MINISTRY OF EDUCATION

Republic of Ghana

TEACHING SYLLABUS FOR ANIMAL HUSBANDRY (SENIOR HIGH SCHOOL 1 - 3)

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TEACHING SYLLABUS FOR ANIMAL HUSBANDRY

RATIONALE FOR TEACHING ANIMAL HUSBANDRY

Farm animals play a significant role in Ghana's agriculture especially with regards to human welfare, crop production and in the establishment of some agro-based industries. However, the production of poultry and livestock is beset with several problems such as improper resource management, inadequate input supply, theft and negative attitude to animal production as a vocation. There is therefore, an urgent need to take appropriate steps to minimize these production constraints, change attitudes and take appropriate measures to enhance the production of poultry and livestock in Ghana. This will entail ensuring that students acquire the basic competencies - knowledge, skills, attitudes and values – needed to operate as middle level manpower in their education. It will also entail ensuring that students are given the necessary education and training that will equip them with the ability to function completely along the value chain from production through processing, storage, packaging and marketing of animal products. Finally, it will further be necessary to inculcate in students the love for animals and the appreciation of the role of animals as pets for comfort and health enhancement of their owners.

Animal Husbandry at the SHS level is aimed at preparing students adequately to pursue further training in agriculture and animal science at the tertiary level.

GENERAL AIMS

This syllabus is designed to help students to:

1. acquire the necessary knowledge and skills required for profitable animal production practices
2. produce farm animals to cater for the protein needs of the nation
3. apply principles for preventing and controlling pests and diseases of farm animals
4. improve agricultural productivity by managing animal enterprises effectively and efficiently
5. contribute to achieving national self-reliance in animal production
6. develop interest in the field of animal production e.g. snail farming, grasscutter and rabbit rearing, etc.
7. apply environmentally friendly practices to sustain high animal production
8. develop measures for minimizing basic obstacles militating against improved animal production and rural development.
9. use efficient methods in processing, preservation, packaging, storage and marketing of animals and animal products
10. acquire the basic knowledge, skills and attitudes needed for further studies in animal husbandry at higher institutions.

SCOPE OF CONTENT

This course has been designed for students for whom Senior High School education is terminal. The course also provides adequate foundation for students who wish to pursue further education and training in animal science. The coverage of the course is as follows:

- Introduction to Animal Husbandry
- Anatomy and Physiology of Farm Animals
- Animal Nutrition
- Principles of Animal Health
- Genetic Principles and Animal Improvement
- Range and Pasture Management
- Introduction to Environmental Physiology of Farm Animals
- Domestic Pets
- Production, Processing and Marketing of twelve (12) selected Farm Animals.
- Competencies in professional areas of Animal Husbandry
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PROFESSIONAL AREAS OF ANIMAL HUSBANDRY

i. Provide Service on Animal Farms (Farm Hands)
ii. Provide Husbandry Service (Stockmen)
iii. Animal Farm Input Salesperson
iv. Provide Service in Animal Product Processing Industries (Feeds and Meat)
v. Provide Animal Product Storage Service (Feeds and Animal products)
vi. Animal Product Marketing Service (eggs, meat, etc.)
vii. Provide Animal Product Packaging and Transportation Service
viii. Manage Animal Production in small and medium scale enterprises (SMEs)
ix. Manage Live Animal Marketing in SMEs

PRE-REQUISITE SKILLS AND ALLIED SUBJECTS

Students offering Animal Husbandry must have had sound foundation in Integrated Science and Mathematics at the Junior High School level. They should study General Agriculture and two other subjects from the options specified under the SHS Agriculture programme (Chemistry, Physics and Mathematics).

ORGANIZATION OF THE SYLLABUS

The syllabus has been structured to cover three years of the Senior High School programme. Each year's work consists of a number of sections with each section comprising a number of units. The syllabus is presented on the next two pages.

