**ANIMAL HUSBANDRY**

1. **PREAMBLE**

The syllabus has been structured to assess candidates’ basic knowledge and skills in the production, processing, storage, packaging and marketing of farm animals and their products. It is also intended to assess the capability of the candidates to pursue further training at the tertiary

level.

2. **AIMS OF THE SYLLABUS**

The syllabus will therefore seek to assess candidates’ knowledge and skills in

(1) basic animal production practices such as feeding, housing, pest and disease control;

(2) the efficient and effective management of animal enterprises;

(3) the application of environmentally friendly practices to sustain production;

(4) the identification of basic problems hindering the improvement of the Animal Industry;

(5) the efficient processing, preservation, packaging, storage and marketing of animals and their products.

3.  **REQUIREMENTS**

1. Schools offering Animal Husbandry are expected to raise at least one species of farm animals from each of the following groups:

1. Monogastrics e.g. poultry, pigs, rabbits.

(b) Ruminants e.g. goats, sheep, cattle.

1. Non-traditional farm animals e.g. grasscutters,snails

2. It is recommended that the schools should have agriculture laboratories where specimens, equipment and chemicals would be kept.

3. It is also recommended that candidates keep practical notebooks which should contain records of activities undertaken and observations made on the school farm and on field trips and of specimens collected.

4. **EXAMINATION SCHEME**

*For candidates in Ghana only*

There will be three papers, Papers 1, 2 and 3, all of which must be taken. Papers 1 and 2 will be a composite paper to be taken at one sitting.

**PAPER 1:** Will consist of fifty multiple choice objective questions all of which must be

answered within 1 hour for 50 marks.

**PAPER 2:** Will consist of six essay-type questions. Candidates will be required to

answer four questions within 2 hours for 80 marks.

**PAPER 3:** Will be a practical paper for school candidates or a test of practical paper for

private candidates. The paper will consist of four questions all of which must

be answered within 2 hours for 60 marks.

