INTERNAL STUDENTS ONLY

EXAMINATION PAPER
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FROM ROOM

Student Name: _____

Student Number: _____

Signature: _____

The University of Queensland
Second Semester Examination, November 2001

ANIM3028
VETERINARY NUTRITION II

(BVSc STUDENTS ONLY)

Time: One (1) hour for working
Ten (10) minutes for perusal

All questions to be answered

Indicate your answer for each question by marking one of the five categories (a, b, c, d, e) on the answer sheet. Mark one category only. Do NOT place your answer on the paper)

PASTURE EXAM

1. **Which one of the following statements is correct?**
   (a) The number of beef cattle in Australia is approximately 2.6 M
   (b) The number of beef cattle in Australia is approximately 140-165 M
   (c) Native grasses and shrubs comprise over 90% of Australian grazing lands
   (d) Improved pasture supports less than 10% of livestock in Australia
   (e) The large area of native pasture in Australia underpins our beef supply into the European market

2. **Check this Q. Which is correct? Humid and subhumid rangelands or savannas are characterized by:**
   (a) <7.5 months dry season, <500-700mm rainfall p.a., irregular burning
   (b) <7.5 months dry season, >500-700mm rainfall p.a., regular burning
   (c) >7.5 months dry season, >500-700mm rainfall p.a., regular burning
   (d) <7.5 months dry season, 500-700mm rainfall p.a., regular burning
   (e) <7.5 months dry season, 500-700mm of rainfall p.a., irregular burning

3. **Which of the following statements is correct?**
   (a) Southeast Asia has small areas of permanent pasture and therefore very few large ruminants
   (b) Southeast Asia has small areas of permanent pasture but significant numbers of large ruminants
   (c) Southeast Asia has large areas of permanent pasture and significant numbers of large ruminants
   (d) Southeast Asia has large areas of permanent pasture but few large ruminants as they prefer sheep and goats
   (e) India has many large ruminants, but also has very large areas of permanent pastures

4. **Which native pasture community is the major cattle producing region of Queensland?**
   (a) The tropical and subtropical tall grass areas
   (b) The mitchell grasslands
   (c) The mulga woodlands
   (d) The spinifex grasslands
   (e) The monsoon tallgrass areas

5. **Which native pasture community in Queensland do you the associate with the species:-** ***Heteropogon, Bothriochloa, Themeda, Aristida*****?**
   (a) The tropical and subtropical tall grass (spear grass communities)
   (b) The mitchell grasslands
   (c) The mulga woodlands
   (d) The blue grass areas
   (e) The monsoon tallgrass areas

6. **The main grass tribes of the world are (a) Agrosteae, (b) Andropogoneae, (c) Aveneae, (d) Eragrostideae, (e) Festuceae, (f) Paniceae, and (g) Other minor tribes. Which are the main sources of tropical grass species for livestock production?**

(a) All of the above groups

(b) Tribes (c) and (e)

(c) Tribes (b) and (f)

(d) Tribes (a) and (b)

(e) Tribe (d)

7. **Which of the following characteristics applies to the clay soils of the astrebla grasslands ?**

(a) Infertile, low water storage, high erosivity

(b) Infertile, low water storage, low erosivity

(c) Fertile, average water storage, high erosivity

(d) Fertile, average water storage, low erosivity

(e) None of the above

8. **The *Imperata* grassland community found in many parts of Papua New Guinea (kunai grass in PNG, called blady grass in Australia) and Indonesia, is there because:**

(a) It was introduced for cattle raising during the 60s

(b) It evolved as a naturally occurring grassland community many centuries ago.

(c) The farmers cultivate it for its value as thatch

(d) Slash and burn agriculture followed by regular fires ensure its persistence

(e) No other species is as well adapted to the soils and climate

9. **Using the growth index concept, the poor growth of *Heteropogon contortus* (spear grass) in southern Queensland in winter, is primarily limited due to:**

(a) Low radiation index,

(b) Low temperature index

(c) Low water index

(d) Low temperature and water index

(e) The combination of low radiation, low water, and low temperature indices.

10. **The major ecological influence on Australian rangelands after European settlement was:**

(a) Increased marsupial populations due to discovery of artesian water

(b) Decreased marsupial populations due to slaughter by pastoralists

(c) More evenly distributed grazing by cattle and sheep due to discovery of artesian water.