ORGANIZATION AND STRUCTURE OF THE SYLLABUS

YEAR 1	YEAR 2	YEAR 3
SECTION 1: INTRODUCTION TO ANIMAL HUSBANDRY (Pg 1-3) UNIT 1: Meaning, scope and importance of Animal Husbandry UNIT 2: Classification of farm Animals **SECTION 2: ANATOMY & PHYSIOLOGY** (Pg 4-7) UNIT 1: External orientation and parts of Farm Animals UNIT 2: Digestive System UNIT 3: Nervous and Endocrine Systems **SECTION 3: ANIMAL NUTRITION** (Pg 8-9) UNIT 1: Introduction to Animal Nutrition UNIT 2: Feedstuffs and Feed Supplements UNIT 3: Introduction to Range and pastures **SECTION 4: ANIMAL HEALTH** (Pg 12-13) UNIT 1: Concepts of Animal Health	**SECTION 1: ANATOMY AND PHYSIOLOGY OF FARM ANIMALS** (Pg 23-24) UNIT 1: Integumentary, Skeletal and Muscular Systems UNIT 2: Reproductive System **SECTION 2: ANIMAL NUTRITION** (Pg 25-26) UNIT 1: Formulation and Preparation of Animal Feeds UNIT 2: Handling and Storage of Animal Feeds UNIT 3: Pasture Establishment and Management UNIT 4: Forage Conservation and Utilization **SECTION 3: ANIMAL HEALTH** (Pg 27-28) UNIT 1: Ecto- and Endo-parasites of farm animals UNIT 2: Pathogens of Farm Animals UNIT 3: Principles of Prevention and Control of Farm Animal Diseases **SECTION 4: MONOGASTRIC PRODUCTION** (Pg 30-31) UNIT 1: Pig Production: UNIT 2: Poultry Production 1 (Chicken) UNIT 3: Poultry Production 2 (Ducks, Turkeys, Guinea fowls, Ostriches) UNIT 4: Incubation and Hatchery Practice	**SECTION 1: ANATOMY & PHYSIOLOGY OF FARM ANIMALS** (Pg 39-40) UNIT 1: Circulatory System UNIT 2: Respiratory System UNIT 3: Excretory system **SECTION 2: RUMINANT PRODUCTION** (Pg 45-48) UNIT 1: Sheep and Goat Production UNIT 2: Beef cattle Production UNIT 3: Dairy Cattle Production **SECTION 3: NON-TRADITIONAL ANIMAL PRODUCTION** (Pg 49-51) UNIT 1: Rabbit and Grasscutter Production UNIT 2: Snail Farming

YEAR 1	YEAR 2	YEAR 3
SECTION 6: GENETIC PRINCIPLES AND ANIMAL IMPROVEMENT (Pg 14-15) UNIT 1: Heredity and Animal Improvement UNIT 2: Methods of Animal Improvement **SECTION 7: DOMESTIC PETS** (Pg 21-22) UNIT 1: Domestic Pets	**SECTION 5: INTRODUCTION TO ENVIRONMENTAL PHYSIOLOGY OF FARM ANIMALS** (Pg 37-38) UNIT 1: Introduction to Environmental Physiology UNIT 2: Environmental Effects on Production UNIT 3: Environmental Modification and Management	

TIME ALLOCATION

Six periods of teaching and practical work per week are allocated for Animal Husbandry with each period covering 40 minutes. Of the six periods, three should be devoted to practical work and three to theory. The practical aspect of the subject is essential and teachers should give adequate attention to it.

SUGGESTIONS FOR TEACHING THE SYLLABUS

In the Animal Husbandry syllabus, a variety of teaching methods including demonstration, supervised practice, project work, laboratory experiments, Futures Wheel, etc. have been suggested. The rationale for such an approach is to emphasize the need for exposing students to extensive practical work that is necessary for employment and also necessary as a sound foundation for further academic pursuit. It is essential that each school keeps farm animals for students to acquire the required skills and attitudes for successful education and training in animal production.

In spite of available in-school facilities for teaching and learning Animal Husbandry, teachers should arrange to send students on field trips to renowned animal production centres, animal-related research institutes, University farms and animal production and marketing enterprises. Such visits will expose students to a wide range of current research and practical developments in animal production. Where possible, use should be made of resource persons from Ministry of Food and Agriculture, Research Institutions, Marketing Associations, Environmental Protection Agencies, etc. Teacher should ensure that students keep proper records of all practical activities in their field notebooks/farm diaries, record books, etc.

The teacher's attention is further drawn to some new concepts that have been introduced in this syllabus to help improve instructional delivery and learning. Read this section very carefully and relate the information to your repertoire of teaching methods and skills.