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| **CONTENTS** | **NOTES** |
| A. INTRODUCTION TO  ANIMAL  HUSBANDRY  1. Meaning, scope and  importance of animal  husbandry  2. Problems in animal  production  3.Quality and Safety  standard of animal food  products  4. Classification of farm  animals  B. ANATOMY AND  PHYSIOLOGY OF  FARM  ANIMALS  1. Meaning of the terms:  anatomy, physiology  and the external  orientation of farm  animals  2. Digestive System  (a) Comparative  anatomy of digestive  system of farm  animals  (b) Digestion and  Absorption  processes in the  various classes  of farm animals  3. Central Nervous  System  (a) Parts of the Central  Nervous System  (CNS) and  Autonomic  Nervous System  (ANS)  (b) Functions of the  ANS  (c) Endocrine System  (i) Endocrine glands  and their functions  (ii) Hormones and  their functions  4. Integumentary, skeletal  and muscular systems  5. Reproductive System  (a) Anatomy of the  reproductive system  of poultry and  livestock  (b) Functions of organs  and parts of the  reproductive system  (c) Reproductive  processes  6. Circulatory System  (a) Structure and  functions  (b) Heart and Pulse  rate  7. Respiratory System  (a) Meaning and  Importance of  Respiration  (b) Structure and  Functions of the  Respiratory System  8. Excretory System  (a) Meaning and  Importance of the  Excretion  (b) Structure and  Functions of the  Excretory System  (c) Excretory Products  C. ANIMAL NUTRITION  1. Introduction to Animal  Nutrition  (a) Meaning and  Importance  (b) Modes of feeding  2. Feedstuffs and Feed  Supplements  (a) Types, composition  and functions of  the feed nutrients  (b) Classification of  feedstuffs  (c) Food tests  (d) Producers and  suppliers of  feedstuffs and  supplements  3. Formulation and  Preparation of Animal  Feeds   1. Common terms   used in feed  formulation   1. Factors considered   in the formulation of ration   1. Steps in the   formulation of ration  4. Handling and Storage of  Animal Feeds  (a) Importance of feed  storage and  features of  storage structures  (b) Factors that affect  the quality of stored  feed  5. Record keeping and  estimation of cost of  prepared feed  6. Pests of stored feed and  their control  D. ANIMAL HEALTH  1. Meaning of terms  2. Signs of good and ill-  health  3. Factors that pre-  dispose animals to  diseases  4. Effects of diseases,  pests and parasites on  animal production  5. Zoonotic diseases; their  importance and  prevention  6. Pathogens of farm  animal diseases  (a) Classification of  pathogens  (b) Pathogenic  diseases and their  economic  importance  (c) Principles for  prevention and  control of  diseases of farm  animals  (d) Management  practices in the  prevention and  control of diseases  of farm animals  7. Ectoparasites and  endoparasites   1. Types and   examples  of parasites  (b) Structure, life cycle  and mode of  feeding  (c) Conditions that  influence parasite  population  8. Prevention and control  of parasites  9. Economic importance  of parasites    E. GENETIC  PRINCIPLES AND  ANIMAL  IMPROVEMENT  1. Heredity, basic genetic  terms and Mendel’s first  law of inheritance  2. Meaning, objectives  and benefits of animal  improvement  3. Performance traits of  improved and  unimproved animals  4. Methods of animal  improvement;  advantages and  disadvantages  5. Nutritional and  environmental factors  affecting animal  improvement  6. Artificial Insemination  (a) Meaning and  process of  artificial  insemination  (A.I.)  (b) Advantages of  A.I.  (c) Signs of heat  (oestrus) and  handling  procedures in the  collection and  storage of semen  F. INTRODUCTION TO  ENVIRONMENTAL  PHYSIOLOGY  1. Internal and external  environment of animals  2. The role of the nervous  and endocrine systems  in homeostasis and  animal’s response to  stimuli  3. Determination of room  temperature, body  temperature and  respiration rate in farm  animals  4. Effects of climate on  farm animals  5. Modification of animal  environment and  management pratices to  reduce stress on  animals  G. MONOGASTRIC  AND  DOMESTIC PET  PRODUCTION  1. Poultry production  (a) Definition and  characteristics of  poultry  (b) Classes of poultry  (c) Breeds and types  of poultry  (d) Importance/role of  poultry production  (e) Systems of poultry  Production  (f) Incubation and  Hatchery Practices  (i) Terminologies  (ii) Natural and  Artificial  Incubation  (iii) Selection of eggs  for Hatching  (iv) Conditions  necessary for  hatching of eggs  (v) Incubation Process  (vi) Candling of Eggs  (vii) Marketing of day-  old chicks  (g) Management Practices  (h) Processing  and marketing  of Poultry  (i) Prospects of producing  the various types of  poultry  2. Pig Production  (a) Types, breeds and  characteristics  (b) Importance of pig  production  (c) Systems of  keeping pigs  (d) Management  practices  (e) Slaughtering,  processing and  marketing of pigs  3. Domestic Pets  (a) Meaning and  Importance of pets  (b) Management of pets  (c) Training of Pets  (d) Marketing of pets  (H) RUMINANT  PRODUCTION  1. Sheep and goat  production.   