(d) Increased grazing pressures due to introduction of cattle and sheep and less frequent burning

(e) Increased grazing pressures due to introduction of cattle and sheep and more frequent burning

11. **Which of the following best explains the grazier practice in Queensland of burning native pastures?**

(a) It is the best way to control many woody weeds in pastures

(b) It is not practiced as it exposes soil to erosion.

(c) It is not practiced as it destroys wildlife habitats

(d) It is not practiced as it results in loss of valuable nutrients which are volatilized during burning

(e) It removes unpalatable old grass growth but results in loss of native grass species

12. **When subjected to intensive grazing by cattle, *Themeda* grasslands (kangaroo grass) can be expected to:**

(a) Change to *Heteropogon* (spear grass), and then to *Aristida* (wire grass) dominance

(b) Increase in dominance because of its tolerance of grazing

(c) Remain unchanged as it is not very palatable

(d) Change to *Astrebla* spp. (mitchell grass) which is more resilient under regular grazing

(e) Change to *Cenchrus ciliaris* (buffel grass) which is better adapted to regular grazing

13. **Live weight gains of cattle grazing spear grass rangelands in northern Australia are likely to be in the range:**

(a) 50-90 kg/animal/year

(b) 200-250 kg/animal/year

(c) 150-200 kg/animal/year

(d) 250-300 kg/animal/year

(e) 90-150 kg/animal/year

14. **Live weight gains of cattle grazing native rangelands in northern Australia are regarded as:**

(a) Moderate, due to high summer rainfall and temperature which promotes abundant pasture growth

(b) Low, primarily due to seasonality of pasture production

(c) Low, primarily due to poor quality of pasture

(d) Low, due to both seasonality of pasture production and poor quality of pasture

(e) Low, primarily due to the poor palatability of native pasture species compared to exotic species

15. **Live weight gains of cattle grazing native rangelands in northern Australia can be increased by a number of strategies. Which strategy is <u>incorrect</u>?**

(a) Supply mineral supplement (N, P, S, Na) in winter when pastures are poorest

(b) Supply mineral supplement (N, P, S, Na) in summer when pastures are abundant

(c) Reduce tree cover to promote grass growth

(d) Augment native pastures with well adapted legumes

(e) Reduce stocking rates to improve opportunity for selection, and therefore increase diet quality

16. **Which of the following best completes the sentence? Instability of native grasslands in northern Australia is due to:**

(a) Overgrazing of fragile perennial grasses and the ingress of exotic weeds

(b) The introduction of exotic grass species which are invading native grass habitats

(c) Overgrazing of fragile perennial grasses and the ingress of native and exotic weeds

(d) Acidification of the native range due to exotic legumes introduced to improve pasture quality

(e) Conflicts among the many stakeholders e.g. indigenous, mining, pastoral and tourist interests

17. **Which of the following statements is accurate? Most tropical exotic grass species introduced to northern Australia:**

(a) Are well adapted to infertile Australian soils

(b) Have been introduced from East and Southern Africa

(c) Have been introduced from Central and South America

(d) Have become weeds in the Australian environment

(e) Are not able to survive the intensive grazing pressures common on beef properties

18. **Nitrogen is the most important nutrient for Australian pastures. The main source of N for tropical improved pastures in Australia is:**

(a) Fertilizer N applied to pastures

(b) Biological nitrogen fixation from legumes in pastures

(c) Mineralization of N in organic matter to plant available forms

(d) Nitrogen returned to the soil from the atmosphere during heavy rains

(e) All of the above are of similar importance

19. **Whilst you in the field, which of the following steps would give you the best indication of effective N fixation in a grass/legume pasture growing in a soil known to be very low in N?**

(a) Check to see that there is plenty of lush green legume growth

(b) Make sure that the legume used was a high N-fixing variety

(c) Make sure that the legume is well nodulated

(d) Check the pH of the soil to make sure that it is not too acid, and thereby limiting N-fixation

(e) Take nodule samples for laboratory checking to ensure that the rhizobium bacteria are effective strains for that particular legume

20. **The major reason for the introduction of exotic legumes into northern Australia was:**

