



# Australian and New Zealand College of Veterinary Scientists

## Fellowship Examination

June 2018

# Dairy Cattle Medicine and Management Paper 1

Perusal time: **Twenty (20)** minutes

Time allowed: **Three (3)** hours after perusal

Answer **ALL SIX (6)** questions

All six questions are of equal value

Answer **SIX (6)** questions, each worth 30 marks .....total 180 marks

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# Paper 1: Dairy Cattle Medicine and Management

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Answer all six (6) questions

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

- a) Describe the clinical presentation and pathogenesis of *Listeria monocytogenes* in dairy cattle. Please include where, in the animal's environment, the pathogen survives and how it gains entrance into the host. (15 marks)
- b) Discuss the most appropriate methods of treating calf septicaemia **and** justify your treatment choices with reference to physiology and/or the available literature. (15 marks)

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

- a) Discuss diagnostic tests available for confirming cryptosporidiosis in a calf with diarrhoea and justify the most appropriate diagnostic test. (5 marks)
- b) List the *Cryptosporidium* species that affect cattle and humans. Identify group(s) of people that are susceptible to cryptosporidiosis. (5 marks)
- c) Discuss principles of disease containment and apply these to control measures that can be implemented to minimise the spread of cryptosporidia within a dairy calf group. (15 marks)
- d) Describe a biosecurity plan to mitigate the risk of zoonotic cryptosporidiosis in a group of 50, 10-day-old Jersey calves with yellow watery diarrhoea. (5 marks)

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3. Answer **all** parts of this question:
- a) Discuss the immunoglobulins present in colostrum and the mechanisms whereby they are transferred into colostrum. (6 marks)
  - b) Discuss the direct tests that are available to measure immunoglobulin (IgG) concentration in serum. Define and justify the threshold(s) that is/are used to evaluate the effectiveness of passive transfer in calves. (6 marks)
  - c) Identify indirect methods used to evaluate inadequate transfer of passive immunity (ITPI) in calves. Discuss why these tests are more commonly used and their limitations, compared with direct methods. (6 marks)
  - d) With reference to the literature, discuss the volume, quality, time and method of colostrum administration that is required for optimal passive immune transfer in a calf. (12 marks)
4. Answer **both** parts of this question, regarding **two (2)** different diseases:
- a) Discuss the epidemiology of the fungus *Pithomyces chartarum* and explain how epidemiological and other information can be utilised to predict risk periods for the development of facial eczema associated with this organism. (15 marks)
  - b) Discuss the epidemiology of liver fluke, *Fasciola hepatica*, infection, including the areas in Australia where liver fluke disease is recognised as causing production losses. Describe the difficulties in the control of *Fasciola hepatica* in irrigated areas of Victoria. (15 marks)
5. Answer **both** parts of this question, regarding **two (2)** different diseases:
- a) Discuss the aetiology and epidemiology of foot-and-mouth disease. Briefly describe the control options (including the problems that might be associated with each option) that might be considered if foot-and-mouth disease were to gain entry into Australia. (15 marks)
  - b) Discuss the aetiology and pathogenesis of babesiosis, ‘tick fever’, and discuss the methods used to control this disease. (15 marks)

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6. *Theileria orientalis* (so-called benign theileriosis) is an emerging disease in Australia and New Zealand.

Answer **all** parts of the question:

- a) Briefly describe the history of oriental theileriosis in Australasia. (4 marks)
- b) Describe the life cycle and pathogenesis of theileriosis. (4 marks)
- c) Describe the clinical signs associated with *Theileria orientalis* (Ikeda) infection in cattle. (4 marks)
- d) Discuss the laboratory tests that can be used to confirm a diagnosis of theileriosis, including practical means to classify the strain types. (9 marks)
- e) Discuss the treatment and control options for theileriosis. Include in your answer a practical technique for blood transfusion in adult cattle. (9 marks)

**End of paper**



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June 2018

## Dairy Cattle Medicine and Management Paper 2

Perusal time: **Twenty (20)** minutes

Time allowed: **Three (3)** hours after perusal

Answer **ALL SIX (6)** questions

All six questions are of equal value

Answer **SIX (6)** questions, each worth 30 marks .....total 180 marks

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# Paper 2: Dairy Cattle Medicine and Management

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Answer all six (6) questions

1. You attend a group of sick cows on one of your client's farms. The farmer milks 300 commercial Holstein cows.

On arrival, the herd owner tells you that he has 40 cows about which he is very concerned. He suspects that his farm worker may have incorrectly measured the amount of wheat to be placed into the farm mixer wagon and that the cows may be suffering from grain overload.

On initial inspection of the sick mob, you observe that six cows are down and near comatose, another eight are down with their heads turned to their flanks and 20 of the others are ataxic.

Answer **all** parts of this question:

- a) Describe your initial approach to this problem. Your response should include an appropriate list of differential diagnoses and initial diagnostic testing, including the rationale and expected results for each nominated test or procedure. *(10 marks)*
- b) Discuss the pathogenesis of acute ruminal acidosis. *(10 marks)*
- c) Discuss the treatment of these animals, including in your answer the physiological rationale for **each** procedure. You are able to call on the assistance of one veterinarian from your practice. *(10 marks)*

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2. A client contacts you to discuss the possibility of changing his mastitis-control dry-off protocol from blanket to selective antibiotic dry-cow treatment. The client milks two herds, each of approximately 800 cows, and they are strictly seasonally calving herds - all of the cows retained in the herd calve in August and September each year.

