

SCHOOL OF AGRICULTURAL SCIENCES

MID –YEAR HALF COURSES 2013/2014

1. AGA 412/413 – Pig and poultry production
2. AGA 542 - Animal health
3. AGA 2022
4. AGE -572 – Agricultural policy analysis
5. AGF 522 – technology and fermented products
6. AGG 6132 – Soil plant water relations
7. AGS 522 – Soil and plant analysis



**UNIVERSITY OF ZAMBIA
SCHOOL OF AGRICULTURAL SCIENCES
ANIMAL SCIENCE DEPARTMENT**

2012/2013 ACADEMIC YEAR SECOND SEMESTER SUPPLEMENTARY EXAMINATIONS

COURSE AGA 412/4312: PIG AND POULTRY PRODUCTION

DATE OF EXAMINATION: 15th OCTOBER, 2013

TIME ALLOWED: THREE (3) HOURS

TOTAL MARKS: 100

INSTRUCTIONS TO CANDIDATES:

- i. Answer all questions.**
 - ii. Marks for each question are as shown.**
 - iii. Write the answers for each Section in separate answer books and mark books appropriately as Section A, B or C.**
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SECTION A POULTRY PRODUCTION

Q1. Commercial poultry producers look forward to purchasing high quality chicks for their enterprises. Write on the facilities required in a commercial hatchery and their significance in ensuring successful hatching of incubated eggs.

(15 marks)

Q2.

- a.** Distinguish a poultry breed from a commercial poultry strain and a commercial hybrid strain.
(6 marks)
- b.** Imagine you are the Animal Production Officer for an Organization for Widow Empowerment. A group of women come to you for guidance on how

to manage 1000 broiler chicks from ‘day old’ to marketing age. The chicks are due to arrive in two weeks’ time. What advice would you give them?

(14 marks)

Q3. Write on the constraints to the improvement of village chicken production in Zambia.

(20 marks)

SECTION B PIG PRODUCTION

Q1 Good record keeping is essential for good management and selection of good breeding stock on a pig farm. Apart from identification records, name three essential records and explain their importance.

(15 marks)

Q2 One of the requirements for efficient slaughtering of pigs is “pre-slaughter care”. Describe how pigs should be handled both at the farm and at the abattoir before slaughter.

(15 marks)

SECTION C ORGANIC PIG PRODUCTION

Q1 You are the new inspector certifying organic pig production in Kanakantapa. You have come to do a standard inspection of Mr Phiri’s organic animal husbandry programme.

(15 marks)

- Detail him on the main activities you would cover with him on this inspection.
- Briefly enlighten him on requirements of housing for organic pig production.

Or

- Enlighten him on the recommended origin of animals for organic production and conversion period.

END OF EXAMINATION

UNIVERSITY OF ZAMBIA
SCHOOL OF AGRICULTURAL SCIENCES
DEPARTMENT OF ANIMAL SCIENCE
2012 ACADEMIC YEAR SECOND SEMESTER
SUPPLEMENTARY EXAMINATION

AGA 542: ANIMAL HEALTH

TIME: THREE HOURS

INSTRUCTIONS:

1. Please read the instructions and each question carefully.
 2. Answer ALL questions.
 3. Write the answers to each question in a separate examination answer book.
 4. All questions carry equal marks.
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1. Diseases caused by helminthes (worms) are a major cause of reduced livestock production in most parts of Zambia though less attention is given to their control.
 - a) **List three (3) major groups of helminths. (3 marks)**
 - b) **Give one (1) example of each helminth group. (3 marks)**
 - c) **Outline a typical life cycle of each of the three groups of helminthes. (12 marks)**
 - d) **Outline two (2) general methods of controlling helminth parasites. (2 marks)**

2. You are the Livestock Officer in Sesheke. It is towards the end of December and a farmer calls you to his farm complaining of suddenly losing several animals which did not show signs of being sick previously. At the farm, you find some sick animals showing the following clinical signs: dullness, reluctance to move, respiratory distress and serous nasal discharge, edematous swelling from neck to brisket region and congested mucous membranes. Use the following questions to help you discuss the situation on the farm:
 - a) **What is your tentative diagnosis? (2 marks)**
 - b) **What is your differential diagnosis? (4 marks)**
 - c) **How can you confirm your diagnosis? (4 marks)**
 - d) **How is this condition transmitted? (4 marks)**
 - e) **What control measures would you suggest to prevent further outbreaks? (6 marks)**

3. You are appointed as animal health coordinator of an NGO formed to promote livestock production in the newly established Muchinga Province. One of the leading farmers, Mr Julius Sata, calls you to attend to his herd of cattle experiencing an outbreak of what he calls a “strange disease.” When you get to his farm, you confirm the outbreak of the disease characterised by Raised, circular, firm, coalescing nodules on head, neck, udder, perineum, legs and cores of necrotic material. Most animals have rhinitis, conjunctivitis and show signs of lameness.

