28/11/2011

UNIVERSITY OF RUHUNA

FIRST EXAMINATION IN B.Sc AGRICULTURE: PART II

ANIMAL NUTRITION AND FEEDING (AS 1201)

THEORY PAPER

NOVEMBER 2011

TIME: TWO AND HALF HOURS

INDEX NO.....

ANSWER ALL (5) QUESTIONS

Question No	First marking	Second marking
1		
2		
3		
4		
5		
Total		

1.a. Give important advantages of feeding fibrous residues for ruminants

.....

.....

.....

.....

.....

b. Draw a flow chart to show conversion of carbohydrates to pyruvate in the rumen

c. What are the most essential nutrients to be supplemented when fibrous feeds are used as sole feed for ruminants?

.....

.....

.....

d. What are the main sources of glucose for the metabolism of ruminants?

.....

.....

.....

e. What are the possible sources for ruminants to get their amino acid and protein requirements?

.....

.....

f. What are the usefulness of non protein nitrogen to ruminants?

.....

.....

.....

g. "Most of the rumen bacteria have obligatory requirement for NH_3 for growth". Give three reasons to prove the given statement.

.....

.....

.....

h. What are the suitable conditions for the efficient conversion of NPN to microbial protein?

.....

.....

.....

.....

.....

i. What is By pass protein? Give three examples for by pass proteins. Give its importance for ruminants.

.....

.....

.....

.....

.....

2.a. What is meant by voluntary feed intake (VFI)?

.....

.....

.....

b. What are the main factors that influence the VFI?

.....

.....

.....

.....

.....

c. 400 Kg cow fed either average or very poor quality grass *ad libitum*

	TDN (%)	% LW	DM Kg/d	TDN Kg
a. Average quality grass	55	2.5	10	X
b. Very poor quality grass	45	1.5	6	Y
Increase (a Vs b)	A	B	C	D

Calculate X and Y (TDN intakes)

Calculate A, B, C and D

.....

.....

.....

.....

.....

.....

d. Draw flow chart to show the process of proximate analysis and give 3 shortcomings.

e. What is meant by feed processing? Give main methods of feed with example for each category.

.....

.....

.....

.....

.....

.....

.....

.....

.....

f. Give important factors which affect on socio economic and environmental acceptabioity of chemical treatment of animal feeds.

.....

.....

.....

.....

.....

.....

.....

g. What is total digestible nutrients (TDN)? Give special considerations, when calculating the TDN value.

.....

.....

.....

.....

.....

.....

h. What is meant by nitrogen balance?

.....

.....

.....

.....

.....

i. Draw a flow chart to indicate the fate of energy in the animal body

3..a). Giving suitable examples, define following terms

i. Protein concentrates (5 marks)

.....

.....

ii. Feed additives (5 marks)

.....

.....

iii Essential macro minerals (5 marks)

.....

.....

iv. Non essential amino acids (5 marks)

.....

.....

v. Anti-oxidants (5 marks)

.....

.....

b) Effects of four diets on broilers are given in Table

Diet	FCR (Feed:gain)	AME (Kcal/Kg)	Faecal moisture (%)	Viscosity of digesta	Rate of digesta passage (min)
1. Barley	1.73	2800			G
2. Barley + E_1	1.70	2900			H
3. Wheat	2.2		C	E	
4. Wheat + E_1	1.9		D	F	

i. What are the non starchy polysaccharides (NSP) present in wheat and barley (5 marks)

Wheat .....

Barley .....

Ii, What could be the feed additives denoted as (5 marks)

E_1.....

E_2.....

iii. Give relative values for C and D (5 marks)

.....>.....

iv, Give relative values for E and F (5 marks)

.....>.....

v. Give relative values for G and H (5 marks

.....>.....

vi. Explain as to why the AME of diet A is low compared to diet B (20 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

vii. Mention two more feed ingredients having NSP (10 marks)

.....

.....

viii. "Diet containing higher levels of NSP are not environment friendly" Comment on the above statement (20 marks).

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

4. a.

Compare following terms

i. Crude protein Vs true protein (5 marks)

.....

.....

.....

.....

.....

ii. True vs apparent digestibility (5 marks)

.....

.....

.....

.....

.....

iii. Faecal vs ileal digestibility (5 marks)

.....

.....

.....

.....

.....

.....

iv. Glucogenic vs ketogenic amino acids (5 marks)

.....

.....

.....

.....

b. Briefly explain the ideal protein (Ideal amino acid profile) concept. Mention the advantages the ideal protein concept in animal nutrition and feeding (30 marks).

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

c). An ideal protein of a particular species is given below

Amino acid	%
Lysine	100
Methinine	40
Cystine	50
Threonine	65
Tryotophan	15
Isoleucine	40
Leucine	70
Histidine	25
Phenylalanine	40
Tyrosine	45
Valine	50

It has been decided to include 1.25% lysine in the diet

Calculate the amounts of each of the other amino acids (40 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

d). List out the importance of lipids as a nutrient in animal feeding (10 marks)

5. a). What do you mean by non essential macro minerals? (5 marks)

b) Name essential macro minerals required by all livestock species (10 marks)

c) List out the functions of Ca in livestock (10 marks)

.....

.....

.....

.....

d) Explain as to why the term "availability, instead of digestibility is used in mineral nutrition (15 marks)

.....

.....

.....

.....

.....

e). "Even though the mineral requirements of mono-gastric animals can cheaply be met by giving feeds based on plant origin, the above practice has severe negative impacts on environment"

Comment on above statement (25 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

f). List out feeding strategies that can be adopted to overcome above problems (5 marks).

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

g. Considering the comparative digestive physiology and metabolism of cattle, poultry and swine, fill the following table. Write the appropriate answers and/or comparing word/s such as high, low medium, can, cant, easy, not easy, difficult, and not relevant in each cell. (see the example given in italic bold) (30 marks)

Aspect	Species		
	Cattle	Swine	Poultry
Energy system/s used in ration formulation	***TDN, ME***	***DE, ME***	***ME***
Ability to utilize P of plant origin	***high***	***medium***	***low***
Protein system/s used in ration formulation			
Ability to utilize arabinoxylans			
NPN utilization capacity			
First limiting amino acid			
Heat increment associated with digestion			
Ability to change the nature of body fat by altering dietary fat			
Utilization efficiency of dietary energy			
Feed energy loss as methane			
Phosphorus concentration in faeces			
Ability to utilize fibrous feed			