1. Common   Breeds,  Distribution and  Characteristics  (b) Importance of  sheep and goats  (c) Management  Practices  (d) Common parasites  and diseases and  their control  (e) Processing and  marketing  2. Beef Cattle Production  (a) Breeds and  characteristics  (b) Importance of  beef cattle  production  (c) Common  Production  Systems  (d) Planning,production  and management of  cattle for beef and  traction  e) General management  practices  (f) Processing and  marketing  (g) Major Problems in  beef cattle production  3. Dairy cattle production   1. Breeds and   features of dairy cow  (b) Characteristics,  sources and  importance of milk  c) Management practices  (d) Diseases and their  control  (e) Production, processing  and marketing of milk  and dairy products  (f) Problems of dairy  cattle production in  warm climates  I. RANGE AND  PASTURE  MANAGEMENT  1. Introduction to range  and pastures  (a) Basic  terminologies in  pasture and range  management  (b) Types of pasture  and their features  (c) Importance of  pastures and forage  crops in animal  production  (d) Factors that affect the  productivity of  different types of  pasture  (e) Major forage crops  (f) Poisonous plants in  pasture  2. Pasture establishment  and management  (a) Qualities of good  pasture and forage  species  (b) Establishment of  pasture  (c) Improving natural  Pastures  (d) Management of  cultivated pastures  (e) Harvesting of forage  crops  3. Forage conservation  and utilization  (a) Forage  conservation and  its importance  (b) Preparation of hay  and silage  (c) Utilization of crop  residue in feeding  animals  (J) NON-TRADITIONAL  ANIMAL PRODUCTION  1. Rabbit and Grasscutter  Producation  (a) Common breeds  (b) Importance of  producing rabbits  and grasscutters  (c) Manangement  Practices  (d) Processing and  Marketing  2. Snail Farming  (a) Meaning and  importance  (b) External features of  Snails  (c) Types of species  (d) Site selection  (e) Management Practices  (f) Processing and marketing of snails  (g) Establishing  enterprises in animal  husbandry  1. Breeds of  Farm Animals.  2. Classification of farm  Animals.  3. Anatomy and  Physiology of Farm  Animals.  4. Animal Nutrition  5. Main Pests and  Parasites of farm animals  6. Diseases of farm  animals; their  prevention  and control  7. Artificial Insemination  8. Environmental  Physiology  9. Management Practices  10 Animal Products  and By-products  11. Range and Pasture  Management  12. Animal Housing and  Structures | Knowledge of the meaning (rearing of farm animals), scope (nutrition, health, etc.) and importance (source of food, employment, income, etc) of farm animals are required.  Knowledge and understanding of the problems in animal production in West Africa and possible solutions to the problems will be assessed.  Description of the quality and safety standards of animal food products. Practices for maintaining standards, effect of consuming poor animal products and roles of agencies involved in the animal food products safety and quality will be assessed.  Classification based on;  1. **Digestive system**  (a) Ruminants e.g. sheep, goat, cattle  (b) Non-ruminants (monogastrics) eg.  poultry, pigs  (c) Non-ruminant herbivores e.g.  rabbits, grasscutter, guinea pigs.  2. **Concept of traditional**  (cattle, sheep, goat) **and**  **non-traditional farmanimals**  (rabbit, grasscutter, snails)**.**  Understanding of the terms anatomy and physiology; and knowledge of parts and positions of the various external parts (orientation) of farm animals e.g. the head of the cow is anterior to the hind limb or udder; will be assessed.  The main features of the digestive systems of ruminants, non-ruminant herbivores and monogastrics and the differences in structure and functions will be assessed.  Candidates’ understanding of digestion processes in the various classes of farm animals, the role of specific enzymes in the digestion of specific nutrients e.g. carbohydrates, proteins, fats and oils in farm animals, and the structures and processes involved in absorption of nutrients will be assessed.  Ability to identify the parts of the CNS and ANS and describe the mode of action of the CNS and ANS is required.  Knowledge of the functions of the ANS is required. The ability to explain how nerve impulses are transmitted and how homeostasis is ensured will also be assessed.  Knowledge of what endocrine glands are, their location in the body and functions will be assessed.  Hormones, their functions and mode of action, and understanding of the need to administer synthetic hormones will be assessed  The structure and functions of the integumentary (skin), skeletal and muscular systems will be assessed.  Understanding of reproductive terms e.g. puberty, oestrous cycle, oestrus/anoestrus, ovulation, fertilization, libido, etc will be assessed.  Knowledge of the main features of the reproductive system of poultry and livestock will be assessed.  Knowledge of the functions of the organs and parts of the reproductive system will be assessed.  The various stages in the reproductive process (from puberty through mating to parturition); differences between the reproductive processes in poultry and livestock will be assessed.  Knowledge of reproductive hormones and their functions is also required.  