



Australian and New Zealand College of Veterinary Scientists

Membership Examination

June 2016

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 markstotal 120 marks

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Paper 1: Animal Nutrition (Ruminant)

Answer all four (4) questions

1. Skeletal development is a critical part of the growth of a young ruminant that is often influenced by the nutritional composition of the diet.

Answer **both** parts of this question:

- a) List key nutrients required for adequate skeletal integrity during growth. Explain the potential clinical and sub-clinical consequences of both an excess and a deficiency (as appropriate) of **each** of the listed nutrients to a growing skeleton. *(15 marks)*
- b) Define the feeds and/or feeding practices that contribute to an excess or deficiency of **each** of the listed nutrients. *(15 marks)*

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

- a) Using examples, briefly discuss feed **and** animal factors that influence rumen outflow rate. *(10 marks)*
- b) Discuss potential consequences to the ruminal metabolism of feed components when rumen outflow rate is rapid. *(20 marks)*

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

- a) Describe in detail the changes to the rumen fermentation when ionophors are added to the diet. *(20 marks)*
- b) Briefly discuss the potential effects of inclusion of dietary ionophors on animal productivity and animal health for a dairy cow in early lactation. *(10 marks)*

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4. Briefly discuss the occurrence of, and the expected pathology, pathogenesis and clinical signs in ruminants for the following dietary challenges:
- a) zearalenone in maize grain (10 marks)
 - b) pasture molybdenum concentrations that exceed 15mg/kg of dry matter (15ppm)
(10 marks)
 - c) ingestion of *Senecio jacobaea* (ragwort). (10 marks)

End of paper



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Paper 2

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Answer **ALL FOUR (4)** questions

Answer **FOUR** questions each worth 30 markstotal 120 marks

Paper 2: Animal Nutrition (Ruminant)

Answer all four (4) questions

1. You are called to a breeding ewe property to investigate a high incidence of recumbency and death in lambs between three and six weeks of age. Losses have reached 30/1100 births. Lambs are still receiving milk from ewes consuming leafy ryegrass-clover dominant pastures.

Clinical examination of lambs demonstrates weakness, inability to rise or stand for prolonged periods, and in some, but not all lambs, respiratory distress. Lambs are on average, bright and alert. You perform autopsies on three lambs that have recently died. Streaky pale discolouration of skeletal muscles of two of three lambs is seen.

Answer **both** parts of this question:

- a) Discuss the most likely diagnosis and how you would confirm your diagnosis. In your answer include the predisposing cause(s) of this condition and the pathophysiology leading to the observed clinical signs and changed muscle appearance. *(15 marks)*
- b) Describe potential treatments for remaining lambs and ewes and a prevention program to avoid this condition in future years. *(15 marks)*

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2. A dairy client has asked you for help dealing with a number of sudden deaths in his late lactation, spring calved dairy cows. Cows are grazing 100% of the diet as extremely high quality, nitrogen fertiliser boosted perennial ryegrass/white clover pastures. On the day of your visit you observe the cows as being irritable, hyper-excitable and one cow convulses and dies before you can clinically examine her.

Answer **all** parts of this question:

- a) List potential causes of the observed clinical signs. (5 marks)
- b) For **one (1)** condition that is most likely causing these signs:
- i. Describe the pathogenesis contributing to the hyper-excitability seen in the cows, as well as the sudden cow deaths. (10 marks)
 - ii. Discuss how to confirm your diagnosis. (5 marks)
 - iii. Describe a prevention program to resolve this case. (10 marks)
3. You are called to investigate a problem of one-year-old 240 kg liveweight beef steers refusing to consume maize (corn) silage. The steers are set stocked on paspalum dominant pastures, and are being offered maize silage every second day. Detail your approach to investigating why the cattle are rejecting the maize silage. Include a discussion of silage, pasture management and animal factors that may be contributing to silage refusal. (30 marks)
4. Your client has asked you for advice on pre-mating supplementation for his ewes. The property is suffering from severe drought with no pasture available. He has a supply of drought affected wheaten hay (10.0 MJME/kgDM, crude protein 12%, NDF 43%, WSC 30%, starch 0%). The supply of hay will not be sufficient to fully feed the ewes. The ewes weigh around 60 Kg liveweight. Discuss which of the following available supplements would be best to nutritionally complement the wheaten hay. Include in your answer the potential nutritional, practical and economic merits and/or challenges of **each** of the listed feeds. Include recommendations for nutritional additives that may improve the suitability of **each** feed type as a complementary feed for the wheaten hay. (30 marks)
- whole wheat grain
 - citrus pulp
 - lupins.

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