- a) What is your tentative diagnosis? **(2 marks)**
 - b) List three (3) differential diagnoses. **(6 marks)**
 - c) How would you confirm your diagnosis of the condition stated in (a) above? **(6 marks)**
 - d) How would you prevent occurrence of this disease on other farms? **(6 marks)**
4. Write short notes on any **four (4)** of the following **(5 Marks each)**
- a) The aetiology and clinical signs of East Coast fever
 - b) *Rhipicephalus appendiculatus*.
 - c) Measures of the effects of disease on livestock production.
 - d) Livestock movement control.
 - e) Indirect costs associated with infestation of cattle by ticks.
5. Mr Victor Mwala, a poultry farmer near Lake Tanganyika, calls you to his farm. He has lost almost all his point-of-sale broiler flock over a period of 48 hours. When you get to the farm, you examine the few surviving and very sick birds and you record the following signs: coughing, sneezing, rales, lacrimation, ruffled feathers, diarrhoea, swelling of the head/face region, severe haemorrhages of bird feet and nervous symptoms. Briefly discuss the following:
- a) Your tentative diagnosis. **(2 marks)**
 - b) Your differential diagnosis. **(4 marks)**
 - c) How you can confirm your tentative diagnosis. **(4 mark)**
 - d) Transmission dynamics of this condition. **(6 marks)**
 - e) Control measures against the condition. **(4 marks)**

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END OF EXAMINATION



**THE UNIVERSITY OF ZAMBIA
SCHOOL OF AGRICULTURAL SCIENCES
DEPARTMENT OF ANIMAL SCIENCE**

AGA 2022 SUPPLEMENTARY EXAMINATIONS

INSTRUCTIONS: ANSWER ALL QUESTIONS.

ANSWER EACH SECTION IN A SEPARATE BOOKLET

BEGIN EACH QUESTION ON A NEW PAGE

SECTION A

1. The cell is said to be a basic unit that makes up all tissues, organs and systems hence the properties of the cell are equated with those of life. List down the cell properties and give a brief account on three of the listed cell properties. (25 Marks)
2. Write short notes on the following
 - a) Resting potential
 - b) Active potential
 - c) Depolarisation
 - d) Pinocytosis(25 Marks)

SECTION B

3. Define three forms of sensible heat flow. What principle facilitates this heat flow? (10 Marks)
4. Describe the effects of high ambient temperature on the following;
 - a) Food and water intake
 - b) Reproduction in male and female domestic animals
 - c) Growth(10 Marks)
5. With regard to animal reproduction, state one function of luteinising hormone each in male and female animals. (5 Marks)

END OF EXAM AND GOODLUCK!

**THE UNIVERSITY OF ZAMBIA
SCHOOL OF AGRICULTURAL SCIENCES
2012/13 ACADEMIC YEAR SECOND SEMESTER
SUPPLEMENTARY FINAL EXAMINATIONS**