Assessment will be on the various organs of the system e.g. heart, blood vessels; tissues (blood, lymph) and cells (blood cells); and their functions.  Differences between pulmonary and systemic circulation will also be assessed.  Meaning of heart and pulse rate and the interpretation of their values will be assessed.  Understanding of the term respiration and its importance will be assessed.  The structure and functions of the parts of the respiratory system of livestock will be required.  Understanding of the term excretion and its importance is required  The structure and functions of the parts of the excretory system of livestock will be required.  Examples of excretory products and how they are eliminated from the body is required.  Understanding of the term nutrition and its importance/role in animal production e.g. improves body resistance, production level, etc. will be assessed.  Understanding of basic nutrition terms such as nutrients, diet, ration, roughages, malnutrition, concentrates, etc will also be required.  The differences in the various modes of feeding in non-ruminant herbivores, ruminants, carnivores and omnivores will be required.  The influence of the type of dentition on the mode of feeding of the animals will also be required.  Feedstuffs and supplements, their main composition and functions of the major nutrients will be required  Ability to group feedstuffs according to the major nutrients they supply will also be assessed.  Ability to use simple food tests to detect the presence of carbohydrates, fats and oils, proteins in feedstuffs is required.  Knowledge of major producers and suppliers of feedstuffs in the country is also required  Understanding of the common terms used in formulation such as dry matter, diet, metabolizable energy, malnutrition etc. will be assessed.  Factors considered in the formulation of rations e.g. age, physiological state of the animal, cost of feed ingredients etc. will be required.  Ability to use the Pearson Square Method to formulate a balanced ration is required.  Importance of feed storage and features of the various feed storage structures/containers will be required.  Factors which affect the quality of stored feed e.g. storage temperature/ambient temperature, humidity, water content, pests and rodents will be required.  Ability to follow procedures /practices in the handling of stored feed e.g. drying, fumigation, will also be assessed.  Ability to keep feed records and estimate the cost of prepared feed will be assessed.  Ability to identify common pests of stored feeds, the effects of pests on stored feed (e.g. damage, contamination), preventive and control measures of pests in feed will be assessed.  Candidates will be assessed on their  understanding of the terms: disease, pest and parasite.  Knowledge of the characteristics of healthy and sick animals and ability to describe the signs and symptoms of disease in farm animals will be assessed.  Understanding of the factors and how they predispose animals to diseases e.g. over crowding, poor nutrition, poor housing,  Causes of stress and measures to reduce stress in farm animals will be assessed.  Understanding of the effects of diseases, pests and parasites on the economic value of animals/ animal products and income e.g. reduced value/output, loss of income, reduced quality of products, will be assessed.  Understanding of the term zoonotic disease and its importance e.g. effect on human health and preventive methods will be assessed.  Knowledge of the various classes of pathogens (viruses, bacteria, fungi and protozoa)  Common pathogenic diseases and their economic importance in animal production will be assessed.  Principles for prevention and control of diseases (e.g. nutrition, vaccination, ) with respect to cost, suitability and efficiency;  Ability to use prophylactics (coccidiostat, anti-biotics, anti-stress drugs, vitamins) to control animal diseases will be assessed.  Practices such as deworming, dipping, dusting, treatment of wounds and sores, spraying and fumigation of animal houses, drug administration and precautions to be taken in the use of drugs for disease control will be assessed.  Knowledge of the two main types of parasites (ecto and endoparasites) and examples is required.  The structure, life cycle and mode of feeding of the common types of endo- and ectoparasites will be required.  Conditions that affect parasite population, and how they could be changed to reduce parasite population will be assessed.  Measures such as deworming, drenching, dipping, farm sanitation etc, the use of appropriate equipment and chemicals in the prevention and control of parasites will be assessed.  The economic importance of ectoparasites and endoparasites (i) on the host e.g. ectoparasites damage skin and hides, suck blood. Endoparasites damage internal organs  (ii) on animal products e.g. loss of income, increased expenditure due to control measures, etc. will be assessed.  