(a) To provide much needed diversity in the diet of ruminants

(b) To increase the organic matter of Australian soils

(c) To offset the low Ca contents of tropical grasses, especially in the dry season

(d) To offset the low digestibility of grasses, especially in the dry season

(e) To increase the protein content in animal diets

21. **Tropical legumes have optimum temperatures for growth, nodulation and N fixation. Which of the following ranges is correct?**

(a) 15-20 °C

(b) 20-25 °C

(c) 25-30 °C

(d) 30-35 °C

(e) 35-40 °C

22. **Rhizobium bacteria and vesicular arbuscular mycorrhiza both form vital symbioses with legume plants. Which of the following statements is incorrect?**

(a) Rhizobium bacteria occur naturally in most soils and inoculation of legumes is unnecessary

(b) Mycorrhiza occur naturally in most soils and inoculation of legumes is unnecessary

(c) Legumes can take up P even if their roots are not infected with mycorrhizal fungi

(d) Legumes can take up N even if their roots are not nodulated with rhizobium bacteria

(e) Some legumes require specific rhizobium strains while others nodulate freely with naturally occurring rhizobium in the soil

23. **The main mechanism of nitrogen transfer to associated grass in well-grazed tropical legume pastures is via:**

(a) Excretion of soluble nitrogenous compounds from nodules

(b) Decaying nodular tissue

(c) The dung of grazing animals

(d) The urine of grazing animals

(e) All mechanisms are similarly important

24. **The amount of nitrogen fixed by legumes is influenced by the nutrient status of the soil. Which of the following statements is incorrect?**

(a) Al deficiency limits nodulation and therefore N fixation

(b) Al excess limits nodulation and therefore N fixation

(c) Mo and Co deficiency lead to N deficiency symptoms

(d) P plays a special role in nodule formation and N fixation process

(e) S deficiency affects N fixation and protein synthesis

25. **The balance of legume and grass in a mixed pasture is affected by management and climatic factors. Which of the following statements is incorrect?**

(a) Short term legume content can be increased by using a higher seeding rate for the legume.

(b) Application of fertilizer nitrogen will increase grass content at the expense of legume content.

(c) Severe defoliation will always lead to loss of tropical legumes from the pasture.

(d) P plays a special role in legume nutrition and usually results in increased legume content.

(e) Legume content varies seasonally.

26. The amount of ingested nitrogen retained by dairy cattle grazing pasture is approximately:

(a) 5-10%

(b) 15-25%

(c) 25-35%

(d) 35-45%

(e) 45-60%

27. The amount of effluent from intensive livestock systems is substantial and has become a major environmental problem. Which of the following is correct? In comparison to cattle feedlots, dairy sheds create:

(a) Greater odour of dairy effluent compared to feedlot effluent

(b) Greater accumulation of nutrients due to the higher quality diets of dairy cattle

(c) Greater accumulation of nutrients due to the concentration of nutrients from a large area of farm pasture

(d) Greater accumulation of nitrogenous wastes due to higher protein quality of dairy diets

(e) None of the above

28. Exotic pasture species are important in northern Australian pastoral industries. Which of the following is correct?

(a) Most successful tropical legume species originated from either Europe, North America or New Zealand

(b) Legumes have been planted over smaller areas than grasses, and relatively uniformly along coastal and sub-coastal regions of Queensland, but not further inland

(c) Grasses have been planted relatively uniformly along coastal and sub-coastal regions of Queensland, but not further inland

(d) Because of the importance of legumes, there have been greater areas of legumes planted than grasses

(e) Grasses with their shallow root systems have been less successful than legumes in drier regions

29. Which of the following statements about exotic pasture legumes in northern Australia is correct?

(a) Centurion centro (*Centrosema pascuorum*) is suitable for grazing, but not for hay making

(b) Shrubby stylo (*Stylosanthes scabra* cv. Seca) is resistant to anthracnose, and is especially suitable to the heavy clay soils and cooler temperatures common on the Darling Downs of southern Qld.

