **and** more acceptable analytical methods for analysing and reporting this fraction. (10 marks)

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4. Methane and greenhouse gasses have had an increased focus in agriculture in recent years. You have been invited to speak to final year veterinary science students on this topic and decide the key topics that you should cover include:

- Background information.
- How methane is produced by ruminants.
- Nutritional strategies to reduce methane production by ruminants.
- Production benefits from methane reduction.

Write a handout that addresses the key points above, **and** any additional information that you consider of relevance to this audience. *(30 marks)*

**End of paper**



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## 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. You are called to an autumn lambing Dorset and Dorset-cross flock. This flock historically has a >180% lamb crop, with <2% total ewe death loss through the entire lambing season. This year, 8/150 ewes have died during the first 3 weeks of lambing; the farmer reports that they were in good body condition (BCS 4-5).

You examine 2 ewes yet to lamb. One is lethargic, anorectic and has moderate ketonuria. The other is recumbent, with depressed mentation, severe ketonuria and is 5% dehydrated. Both ewes are in good body condition. Biochemistry results reveal significantly elevated alkaline phosphatase activity, elevated non-esterified fatty acid (NEFA) concentrations and low cholesterol concentrations.

Answer **both** parts of this question:

- a) Discuss the most likely diagnosis. Include in your answer the pathophysiology leading to the observed clinical signs and biochemical results. *(15 marks)*
- b) Describe possible treatments for affected ewes, preventative measures for the remaining pregnant ewes **and** a management program for prevention of the problem in future years. *(15 marks)*

2. 'Rumen stability is fundamental to achieving optimal ruminant animal performance from any ration.'

Answer **all** parts of this question:

- a) Define the categories of microorganisms in an optimal functioning rumen, including a brief description of their roles in fermentation of feedstuffs. *(5 marks)*
- b) Briefly describe the changes in the rumen microbial population that occur as rumen pH decreases. *(5 marks)*
- c) Discuss factors that influence rumen stability and the observations/tests that could be utilised to monitor this stability. *(20 marks)*

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3. A producer is considering changing from a pasture based production system to a partial mixed ration (PMR) or a total mixed ration (TMR).

For a production system of your choice (dairy cattle, beef cattle or sheep):

- a) Describe the advantages **and** disadvantages of PMR/TMR systems (compared to a pasture only system). *(15 marks)*
- b) Discuss factors that should be considered in making an informed decision to implement PMR/TMR. Include in your answer consideration of economic drivers, implementation and logistical considerations, management strategies to reduce the risk of disease and production losses, and any other factors you consider to be of relevance. *(15 marks)*

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

- a) Discuss the factors that influence the quality of a 'general' silage crop at harvest **and** the quality of the end product after conservation as bulk stored silage for sheep/cattle diets. *(15 marks)*
- b) For **each** of the following forages, briefly describe the unique considerations when using them for silage:
  - i. lucerne *(5 marks)*
  - ii. whole crop cereal *(5 marks)*
  - iii. maize. *(5 marks)*

**End of paper**