Candidates will be assessed on their  understanding of heredity and associated genetic terms (e.g. gene, genotype, phenotype, sex-linkage) in animals, the processes of cell division (meiosis and mitosis) and inheritance of traits;  Mendel’s first law of inheritance of genes  Understanding of the term animal improvement and knowledge of the objectives and benefits of animal improvement e.g. disease resistance, better growth rate, will be assessed.  Ability to analyze data to determine superiority of improved animals based on genotype and phenotype will be assessed.  The different methods of animal improvement (introduction, selection, breeding), types of breeding (e.g. cross breeding, line breeding), advantages and disadvantages of the different methods of animal improvement will be required.  Nutritional and environmental factors that affect animal improvement will be assessed  Understanding of the term artificial insemination, the ability to describe A.I. technique and name of tools and equipment used in the process are required.  Advantages in the use of A.I. will be required.  Ability to detect heat in farm animals through knowledge of signs of heat and the proper handling procedures in the collection and storage of semen will be assessed  Candidates will be assessed on what constitutes the internal environment (e.g. blood glucose level, body temperature) and external environment (e.g. ambient temperature, humidity, wind) of animals and examples of acceptable levels of constituents of these environments  The role of the nervous and endocrine systems in creating environmental awareness in animals, their responses to stimuli and maintenance of homeostasis e.g. normal levels of body  Temperature  espiration; heart rate is required.  Knowledge of physiological and behavioural responses of animals to heat, cold, exercise, etc is also required.  Knowledge of equipment employed in the measurement of temperature, humidity, respiration rate, heart beat, etc. and the ability to use the equipment and interpretation of generated data are required  Indirect and direct effects of climate on farm animals (e.g. disease prevalence, feed quality and quantity, heat stress, increased abortion) will be assessed.  Understanding of the terms thermo-neutral zone and optimum temperature and their relation to animal productivity will be assessed.  Ways of modifying the environment e.g. provision of appropriate housing, shading, cooling; and management (e.g. better feeding, time of grazing, etc.) on improved animal productivity will be assessed. Strategies to minimize stress e.g. design and lay-out of houses, provision of cool water, modified feeds, proper timing of drug administration will also be assessed.  Candidates will be assessed on their understanding of the term poultry and knowledge of the characteristics of poultry e.g. possession of beaks, wings, feathers.  Knowledge of the different types of poultry e.g. chicken, turkey, ducks, Guinea fowls and ostriches will be assessed.  Knowledge of the breeds of the various types of poultry:  Chicken e.g Rhode Island Red, Plymouth Rock;  Guinea fowl e.g.Grey, Red-wattled (Pearl variety);  Turkey e.g. Broad Breasted Bronze:  Ducks e.g. Muscovy, Khaki Campbell;  Ostriches e.g. Blue Neck, Red Neck will be assessed.  The importance of the production of the various types of poultry will be assessed.  The various systems of poultry keeping and the advantages and disadvantages of the various production systems: extensive, intensive, semi-intensive systems will be required.  Understanding of terms such as fertile egg, hatchability, incubation and broodiness will be assessed.  Ability to describe and differentiate between natural and artificial incubation, the advantages and disadvantages of each method of incubation will be assessed.  Knowledge of the characteristics of eggs suitable for hatching and the ability to select them for hatching are required.  Knowledge of the incubation period of the types of poultry and the conditions necessary for hatching of eggs will be assessed.  Ability to describe the process of incubation and knowledge of hatchery practices that would ensure production of healthy chicks e.g. fumigation, temperature will be assessed.  Understanding of the process of candling of eggs is required.  Techniques and precautions for the marketing of day-old chicks will be assessed.  Management practices i.e. housing, breeding, brooding, feeding, sanitation, pest and disease control, identification, record keeping, etc. will be assessed.  Knowledge and understanding of the activities involved in the processing and marketing of poultry i.e. slaughtering and Processing, Quality Control, Packaging, Preservation and Storage, Marketing Outlets, transportation and advertisement will be assessed.  The prospects for keeping the various types of poultry, consumer preferences, market availability, cost etc will be assessed.  Candidates will be assessed on their knowledge of   1. Types of pig. i.e. bacon, lard and pork types 2. Breeds of pig e.g., Yorkshire, Ashanti   Black, Large White, Landrace, and  (iii) The characteristics of the breeds of  pig.  The importance of pig production to the economy i.e. source of employment, income, insulin used in pharmaceutical industries etc will be assessed.  Candidates’ understanding of and ability to describe the various management systems of pig production i.e. Intensive, Semi-intensive and Extensive systems will be assessed.  