General Objectives

General Objectives have been listed at the beginning of each Section of the syllabus. The general objectives specify the skills and behaviours the student should acquire after learning the units of a section. Read the general objectives very carefully before you start teaching the section. After teaching all the units of the section, go back and read the general objectives again to be sure you have covered the objectives adequately in the course of your teaching.

Lastly, bear in mind that the syllabus cannot be taken as a substitute for lesson plans. It is therefore, necessary that you develop a scheme of work and lesson plans for teaching the units of this syllabus.

Sections and Units: The syllabus has been planned on the basis of Sections and Units. Each year's work is divided into sections. A section consists of a fairly homogeneous body of knowledge within the subject. Within each section are units. A unit consists of a more related and homogeneous body of knowledge and skills.

The syllabus is structured in five columns: Units, Specific Objectives, Content, Teaching and Learning Activities and Evaluation. A description of the contents of each column is as follows:

Column 1 - Units: The units in Column 1 are divisions of the major topics of the section. You are expected to follow the unit topics according to the linear order in which they have been presented. However, if you find at some point that teaching and learning in your class will be more effective if you skipped to another unit before coming back to the unit in the sequence, you are encouraged to do so.

Column 2 - Specific Objectives: Column 2 shows the Specific Objectives for each unit. The specific objectives begin with numbers such as 1.3.5 or 2.2.1. These numbers are referred to as "Syllabus Reference Numbers". The first digit in the syllabus reference number refers to the section; the second digit refers to the unit, while the third digit refers to the rank order of the specific objective. For instance, 1.3.5 means: Section 1, Unit 3 (of Section 1) and Specific Objective 5. In other words, 1.3.5 refers to Specific Objective 5 of Unit 3 of Section 1. Similarly, the syllabus reference number 2.2.1 simply means Specific Objective number 1 of Unit 2 of Section 2. Using syllabus reference numbers provides an easy way for communication among teachers and other educators. It further provides an easy way for selecting objectives for test construction. Let's say for instance, that Unit 2 of Section 2 has five specific objectives: 2.2.1 - 2.2.5. A teacher may want to base his/her test items/questions on objectives 2.2.3 and 2.2.4 and not use the other three objectives. In this way, a teacher would sample the objectives within units and within sections to be able to develop a test that accurately reflects the importance of the various skills taught in class.

You will note also that specific objectives have been stated in terms of the student i.e., *what the student will be able to do after instruction and learning in the unit*. Each specific objective hence starts with the following, "The student will be able to." This in effect, means that you have to address the learning problems of each individual student. It means individualizing your instruction as much as possible such that the majority of students will be able to master the objectives of each unit of the syllabus.

Column 3 - Content: The "content" in the third column of the syllabus presents a selected body of information that you will need to use in teaching the particular unit. In some cases, the content presented is quite exhaustive. In some other cases, you could add more information to the content presented. In a few cases the content space has been left blank for you to supply the necessary content. You should, as much as possible, provide more information by reading from books and other sources.

Column 4 -Teaching and Learning Activities (T/L): T/L activities that will ensure maximum student participation in the lessons are presented in Column 4. Avoid rote learning and drill-oriented methods and rather emphasize participatory teaching and learning, and also emphasize the cognitive, affective and psychomotor domains of knowledge in your instructional system wherever appropriate. You are encouraged to re-order the suggested teaching and learning activities and also add to them where necessary in order to achieve optimum student learning.

The major purpose of teaching and learning is to help students to be able to apply their knowledge in dealing with issues both in and out of school. A suggestion that will help your students acquire the habit of analytical thinking and the capacity for applying their knowledge to problems is to begin each lesson with a practical problem. Select a practical problem for each lesson. The selection must be made such that students can use knowledge gained in the previous lesson and other types of information not specifically taught in class. At the beginning of a lesson, state the problem, or write the problem on the board. Let students analyse the problem, suggest solutions etc., criticize solutions offered, justify solutions and evaluate the worth of possible solutions. There may be a number of units where you need to re-order specific objectives to achieve such required effects. The emphasis is to assist your students to develop analytical thinking and practical problem solving techniques. You are encouraged to use teaching aids, visits and resource persons for effective delivery of lessons.