AGE 572: AGRICULTURAL POLICY ANALYSIS

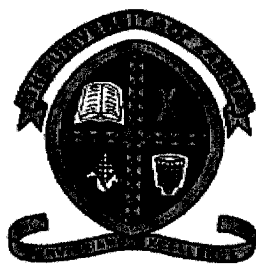
TIME: THREE HOURS

INSTRUCTIONS: Answer all questions

1. a) The allocation of scarce resources among alternative end uses is a basic problem facing all sectors of the economy including agriculture. With the use of a diagram explain the implications of choices of allocation for an economy producing only wheat and rice elaborating on the following:
- i) the role of prices in solving the problem of efficient allocation of resources;
 - ii) the possible effects on prices as a result of changes in consumer tastes say in favour of rice;
 - iii) the use of the diagram in helping to shed some light in explaining the meaning of economic growth and the possibility of increasing per capita income in LDCs.
- (14 marks)
- b) You have been employed as an economist in the Ministry of Agriculture and Livestock and you are tasked to offer advice on how to arrive at a policy position. Explain and illustrate by use of a diagram your understanding regarding the definition of policy and your advice regarding the basic framework/approach that should form the basis for the determination of policy position in the agricultural sector. (6 marks)
2. a) In explaining a typical case of pecuniary externalities, use a diagram and examples to describe the market failure that occurs when there is technological externality (i.e. a non-market spill-over). Elaborate on the economics of this type of failure as well as the correction of the externality. (10 marks)
- b) The Bank of Zambia recently effected the rebasing of the Zambian currency, the Kwacha, this year while the Minister of Local Government and Housing also recently effected the ban of manufacture, importation, distribution, stocking and sale of alcohol sachets (also commonly known as tujijiji):
- i) Contrast the nature and type of these two policy interventions (4 marks)
 - ii) Explain and discuss the implications of the implementation of the two policy interventions on the agriculture sector. (6 marks)

3. The Ministry of Agriculture and Livestock are interested in using the Policy Analysis Matrix (PAM) as a tool in policy decision-making process. You have been engaged as an economist to offer advice on the application of this approach:
- a) Explain briefly the pertinent issues to be considered concerning social prices for tradables when applying the PAM methodology. (10 marks)
 - b) Explain and discuss briefly why it is important to use PAM by citing the instances/situations when the PAM approach may be used. (10 marks)
- 4.
- a) A suggested redefined pricing role of Food Reserve Agency (FRA) could be one of guaranteeing and defending producer price floors and consumer price ceilings in order to perform this function more effectively. Explain and illustrate by use of a diagram how such a new, limited market function of FRA would work. You may make appropriate assumptions in your explanation if appropriate. (10 marks)
 - b) Outline and describe briefly five factors that have been advanced to underpin the relatively African countries' low level of market infrastructure development, compared to Asian countries and giving rise to the associated marketing inefficiencies and price spreads (10 marks)
- 5.
- a) It has been argued that basic research is almost by definition a non-commercial activity since appropriability is expected to be low. Explain and illustrate by use of a diagram why this is so. (12 marks)
 - b) "Public and private sector research can thrive side by side". Comment and elaborate on the substitutability and complementarity between public and private sector research. (8 marks)

END OF EXAMINATION



**UNIVERSITY OF ZAMBIA
SCHOOL OF AGRICULTURAL SCIENCES
DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY**

**2012/13 ACADEMIC YEAR SECOND SEMESTER
SUPPLEMENTARY EXAMINATION**

TECHNOLOGY OF FERMENTED PRODUCTS – AGF 522

TIME: THREE (3) HOURS

INSTRUCTIONS

**ANSWER ALL QUESTIONS.
EACH QUESTION CARRIES 25 MARKS**

1.
 - a. Describe and illustrate the processing of Acidophilus milk. **(7 marks)**
 - b. Mukupa Wesu Dairy Ltd approaches you with a problem of lack of flavour and aroma in their butter. With your vast knowledge in the technology of fermented products, explain the causes and possible solutions to this problem. **(8 marks)**
 - c. Discuss the role of sulphur dioxide in wine making and explain the changes that occur in yeast species during the course of fermentation. **(10 marks)**

2. Pickling is an important preservation method and can be used to preserve a variety of vegetable products. Sauerkraut is one of the many products that can be processed using this method.
 - a) Explain the processing of sauerkraut with the aid of the flow diagram. **(8 marks)**
 - b) How can you ensure that the final product is safe and of good quality? **(4 marks)**
 - c) Describe the microbial activity in each of the following stages during the fermentation of cabbage:
 - i. Initiation **(4 marks)**
 - ii. Primary fermentation **(4 marks)**
 - iii. Secondary fermentation. **(5 marks)**

- 3.
- a. Discuss the differences and similarities between Tempeh and Ontjom, and illustrate the manufacturing process for both products using flow diagrams. (10 marks)
 - b. Explain the influence of brine fermentation on the quality of Soy sauce. (10 marks)
 - c. Discuss the role of moulds in solid state fermentation and give an example of a product manufactured from dough fermentation. (5 marks)
4. You are watching the Champions League soccer game between Manchester United and Barcelona on television with your friend. A Guinness beer advert is shown at half-time and your friend tells you how much he like this beer.
- a. Explain the manufacturing process of this beer with the aid of flow diagram. (13 marks)
 - b. How does the process in a) differ from that of mosi lager beer. (3 marks)
 - c. Another one of your friends prefers a fruit beer, how can this be manufactured? (5 marks)
 - d. A brewer tells you that his beer lacks bitterness and aroma despite having used all the necessary ingredients. Diagnose the problem and give a possible solution. (4 marks)
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End of Examination

GOOD LUCK!!!!!!



