Australian and New Zealand College of Veterinary Scientists

Membership Examination

June 2017

Animal Nutrition (Ruminant)

Paper 1

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

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

Answer **ALL** <u>**FOUR (4)**</u> questions

Question 4 a) requires completion of the table located in the answer booklet that has been provided to you.

Answer <u>**FOUR**</u> questions each worth 30 marks ....total 120 marks

Paper 1: Animal Nutrition (Ruminant)

Answer all four (4) questions

1.   Compare and contrast the digestive systems of the pre-ruminant and adult ruminant **and** discuss the differences in digestion between the two stages.   *(30 marks)*

2.   An adequate supply of good quality water is critical to any successful ruminant production system. Water is also often used as a vehicle for the delivery of trace elements and some medications.

      Answer **all** parts of this question:

      a) Describe the main functions of water in a ruminant animal. List the circumstances where free water requirements will be increased.   *(10 marks)*

      b) Discuss the advantages **and** disadvantages of the use of stocking drinking water to deliver macro and trace elements in the production system of your choice.
(14 marks)

      c) Briefly describe **three (3)** potential water contaminants and their effects on ruminants.   *(6 marks)*

3.   It is the relationship between plants and grazing ruminants that makes the nutritional management of pasture systems complex. Discuss the animal and pasture factors that determine potential dry matter intake (DMI) in ruminants grazing on pasture.
(30 marks)

Continued over page

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

a) Choose **two (2)** of the feeds listed in the table provided in your answer booklet, and from your knowledge of the feeds, provide an estimate for **each** feed chosen of a typical range for the following parameters: *(8 marks)*

   - dry matter (%)

   - metabolisable energy (MJME)

   - neutral detergent fibre (%)

   - acid detergent fibre (%)

   - starch (%)

   - water soluble carbohydrate (%)

   - fat (%)

   - crude protein (%)

b) For **each** of your **two (2)** chosen feeds, describe **why** and **how** you would feed them in the system of your choice. Include in your answer any particular risks associated with your chosen feeds **and** how you would mitigate these risks.

(22 marks)

End of paper

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Paper 2

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

Answer **ALL** <u>**FOUR (4)**</u> questions

Answer <u>**FOUR**</u> questions each worth 30 marks ....total 120 marks

Paper 2: Animal Nutrition (Ruminant)

Answer all four (4) questions

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

    a) List **ten (10)** factors that could affect the quality **and** quantity of colostrum produced.   *(5 marks)*

    b) Discuss a practical plan for a dairy farmer to optimise the effective delivery of high quality colostrum to their newborn calves.   *(20 marks)*

    c) Outline the parameters you would monitor to measure the effectiveness of this practical plan **and** explain why they are appropriate measures.   *(5 marks)*

2. A dairy farmer in a split calving area has reported that up to 30% of his Jersey dairy cows are 'going down'/becoming recumbent just before, at, or shortly after calving. The farmer feeds his dry period cows very well, as he believes they milk better if they have a heavy condition score (average herd body condition score of 4/5 [USA]; 6.5/8 [Australia]; 6/10 [New Zealand]). The cows are fed ad lib pasture, oaten hay in ring feeders, and wheat grain in the dairy before and after calving. The cows receive no mineral supplements.

    Answer **both** parts of this question:

    a) Outline a systematic approach to investigating the potential causes of peri-parturient recumbency in this herd.   *(10 marks)*

    b) Your test results on blood collected from ten peri-parturient cows show hypocalcaemia, hypomagnesaemia and hyperketonaemia in eight of the ten cows sampled. Discuss your recommendations to reduce the incidence and prevalence of sub-clinical and clinical metabolic disease in this herd.   *(20 marks)*

3.   A farmer contacts you requesting advice on testing their pasture and conserved forages.

        Answer **all** parts of this question:

        a) Discuss how you would explain to the farmer why laboratory feed-test results on fresh pasture and conserved forages don't always correctly represent the true quality of the tested feed.   *(10 marks)*

        b) List and briefly describe **five (5)** key requirements when collecting pasture and silage samples to ensure an optimal laboratory analysis.   *(5 marks)*

        c) Provide detailed advice the farmer can use to incorporate field observations to add value to the interpretation of the laboratory analysis of their feeds.
                                                                                    (15 marks)

4.   You are called out to examine a mob of weaned prime lambs. Over the last four days, 6% have become sick and some have died. The weaners were recently moved onto a lucerne/annual ryegrass sward after the autumn break. The affected animals are showing a range of signs, including agitation, muscle fasciculation, abnormal gait, apparent blindness, head pressing, lateral recumbency, seizures and death. Most of the dead animals have died within 24–48 hours of becoming recumbent.

        Answer **all** parts of this question:

        a) Discuss the immediate actions that could be undertaken to allow a more complete diagnosis to be made from the various possible diagnoses.   *(4 marks)*

        b) Explain the aetiology and pathogenesis of polioencephalomalacia (PEM).
                                                                                    (12 marks)

        c) Assuming the diagnosis is PEM, what advice would you give the farmer to manage the current outbreak of the disease in this flock **and** what nutritional advice can be given to the farmer to help prevent cases in the future?
                                                                                    (14 marks)

End of paper