Column 5 - Evaluation: Suggestions and exercises for evaluating the lessons of each unit are indicated in Column 5. Evaluation exercises can be in the form of oral questions, quizzes, class assignments, essays, structured questions, project work etc. Ask questions and set tasks and assignments that will challenge your students to apply their knowledge to issues and problems in animal husbandry and that will engage them in developing solutions, and developing positive attitudes as a result of having undergone instruction in this subject. The suggested evaluation tasks are not exhaustive. You are encouraged to develop other creative evaluation tasks to ensure that students have mastered the instruction and behaviours implied in the specific objectives of each unit. For evaluation during class lessons, determine the mastery level you want students to achieve in their answers and responses. If for instance, you take 80% as the mastery level, ensure that each student's answer to questions asked in class achieves this level of mastery.

PROFILE DIMENSIONS

Profile dimensions are derived from the cognitive, affective and psychomotor domains of educational objectives. From the cognitive domain, two profile dimensions are developed; namely Knowledge and Understanding (KU) and Application of Knowledge (AK). The affective domain covers beliefs, attitudes and values. The psychomotor domain covers physical and combined skills normally referred to as process skills or practical skills. Specific objectives used in developing syllabuses or training programmes describe behaviours to be exhibited by learners after going through a learning process. A specific objective represents attributes of learning from one or more of the domains of educational objectives.

Each of the specific objectives in this syllabus contains an action verb that specifies the type of learning or skill that the student should acquire by the end of the instructional period. A specific objective as follows: The student will be able to describe …etc. contains an action verb "describe" that indicates what the student will be able to do after teaching and learning have taken place. Being able to "describe" something after the instruction has been completed means that the student has acquired "knowledge". Being able to explain, summarize, give examples, etc. means that the student has understood the lesson taught. Similarly, being able to develop, plan, construct etc, means that the student has learnt to create, innovate or synthesize knowledge. Each of the action verbs in the specific objectives of the syllabus describes the behaviour the student will be able to demonstrate after the instruction. "Knowledge", "Application", etc. are dimensions that should be the prime focus of teaching, learning and assessment in schools. Profile dimensions describe the underlying behaviours for teaching, learning and assessment. Animal Husbandry is a practical subject and the learning required is best achieved by practical application of skills learnt. The profile dimensions required in this subject and their respective weights are as follows:

Knowledge and Understanding	20**%**
Application of Knowledge	30**%**
Attitudes and Practical Skills	50**%**

Each of the dimensions has been given a percentage weight that should be reflected in teaching, learning and testing. The weights indicate the relative emphasis that the teacher should give in the teaching, learning and testing processes. The percentages indicate 50:50 proportional weighting for theory and practice. Combining the three dimensions in the teaching and learning process will ensure that animal husbandry is taught and studied not only at the cognitive level, but will also lead to the acquisition of practical skills in the subject. Note that "application of knowledge" above includes analytical ability and creative ability. The explanation of the key words involved in each of the profile dimensions is as follows:

Knowledge and Understanding (KU)

Knowledge	The ability to: remember, recall, identify, define, describe, list, name, match, state principles, facts and concepts. Knowledge is simply the ability to remember or recall material already learned and constitutes the lowest level of learning.
Understanding	The ability to: explain, summarize, translate, rewrite, paraphrase, give examples, generalize, estimate or predict consequences based upon a trend. Understanding is generally the ability to grasp the meaning of some material that may be verbal, pictorial, or symbolic.

Application of Knowledge (AK)

Ability to use knowledge or apply knowledge, as implied in this syllabus, has a number of learning/behaviour levels as already indicated above. These levels include application, analysis, innovation or creativity, and evaluation. These may be considered and taught separately, paying attention to reflect each of them equally in your teaching. The dimension "Use of Knowledge" or “application of knowledge” is a summary dimension of all four learning levels. Details of each of the four sub-levels of the dimension are as follows:

Application — The ability to:
apply rules, methods, principles, theories, etc. to concrete situations that are new and unfamiliar. It also involves the ability to produce, solve, operate, demonstrate, discover etc.

Analysis — The ability to:
break down materials into its component parts; to differentiate, compare, distinguish, outline, separate, identify significant points etc, recognize unstated assumptions and logical facilities, recognize inferences from facts etc.