Answer **all** parts of this question:

- a) Compare the benefits of a selective dry-cow treatment with blanket treatment indicating, on the basis of currently available literature, which approach is considered better practice under what conditions. *(7 marks)*
- b) List the factors that the owner should consider in deciding whether or not selective dry-cow treatment is suitable for his herd. *(7 marks)*
- c) Discuss the selection process used to decide which cows should be treated and the available treatment options. Your response should include the potential use of internal teat sealants (ITS). *(8 marks)*
- d) Discuss the risks of a selective antibiotic treatment approach that, in many cases, will involve the use of ITS. List the key steps the farmer can take to minimise these risks. *(8 marks)*

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3. Calving induction is a tool that has been used widely for many years in seasonal-calving dairy herds in Australia and New Zealand. However, its use in New Zealand has been phased out and the procedure is also being phased out by the Australian dairy industry - the maximum number of cows that could be induced to calve prematurely in a herd in 2017 was 12%, reducing to 10% in 2018 and 8% in 2019.
- With this information in mind, a dairy farmer client, milking 900 cows in a strictly seasonal-calving herd (calving in August and September), approaches you to seek advice on how he can maximise the reproductive performance of his herd so that he is able to work with the reduced percentage of cows in his herd that can be induced to calve prematurely, and the ultimate phase-out of the procedure. The farm is well-managed and the operator open to all advice, but the farm operates as a closed herd, so purchase of additional cows is unacceptable.

Answer **both** parts of this question:

- a) Discuss the importance **and** impact of the following issues:
- i. management and growth of young stock (4 marks)
  - ii. options for heifer mating (3 marks)
  - iii. managing the body condition of the herd (3 marks)
  - iv. bull management (3 marks)
  - v. managing uterine infections after calving (3 marks)
  - vi. heat detection (3 marks)
  - vii. management over the mating period, including how you would handle any cows not detected on oestrus (3 marks)
  - viii. longer-term genetics to improve herd fertility. (4 marks)
- b) Describe measures of reproductive performance for a seasonally calving herd and outline how this herd's progress should be monitored. (4 marks)

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4. You are called to examine a sick cow on a 400-cow, pasture-based, split calving herd. The farm owner has called you to examine this animal because he has had two cows die in the last week after showing similar clinical signs. He has observed that the cows go off their milk, become depressed, have profuse diarrhoea, develop sunken eyes, finally become recumbent and die. He has treated them with procaine penicillin at the appropriate dose rate, but this appears to have had little effect.

Upon examining the cow in the yard, you notice that she has sunken eyes and is wet around the tail. On your initial clinical examination, you determine that her urine is slightly acidic; temperature is 38.5°C; heart rate is 108 beats per minute; respiratory rate is 40 breaths per minute; and her rumen sounds are markedly reduced at one weak contraction per four minutes. She calved six days ago. On transrectal examination, you find that her faeces are bloody and contain shreds of mucous membrane.

Answer **all** parts of this question:

- a) Identify any further components of the clinical examination that should be conducted at this time. (1 mark)
- b) Based on the signs described above, create a list of differential diagnostic possibilities. Rank this list in order of most to least likely and explain how it is possible to differentiate between these diseases. (9 marks)

You decide, on clinical grounds, that this is likely to be a case of salmonellosis.

- c) Explain how this condition can be confirmed, including the limitations of any suggested diagnostic techniques. (5 marks)
- d) Briefly discuss the epidemiology of salmonellosis in a herd of adult dairy cattle. Contrast the difference in epidemiology between **two (2)** of the more common salmonella serotypes. (5 marks)
- e) Describe how you would treat this cow and provide justifications for your treatment procedures. (5 marks)
- f) Discuss the measures that you would suggest to control the spread of the disease within the herd and any potential zoonotic considerations. (5 marks)

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5. You are called to examine an ongoing lameness issue in an 800-cow, year-round calving herd in northern Victoria. The production system is predominantly pasture-based, supplemented by feeding concentrate each milking in the milking parlour. The cows are fed 1.8 tonnes of concentrate per cow per annum.

The farm manager reports that his farm staff are treating, on average, 8–10 lame cows per week. The farm manager wants advice to effectively reduce the number of lameness cases.

Answer **all** parts of this question:

- a) Describe an acceptable approach to the investigation of this problem. *(10 marks)*
- b) Identify the common causes of foot lameness likely to occur under this production system. Briefly discuss the expected lesions and discuss the factors that can increase the development of **each** of these types of lameness. *(10 marks)*
- c) Describe the recommended control measures for the **four (4)** most common causes of foot lameness in this scenario. *(10 marks)*

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6. You are contacted by a dairy farmer in the Bega area of New South Wales. Her herd's bulk milk cell count (BMCC) is above 250,000 cells per mL for much of the year, so she is not receiving the BMCC premium payment. She says that she only has a small number of cases of clinical mastitis.

She wants you to investigate her problem and to provide recommendations to improve the cell count in her herd. As part of your investigation into this problem, you decide that it is necessary to undertake a milking time visit.

Thirty (30) aseptically collected composite milk samples were collected from high-cell-count cows. The laboratory reported that the samples yielded:

Twelve (12) cases of *Streptococcus uberis*

Two (2) cases of *Staphylococcus aureus*

Two (2) cases of *E. coli*

Nine (9) cases of no growth

Five (5) milk samples were contaminated

The milking machines have been tested by an accredited technician within the last week and the results are available to you.

For your milking management visit, describe:

- a) The aim of this milking time visit. (13 marks)
- b) The tools/pieces of equipment that you would like to have available for use at this visit. (4 marks)
- c) In detail, the components of your milking management visit. (13 marks)

**End of paper**