UNIVERSITY OF ZAMBIA
UNIVERSITY SECOND SEMESTER EXAMINATIONS-JUNE, 2013

AGG 6132: SOIL PLANT WATER RELATIONS

Time: Three (3) Hours **Total Marks:** 100
Instruction: Answer all Questions
Non-programmable calculators are allowed

1. Briefly define each of the following terms (15 marks)
 - a) Void ratio
 - b) Harvest Index
 - c) Water stress coefficient
 - d) Hydraulic conductivity
 - e) Available water-holding capacity

2. With the aid of a diagram briefly describe four most important points on the soil water retention curve and how they are measured in the laboratory (15 marks)

3. With graphical illustration show why normalized water productivity function is preferred than just water productivity (10 marks)

4. AquaCrop simulates biomass and attainable yield in response to water stress in field crop production. Describe the major calculation scheme of the AquaCrop model in simulating attainable yield of a fully irrigated crop. (15 marks)

5. The crop yield is determined by a number of prevailing conditions during plant growth:
 - a) Explain the factors that determine the maximum yield (Y_m) of a crop (2 marks)
 - b) Explain how the gross dry matter production of a standard crop is determined using Wageningen method. Define each parameter and how is it determined (10 marks)
 - c) What are the major differences between the Wageningen and the Agro-ecological Zone methods in determining actual yield of a crop? (13 marks)

6. A soil column of 1m deep in the greenhouse has a wet bulk density of 1.7 g cm^{-3} and dry bulk density of 1.4 g cm^{-3} , calculate: (20 marks)
- a) Gravimetric moisture content (%)
 - b) Volumetric moisture content (%)
 - c) Air-filled porosity (%)
 - d) New air-filled porosity (%) if a 2 cm of irrigation is applied and penetrates to a soil depth of 25 cm
 - e) Volume of water in a hectare (i) mm/day and (ii) m^3/ha

End of Exam



UNIVERSITY OF ZAMBIA

SECOND SEMESTER SUPPLEMENTARY EXAMINATIONS – OCTOBER 2013

AGS 522: SOIL AND PLANT ANALYSIS

Time: Three (3) Hours

Marks: 100

Instructions: Answer all Questions

1. Briefly define the following terms [15 marks]
 - a. Soil test calibration
 - b. Diagnostic sampling
 - c. Dry ashing
 - d. Hidden hunger in plants
 - e. Nutrient antagonism

2. Answer the following questions briefly and concisely:
 - a. With the help of a diagram or graph, explain the different stages of the yield of a particular crop in relation to increase in nutrient supply from very low to very high level. [10 marks]
 - b.
 - i. Describe clearly any named method you know for analyzing Zn, Cu, Mn and Fe in soils [7 marks]
 - ii. Explain why molybdenum is rarely routinely determined as a micronutrient in the soil [3 marks]

3. Briefly discuss:
 - a. All the steps involved in the derivation of critical nutrient concentrations, including the pre-requisite steps [10 marks]

- b. Five points in the information usually requested from the farmer, which may be important for making fertilizer recommendations **[10 marks]**
 - c. Five different purposes for carrying out plant analysis **[10 marks]**
4. In the traditional Kjeldal procedure for determining total nitrogen, 1g of soil sample was digested and the digest then distilled. The distillate was collected in a conical flask containing 10 ml boric acid indicator, the mixture was then titrated with 0.01 M KCl and a volume of 3.5 ml was used to reach the end point. Assume the soil was collected from topsoil layer with a depth of 20 cm and a bulk density of 1.3 g/cm³, answer the following:
- a. Name the reagents and the catalyst used to digest the sample and describe the N conversions that take place during the digestion process **[7 marks]**
 - b. Calculate the total N content of this soil expressed in tons/ha **[10 marks]**
 - c. Explain how you would distinguish chlorosis due to low N and that due to low K. **[5 marks]**
5. Outline the major forms of sulphur in the soil and describe the main sources and the processes that may lead to its loss from the soil. **[13 marks]**