Innovation/
Creativity - The ability:
synthesize or put different parts together to form a new whole. It involves the ability to combine, compile, compose, devise, suggest a new idea or possible ways, plan, revise, design, organize, create, and generate new solutions. The ability to create or innovate is the highest form of learning. The world becomes more comfortable because some people, based on their learning, bring new ideas, design and create new things.

Evaluation — The ability to:
appraise, compare features of different things and make comments or judgments, contrast, criticize, justify, support, discuss, conclude, make recommendations etc. Evaluation refers to the ability to judge the worth or value of some materials, ideas etc., based on some criteria. Evaluation is a constant decision making activity. We generally compare, appraise and select throughout the day. Every decision we make involves evaluation. Evaluation is a high level ability just as application, analysis and innovation or creativity since it goes beyond simple knowledge acquisition and understanding.

Competency Based Learning

Competency learning is a combination of knowledge, skills involving the ability to use tools and equipment for accomplishing work to acceptable standards in the industry. Competency includes cognitive and practical skills as well as attitudinal and other personality characteristics. These characteristics include principles of social orientation that is, the core values of honesty, fairness, reliability, trustworthiness, cooperation and support as well as the ability to relate well with people. Competency Based Learning has been adopted for teaching and learning practical subjects.

Competency Based Learning requires students to perform tasks by using relevant knowledge, skills, and tools to achieve specified targets within specified times. Competence involves *application of knowledge* in a significant range of work activities, performed in a variety of contexts/activities which may be complex and non-routine and where some individual responsibility or autonomy is needed. Collaboration with others perhaps through membership of a work group or team may often be a requirement. Personal accountability for analysis, diagnosis, design, planning, execution and evaluation of task may also be required. The case study approach in teaching and learning is particularly suitable in providing students with situations which they could emulate to reach high levels of professional practice.

Attitudes and Practical Skills (APS)

Attitudes and Practical skills form the third profile dimension in practical or vocational subjects. They are competencies or abilities required for performing satisfactorily in a job. Performance is a reflection of skills. Four types of skills are identified in job performance:

1. Intellectual skills
2. Psychomotor skills
3. Social skills
4. Attitudes

Intellectual skills

Intellectual skills in job performance are also referred to as perceptual skills. They enable a person to conceptualise performance. Conceptualisation is a mental skill which depends largely on one's cognitive abilities. One needs to conceptualise and visualise an action before it is performed. For example, one needs to know the names of all goat breeds in a given country, describe the characteristics of the goat breeds before being able to identify an abnormality in a particular goat.

Psychomotor skills

Psychomotor skills refer to motor activities which are performed with an intention. It needs coordinated movement of hand, body and muscles, and mental abilities to guide movement. They involve demonstration of manipulative skills in using tools, machines and equipment to carry out practical operations and to solve practical problems. The element of thinking is much needed in movement in order to perform a given task.

Examples of activities involving psychomotor skills include:
1. Equipment Handling
2. Observation
3. Manipulation
4. Measuring
5. Recording
6. Reporting
7. Creativity/innovation
8. Communication

Equipment Handling: Students should be able to handle and use equipment properly for practical work in Animal Husbandry. The teacher should ensure that students acquire a high level of proficiency in the use of tools and equipment relevant to the field of Animal Husbandry.

Observation: The student should be able to use his/her senses to make accurate observations. He/she should, for instance, be able to tell the colour, form, texture and the structure of specimens provided and be able to classify them.

Manipulation: Manipulation involves the skilful handling of scientific objects and tools for accomplishing specific tasks.

Measuring: Refers to the accurate use of measuring instruments and equipment. The teacher should guide students to make accurate measurements of specimens, chemicals etc.

Recording: Recordings must aim at a high degree of accuracy.

Reporting: Students should be able to present pertinent and precise reports on projects they undertake. Reports, oral or written, should be concise, clear and accurate.

Creativity/innovation: Students should be encouraged to be creative and be able to use new methods in carrying out projects. You can help your students to be creative by encouraging any little creative and innovative efforts, techniques and products they may develop.

Communication: Students should be guided to develop effective oral and written communication skills necessary for group work, reports etc.

The teaching and assessment of psychomotor skills should involve practical experiences in work sites, field work, experiments, projects, case studies and field studies.

