UNIVERSITY OF KWAZULU-NATAL
SCHOOL OF AGRICULTURAL, EARTH & ENVIRONMENTAL SCIENCES
DISCIPLINE OF ANIMAL AND POULTRY SCIENCE
EXAMINATION: 05 NOVEMBER 2013
SUBJECT, COURSE & CODE: INTRODUCTION TO RUMINANT NUTRITION ANSI312

DURATION: 3 HOURS **TOTAL MARKS: 100**

External Examiner: DR. MARION YOUNG
Internal Examiner: PROF IV NSAHLAI

NOTE: THIS PAPERS CONSISTS OF 2 PAGES, PLEASE SEE THAT YOU HAVE THEM ALL.

Answer **ALL** questions. *You are reminded of the necessity for good English, legibility and orderly presentation of material in your answers.*

QUESTION ONE [25]

i. There is scarcity of milk for household consumption in low resource production systems in rural Africa where milk replacers are not affordable. Suggest and justify fully a calf feeding strategy for this type of production system from calving to weaning [16].
ii. Write short notes on two named glands prior to the pylorus [9].

QUESTION TWO [25]

Table 1: Energy values are in MJ/kg DM of feed.

Animal	Food	Gross energy	Energy loss in		
			Faeces	Urine	Methane
Fowl	Barley grain	18.5	4.9	-	-
Sheep	Barley grain	18.5	3.0	0.6	2.0
Sheep	Dried ryegrass (young)	19.5	3.4	1.5	1.6
Sheep	Dried ryegrass (mature)	19.0	7.1	0.6	1.4

Use the table above to:

i. Calculate the digestibility of energy in feeds [2];
ii. Calculate the metabolisable energy value of feeds [2];
iii. Identify and discuss two factors that affect the metabolisable energy value of a feed [4];
iv. With reference to sheep, suggest and substantiate one strategy that could be used to increase the metabolisability of barley [2];
v. Name an anti-nutritional factor in barley [1].
vi. What further information is required in order to estimate the net energy value of a feed? [1].
vii. What further information is required in order to estimate the effective energy value of a feed? [5]
viii. Explain why the efficiency of use of ME is higher for maintenance that for production [4]
ix. Explain why sheep can use ME in barley grain more efficiently than ME in mature grass [4].

QUESTION THREE [25]

Ruminants are known to feed on grass rich in structural carbohydrate because of the presence of the rumen.

a) State four important factors involved in the digestion of structural carbohydrates [8].
b) With the aid of a flow diagram, give a detailed description of the digestion of fibre in ruminants. [17].

QUESTION FOUR [25]

i. Explain why some amino acids are said to be essential [1].
ii. List 6 essential amino acids [3].
iii. Identify various components (molecules) of feed carbohydrate [3].
iv. Name four fat soluble vitamins and state one function of each [8].
v. At what point is it necessary to do feed microscopy? [2].
vi. Give at least one recipe of a urea-molasses block for feeding ruminants during winter [3].
vii. What is nutritional secondary hyperparathyroidism? (5).

********** **Good luck!**********