(c) Round-leaf cassia (*Chamaecrista rotundifolia*) grows well on free draining infertile soils, but is especially appreciated for its highly palatability

(d) Leucaena (*Leucaena leucocephala*) is a highly nutritious legume, but it has limitations as a feed for ruminants because of its high mimosine content

(e) American jointvetch (*Aeschynomene americana*) is vigorous in low fertility soils of the tropical coast, and is one of the few tropical legumes that tolerates water-logging

30. Which of the following statements about exotic pasture grasses in northern Australia is <u>incorrect</u>?

(a) Buffel grass (*Cenchrus ciliaris*) is a hardy, drought tolerant grass, suitable for the large areas of the more fertile soils in subhumid Central Queensland

(b) Signal grass (*Brachiaria decumbens*) responds to high fertility

(c) Setaria (*Setaria sphacelata*) is a tall-growing grass, suitable for the subtropics, but becomes very stemmy when mature

(d) Guinea grass (*Panicum maximum*) is a tall clump grass, for good soils, and combines well with twining legumes

(e) Purple pigeon grass (*Setaria incrassata*) likes good soil fertility, and is one of the few grasses that can establish easily on heavy black soils, and is very palatable

31. Which of the following pasture grasses has weed potential in tropical wetlands?

(a) Chloris gayana

(b) Setaria sphacelata

(c) Panicum maximum

(d) Brachiaria decumbens

(e) Hymenachne amplexicaulis

32. Which of the following pasture legumes is most widely planted in northern Australia?

(a) Stylosanthes scabra (shrubby stylo)

(b) Trifolium repens (white clover)

(c) Leucaena leucocephala (leucaena)

(d) Macroptilium atropurpureum (siratro)

(e) *Centrosema pascuorum* (Centurion centro)

33. The linear stocking rate model has been used to assist interpretation of stocking rate experiments. Using the equation: $y = 150 - 150x$, where y = liveweight gain per head (kg) and x = stocking rate (beasts / ha), what is the stocking rate at maximum gain per ha:

(a) 0.25 b/ha

(b) 0.5 b/ha

(c) 0.75 b/ha

(d) 1.0 b/ha

(e) 2.0 b/ha

34. Using the linear model above, the maximum gain per ha is:

(a) 15 kg/ha

(b) 37.5 kg/ha

(c) 50 kg/ha

(d) 75 kg/ha

(e) 150 kg/ha

35. **When interpreting the stocking rate model, which of the following is correct?**

(a) The model does not work well at very low stocking rates

(b) The model does not work well at very high stocking rates

(c) The value "a" represents the decline in weight gain as stocking rate increases

(d) The value "b" represents the quality of the pasture at very low stocking rate

(e) It provides a mathematical method for calculating optimum stocking rate

36. **Dairy farms in southeast Queensland endeavour to provide year round feed supply to their cows to maintain milk supply. Which of the following is <u>incorrect</u>?**

(a) Milk supply is lower in winter as low temperatures limit pasture quality

(b) Milk supply is lower in summer as high temperatures cause discomfort to cattle

(c) Milk supply is lower in summer as high temperatures limit pasture quality

(d) Dairy farmers feed grain supplement at all times of the year, even when pasture quality is high

(e) Queensland has lower average milk production compared to southern states because of need to feed tropical species in summer

37. **Which of the following is correct? Fodder conservation is practiced on Queensland dairy farms because:**

(a) There is opportunity to conserve summer surplus for winter feeding

(b) It is possible to take a single cut of ryegrass in late spring after flowering when weather is warm and dry, and obtain both high yields and high quality hay

(c) In general, there is a trade-off between quantity and quality when considering the best time to conserve fodder.

(d) Ryegrass silage and lucerne hay are excellent options to solve the autumn feed supply gap

(e) All of the above

38. **The important principles guiding grazing management are as follows. Which is <u>incorrect</u>?**

(a) Farmers should manage pastures to meet livestock feed requirements for different classes of stock

(b) Good management of pastures can eliminate the deleterious effects of high stocking rates

(c) Farmers should separate different types of pastures and match them to stock requirements

(d) Pasture should be managed to maintain a desirable botanical composition

(e) High stocking rates can be used to reduce opportunity for diet selection

39. **Cell grazing has increased in popularity because of the following claims. Which is <u>incorrect</u>?**

(a) The system increases the utilization of pastures

(b) There is reduced opportunity for selection of species

(c) Pastures are given a long rest period for recovery

(d) Desirable botanical composition is maintained

(e) The costs of maintaining the system are lower