Social skills

Social skills refer to activities which are performed in a given social context. For example, interviewing people for information involve social skills. The effectiveness of interviewing people for information does not only depend on the verbal fluency of an interviewer, but largely on how well the interviewer approaches the interviewee, how accurate the interviewer was in selecting an interviewee. Both the content of the interview and how one conducts the interview are important. Examples of social skills include effective communication with farmers, good relation to the farmer when conducting an interview, understanding farmers indirect expressions, etc.

Attitudes

Attitudes are feelings one develops towards something. The feelings can be positive or negative. An individual who has positive attitude to work can derive happiness from his or her work, enjoys the job and is willing to do more, makes clients feel more attached, values the individual and appreciates services received from farmers and suppliers as well as services the individual renders.

A person with negative attitudes to work does a job only as a means of livelihood, achieves no job satisfaction, has poor results and has clients who are unhappy with him or her. Attitudes influence job performance. Education and training in agriculture should therefore be aimed at cultivating positive attitudes to agricultural work.

Assessment of Attitudes and Practical Skills

Process Assessment: The processes or steps (sub-skills) involved in performing a task are observed and rated with marks or letter grades. In awarding marks or grading, the performance of the learner is judged by comparing the performance to the indicator of acceptable practical work performance. In judging, depending on the type of sub-skill, a learner is awarded grade A if the performance matches the indicator of acceptable performance. The learner is given grade B is awarded if performance is acceptable but below the indicator standard. Grade C is awarded if achieved performance is below the indicator and is unacceptable. The three level grading system is adopted if the sub-skills are not crucial for successful performance of the whole task. If the sub-skills are crucial for achieving successful task performance, then a two level grading type is used. In such cases, an A is awarded for successful performance and a B is given for unsuccessful performance

Product Assessment: The quality of a finished product is assessed using the criteria describing the quality standards of the product. Marks are awarded depending on the level of match between the criteria for assessment and the product.

Competency Assessment (Proficiency assessment): In competency assessment, the quality of a product or task and the speed used in performing the task are crucial. The two level grading system is normally used. For example, after students have learned and acquired the skills in castrating pigs, a number of piglets are given them to castrate within a specified time frame. Students who complete the assignment successfully within the time period using the skills required obtain grade A, while those who fail to castrate the animals successfully or did not meet the time limits get grade B. In other words, students who obtain grade B are not competent or proficient in performing the task.

The action verbs provided under the profile dimensions should help you to structure your teaching such as to achieve the effects needed. Select from the action verbs provided for your teaching, in evaluating learning before, during and after the instruction. Use the action verbs also in writing your test questions. This will ensure that you give your students the chance to develop good thinking skills, and the capacity for excellent performance in examinations and in practical life situations. Check the weights of the profile dimensions to ensure that you have given the required emphasis to each of the dimensions in your teaching and assessment.

FORM OF ASSESSMENT

It must be emphasized again that it is important that both instruction and assessment be based on the profile dimensions of the subject. In developing assessment procedures, select specific objectives in such a way that you will be able to assess a representative sample of the syllabus objectives. Each specific objective in the syllabus is considered a criterion to be achieved by the student. When you develop a test that consists of items or questions that are based on a representative sample of the specific objectives taught, the test is referred to as a "Criterion-Referenced Test". In many cases, a teacher cannot test all the objectives taught in a term, in a year etc. The assessment procedure you use i.e. class tests, home work, projects etc. must be developed in such a way that it will consist of a sample of the important objectives taught over a period.

The example on the next page shows an examination consisting of three papers, Paper 1, Paper 2, Paper 3 and School Based Assessment (SBA). Paper 1 will usually be an objective-type paper; Paper 2 will consist of structured questions or essay questions, essentially testing "Application of Knowledge", but also consisting of some questions on "Knowledge and Understanding". Paper 3 will be the practical test paper, while the SBA will be based on all three dimensions as indicated. The distribution of marks for the objective test items, essay type questions and the practical questions in the three papers and in the SBA should be in line with the weights of the profile dimensions already indicated and as shown in the last column of the table below.

The West African Examinations Council (WAEC) generally sets about 60 objective test items at the WASSCE. Emulate this by developing an objective test paper (Paper 1) that consists of 60 items. Paper 2 could consist of some structured questions and essay questions. In general, let students answer five essay questions from a list of 7-10 questions. Paper 3 will consist of 5-7 practical questions.