The advantages and disadvantages of each of the management systems will also be assessed.  The various management practices used in pig production e.g. breeding, housing amd feeding will be assessed.  Knowledge and techniques of slaughtering, processing and marketing practices, e.g. bacon making, quality control, packaging, storage, identification of marketing outlets, advertisements etc. will be assessed.  The meaning of the term ‘pet’; (e.g. cat, dog, parrot) and the important roles pets play in the society e.g. security, income, shepherding, companionship are required.  The management practices in the raising of pets such as housing, feeding, sanitation, breeding, grooming and care, pests and diseases and their control will be assessed. The importance of pet licencing and regular vaccination will be assessed.  Knowledge of animal behaviour and reasons for training of pets is required.  Marketing strategies and value chain process in the marketing of pets will be assessed.  The common breeds of sheep and goats and their geographical distribution will be assessed.  The distinguishing features between sheep and goats, as well as the characteristics of the breeds e.g. body size, nature of hair cover and horn shape will also be assessed.  The importance of sheep and goats i.e. Social e.g. religious; Economic e.g. income, hides and skin for leather etc; Nutrition e.g. meat for food etc. is required.  Production requirements using a value chain approach is required.  Management practices in the production of sheep and goats such as  hoof trimming, housing, feeding, sanitation, disease and pest control are also required. Ability to determine the age of sheep and goat by the dentition will be assessed.  Common parasites (ticks and worms) and diseases of sheep and goats e.g anthrax, mastitis, foot rot; signs/symptoms of infection and control measures will be assessed.  Techniques involved in the processing and marketing of sheep and goats to ensure meat quality, safety and consumer satisfaction including slaughtering and processing, quality control, preservation and storage, packaging, advertising and marketing outlets will be assessed.  Common breeds of beef cattle in West Africa and Europe; and the characteristics and general structure of breef breeds will be assessed.  The importance of beef cattle production i.e. nutritional value of beef, use of hides, horns, bones and manure, social and economic value of beef and live cattle will be assessed.  The common production systems of beef cattle e.g. Extensive, pastoral, agropastoral, semi-intensive, intensive feedlot,pastures), their characteristics and the strengths and weaknesses of each system will be  assessed.  The requirements, using value chain approach for producing beef cattle; selection of management system, foundation stock, and qualities of bulls and cows to be selected for traction will be assessed.  Skills in carrying out practices such as housing, feeding, breeding, fattening, etc. Knowledge of training of yoked cattle will be assessed.  Techniques of slaughtering and processing of carcass, maintenance of safety standards, packaging and sale of meat products will be assessed.  The negative effects of poor management of beef cattle on the environment, as well as problems of feed and water shortages, cattle theft ,pestsetc and their solutions will be assessed.  .  Examples of pure and cross bred dairy breeds in tropical and temperate regions; and the distinguishing features of dairy cow will be assessed.  Knowledge of the composition and nutritional value of fresh milk will be assessed.  Knowledge of sources of milk such as goats, sheep, buffaloes, camels and cattle and the importance of milk from dairy cattle including food, income,employment, trade etc. will be assessed.  The requirements, using a value chain approach, for producing milk from dairy cattle e.g. market demand for milk and dairy products, inputs for producing wholesome /healthy milk etc. Selecting suitable breeds and management systems will be assessed.  Knowledge of symptoms and methods of controlling mastitis, tuberculosis and ketosis is required.  Equipment and tools required for milking, milk handling and processing; pasteurization of milk; examples of products e.g. yoghurt, cottage cheese, tinned milk, powdered milk will be assessed.  (i) Knowledge of consequences of consuming contaminated milk will be assessed.  (ii) Knowledge in maintaining quality and safety standards in milk processing and marketing will be assessed. Knowledge of packaging,storage and marketing practices will also be assessed.  Effects of warm climate on dairy animals and milk production; and the solutions to the problems will be assessed.  Candidates will be assessed on their understanding of the basic terms in pasture and range management e.g. pasture, pasture rotation, stocking rate, range, forage crops  Types of pasture (natural/range and artificial/cultivated) and their features will be assessed.  The role of forage and pasture crops in animal production will be assessed.  