2nd SEMESTER 2010/2011

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

PROGRAMME: BSc. ANIMAL SCIENCE III,

BSc. ANIMAL SCIENCE DAIRY OPTION II,

COURSE CODE: AS 308

TITLE OF PAPER: RESEARCH METHODS

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER <u>ANY FOUR</u> QUESTIONS

THIS PAPER MAY NOT BE OPENED UNTIL THE CHIEF INVIGILATOR HAS GRANTED PERMISSION

1. You are consulted to design an experiment to determine the effect of three diets (A=14% CP; B=16% CP and C=18% CP) on the liveweight of six week old broilers. You are also requested to study the effect of including a probiotic (10 parts per million) and to determine if there is a significant interaction between CP content and the probiotic on the six week weights. You have 1000 day old sexed chicks (500 male chicks in one box and 500 female chicks in another box). You only have enough feed and experimental housing for 960 broilers. The birds will be housed in 24 similar pens. The experiment must be replicated once with a total of 480 birds per replication.

   Answer the following question:

   a) What are the experimental factors in this study? (4)
   b) How many treatments are there in this experiment? (2)
   c) Outline how you will choose the sample of 288 chicks from the 600 (6)
   d) Describe how you would distribute the chicks and treatments in this experiment. (10)
   e) What type of experimental design is this? (3)

2.
   i). Briefly define the term research (4)
   ii). List five reasons for carrying out research (5)
   iii). Discuss applied research being sure to define and provide at least one example of this type of research (8).
   iv). List two possible sources for a research topic (2)
   v). List and briefly explain the first three steps of the scientific method (6)

3.
   a) Define the following terms?
      • A hypothesis (2)
      • A scientific theory (2)
      • Nominal numbers (1)
   b) Research may be based on experimentation, on opinions or it may be observational. Briefly discuss the experiment based type of research (4)
   c) Basic research is of no value. Briefly discuss this statement (6)
   d) Using an illustrative example, describe the process of stratified random sampling. (6) State two advantages and two disadvantages of this sampling procedure (4)

4.

a) Discuss sampling bias. (9)

b) A student at UNISWA, Luyengo performed the following experiment. Five mature male goats were feed diet (A) containing 120 g/kg crude protein for fourteen days. The first seven days were for adaptation. Faecal excreta was collected over the remaining seven days and the dry matter (DM) digestibility determined from each goat. The goats were then switched onto diet (B) and the process repeated. The digestibility values are presented in the table below:

Goat	Digestibility g/kg DM	
	A	B
1	550	730
2	600	750
3	580	700
4	530	650
5	620	600

i). What is this experimental design? (2)

ii). What is the main advantage of this experimental design? (2)

iii). Based on the output below lay out a statistical analysis protocol and draw a conclusion. (12)

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STATISTIX FOR WINDOWS

SUM OF THE DIFFERENCES  -110.00
          STD ERROR     34.351
          LO 95% CI    -205.37
          UP 95% CI    -14.626
          T             -3.20
          DF             4
          P              0.0164

          CASES INCLUDED 5    MISSING CASES 0
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5.

a) Using an illustrative example define the terms population and sample (8)

b) List and briefly discuss four reasons for using samples when carrying out research (8)

c) Illustrate the concept of sampling error using a hypothetical example. (8)

d) Suggest one approach that can be used to minimized sampling error. (1)