In the examination structure presented below, Paper 1 is marked out of 60; Paper 2 is marked out of 90, Paper 3 marked out of 150, and the SBA is marked out of 100, giving a total of 400 marks. The last row shows the weight of the marks allocated to each of the four test components. The three papers are weighted differently. Paper 2 is a more intellectually demanding paper and is therefore weighted more than Papers 1 and 3.

Distribution of Examination Paper Weights And Marks

Dimensions	Paper 1	Paper 2	Paper 3	SBA	Total Marks	% Weight of Dimension
Knowledge and Understanding	40	20	-	20	80	20
Application of Knowledge	20	70	-	30	120	30
Attitudes & Practical Skills	-	-	150	50	200	50
Total Marks	60	90	150	100	**400**	
% Contribution of Papers	15	35	20	30		**100**

You will note that Paper 1 has a contribution of 15% to the total marks; Paper 2 has a contribution of 35% to the total marks; Paper 3 has a contribution of 20%, and School-Based Assessment (SBA) has a contribution of 30% to the total marks. The numbers in the cells indicate the marks to be allocated to the items/questions that test each of the dimensions within the respective test papers.

The last but one column shows the total marks allocated to each of the dimensions. Note that the numbers in this column are additions of the numbers in the cells and they agree with the profile dimension weights indicated in the last column. Of the total marks of 400, 80 marks, equivalent to 20% of the total marks, are allocated to Knowledge and Understanding. 120 marks, equivalent to 30% of the total marks are allocated to Application of Knowledge and 200 marks, equivalent to 50% are allocated to Attitudes and Practical Skills. The weights of each of the three dimensions are indicated in the last column. The ratio of theory to practice in the *Animal Husbandry* is 50:50.

GUIDELINES FOR SCHOOL-BASED ASSESSMENT (SBA)

A new School Based Assessment system (SBA) will be introduced into the school system in 2011. The new SBA system is designed to provide schools with an internal assessment system that will help schools to achieve the following purposes:

- Standardize the practice of internal school-based assessment in all Senior High Schools in the country
- Provide reduced assessment tasks for subjects studied at SHS
- Provide teachers with guidelines for constructing assessment items/questions and other assessment tasks
- Introduce standards of achievement in each subject and in each SHS class
- Provide guidance in marking and grading of test items/questions and other assessment tasks
- Introduce a system of moderation that will ensure accuracy and reliability of teachers' marks
- Provide teachers with advice on how to conduct remedial instruction on difficult areas of the syllabus to improve class performance.

SBA may be conducted in schools using the following: Mid-term test, Group Exercise, End-of-Term Test and Project

1. Project: This will consist of a selected topic to be carried out by groups of students for a year. Segments of the project will be carried out each term toward the final project completion at the end of the year,

   The projects may include the following:
   i) farm work
   ii) experiment
   iii) investigative study (including case study)

   A report must be written for each project undertaken.

2. Mid-Term Test: The mid-term test following a prescribed format will form part of the SBA

3. Group Exercise: This will consist of written assignments or practical work on a topic(s) considered important or complicated in the term's syllabus

4. End-of-Tem Test: The end –of-term test is a summative assessment system and should consist of the knowledge and skills students have acquired in the term. The end-of-term test for Term 3 for example, should be composed of items/questions based on the specific objectives studied over the three terms, using a different weighting system such as to reflect the importance of the work done in each term in appropriate proportions. For example, a teacher may build an End-of-Term 3 test in such a way that it would consist of the 20% of the objectives studied in Term 1, 20% of objectives studied in Term 2 and 60% of the objectives studied in Term 3.

GRADING PROCEDURE

To improve assessment and grading and also introduce uniformity in schools, it is recommended that schools adopt the following WASSCE grade structure for assigning grades on students' test results. The WASSCE structure is as follows:

Grade A1:	80 - 100%	-	Excellent
Grade B2:	70 - 79%	-	Very Good
Grade B3:	60 - 69%	-	Good
Grade C4:	55 - 59%	-	Credit
Grade C5:	50 - 54%	-	Credit
Grade C6:	45 - 49%	-	Credit
Grade D7:	40 - 44%	-	Pass
Grade D8:	35 - 39%	-	Pass
Grade F9:	34% and below	-	Fail

In assigning grades to students' test results, you are encouraged to apply the above grade boundaries and the descriptors which indicate the meaning of each grade. The grade boundaries i.e., 60-69%, 50-54% etc., are the grade cut-off scores. For instance, the grade cut-off score for B2 grade is 70-79% in the example. When you adopt a fixed cut-off score grading system as in this example, you are using the criterion-referenced grading system. By this system a student must make a specified score to be awarded the requisite grade. This system of grading challenges students to study harder to earn better grades. It is hence a very useful system for grading achievement tests.