The factors that affect the productivity of different types of pasture eg. rainfall, soil fertility, temperature, weeds, etc. is required  Knowledge of the common and scientific names of the major forage crops and their classification are required.  Knowledge of poisonous plants in pasture e.g. *Lantana camara, Crotalaria rotundus*is required.  Knowledge of qualitites of good pasture and forage species e.g. high productivity,  palatability and fast growth is required.  Cultural practices associated with pasture establishment e.g. site selection, land preparation, methods of propagation of pasture, their merits and demerits, i.e. seeding, vegetative means will be assessed.  Understanding of the need to improve natural pastures and the techniques for improving natural pastures will be required.  Skills in managing cultivated pastures e.g. control of fire, proper stocking rate, disease prevention and control will be assessed.  Knowledge of tools/equipment for harvesting forage crops and yield determination will be assessed.  Forage conservation and its importance; the various forms of conserved forage e.g. hay and silage; and differences between hay and silage based on the physical,chemical and nutritive properties will be assessed  The processes and precautions in the preparation of hay and silage e.g. cutting herbage at the right time, proper compacting, use of additives,etc will be assessed.  The different types of crop residue, the merits and demerits of using  residue for feeding ruminants is required.  Knowledge of the common breeds of rabbits and grasscutter will be assessed.  Importance of producing the animals e.g. source of meat, pelt, income, will be assessed.  Production and management practices i.e. housing, feeding, sanitation, breeding, disease and pest control, record keeping will be assessed.  Activities involved in the processing and marketing of rabbits and grascutter will be assessed.  Meaning and importance of snail farming are required.  Knowledge of external features of snails and their functions is required.  Knowledge of types of species used for snail farming is required.  Factors to consider in site selection is required.  Management practices: housing, feeding, sanitation, breeding, pest and disease control, record keeping, processing and marketing is required.  Steps involved in processing snail as well as marketing will be assessed.  (i) Knowledge of animal production  enterprises  (ii) Factors to be considered and  procedures in establishing animal  production enterprise will be  assessed.  Ability to identify common types and breeds of farm animals is required.  Ability to classify farm animals based on the type of digestive system i.e ruminants, non- ruminant (monogastrics) and non-  ruminant herbivores is required.  Ability to describe the orientation of external parts of farm animals and to draw and label animals and their parts will be assessed.  Ability to identify and draw the major anatomical structures in the various body systems; the differences between the structures and their functions will also be assessed.  Ability to identify common feedstuffs and supplements e.g. maize, fish meal, oyster shell; and state the major nutrients they contain is required.  Ability to perform simple food tests for carbohydrates, fats and oils and protein is required.  Ability to formulate feed using the Pearson Square Method, estimate cost of prepared feed and keep feed records will be  assessed.  Ability to identify pests of stored feed and feedstuffs; their effects and control measures will be assessed.  Ability to identify the main pests and parasites of farm animals ( ectoparasites and endoparasites); their effects and control will be assessed.  Ability to draw and label the life cycles of tapeworm and roundworm is required.  Ability to identify the main diseases of farm animals, and causal agents is required.  Simple preventive and control measures such as drenching, dipping, spraying, vaccination; and the various equipment and tools used in their control are also required.  Ability to identify the tools and equipment used in artificial insemination and their uses will be assessed.  Ability to identify and use equipment to determine parameters such as temperature, relative humidity, respiration rate and heart beat; and interpret data will be assessed.  Ability to identify tools and equipment used for management practices such as housing, breeding, brooding, feeding, identification, debeaking, castration,dehorning, and candling; and their maintenance will be assessed.  Ability to identify, and knowledge of the uses of animal products and by-products such as milk, skin, blood meal and feathers will be assessed.  Ability to identify forage crops e.g. *Panicum maximum;* Poisonous plants e.g. *Lantana camara*; and conserved forage e.g.hay and silage is required.  Ability to identify tools and equipment used in the cultivation and managment of pastures and conservation of forage is also required.  Ability to identify suitable material to use in constructing animal houses and structures e.g. cement, bamboo, wire mesh and wood is required.  Ability to identify appropriate structures for various farm animals e.g. hutches for rabbits, open -sided houses for pigs. |