Always remember to develop and use a marking scheme for marking your class examination scripts. A marking scheme consists of the points for the best answer you expect for each question, and the marks allocated for each point raised by the student as well as the total marks for the question. For instance, if a question carries 20 marks and you expect 6 points in the best answer, you could allocate 3 marks or part of it (depending upon the quality of the points raised by the student) to each point , hence totalling 18 marks, and then give the remaining 2 marks or part of it for organisation of answer. For objective test papers you may develop an answer key to speed up the marking.

SENIOR HIGH SCHOOL - YEAR 1

SECTION 1

INTRODUCTION TO ANIMAL HUSBANDRY

General Objectives: The student will:

1. be aware of the meaning and scope of Animal Husbandry
2. recognize the socio-economic importance of farm animals
3. recognise the importance of food quality and safety standards in animal husbandry
4. appreciate the vocations in Animal Husbandry

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Students to:	
MEANING, SCOPE AND IMPORTANCE OF ANIMAL HUSBANDRY	1.1.1 give the meaning, scope and importance of animal husbandry.	Meaning, scope and importance of animal husbandry. Meaning; -Raising of farm animals Scope; -Nutrition, Health, etc.	brainstorm to bring out the meaning of animal husbandry. -discuss the scope of animal husbandry.	Mention six specialized branches of scientific knowledge that support animal production and marketing.
		Importance of farm animals -Source of food, employment, income, security, etc.	discuss the importance of farm animals e.g. economic, social, environmental.	Discuss the contributions of farm animals to the national economy.
	1.1.2 describe the quality and safety standards of food obtained from farm animals	Quality and safety standards of animal food products - Fresh /Frozen Meat: Appearance, odour/colour, absence of chemical contaminants - Egg: External Qualities (Cleanness, no cracks on shell, shell colour, size of egg) Internal Qualities (absence of microbial contaminants such as Salmonella, yolk colour, firmness of egg white (albumen)	- brainstorm to explain the concept of animal food quality and safety standards. - contact Standards Board/Food and Drugs Board / Veterinary Officer to find out quality and safety standards of various animal food products as listed in content: - discuss the quality standards listed in content	List four quality and safety standards of animal food products State and explain three external and internal qualities of egg.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 (CONT'D) **MEANING, SCOPE AND IMPORTANCE OF ANIMAL HUSBANDRY**	The student will be able to:	- Milk: Absence of micro-organisms, taste (not sour), colour (should not be yellowish) - Dried/Smoked Meat: Absence of living or dead organisms, absence of foreign matter, absence of bad odour and flavour, absence of moulds, colour (absence of charring), absence of liquid exudate - Canned Meat: Non-Rusted can, expiry date	Students to: - brainstorm to list and describe practices in maintaining quality and safety standards in the production of animal food products Teacher to organise a field trip to an abattoir for students to observe the practices for ensuring high quality animal products	State and explain the importance of three qualities of milk. State and explain the importance of four qualities of smoked meat.
	1.1.3 Outline the practices for maintaining quality and safety standards in animal food products	Practices for maintaining quality and safety standards in animal food products - Ante-mortem examination - Post-mortem examination - Handling of animal before slaughter - Proper draining of blood - Cleanness in abattoir - Burning of fur/Skinning		

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING OBJECTIVES	EVALUATION
UNIT 2 (CON'D) **MEANING SCOPE AND IMPORTANCE OF ANIMAL HUSBANDRY**	The student will be able to: 1.1.4 analyse the effects of consuming poor quality animal food products 1.1.5 identify different vocations in animal husbandry and related enterprises 1.1.6 outline problems of animal husbandry in West Africa.	Effects of consuming poor quality animal food products on human health Jobs in animal husbandry and related enterprises. E.g.: Breeders, Nutritionists, Hatchery Operators, etc. Problems of the animal husbandry in West Africa.	Students to: use the Futures Wheel to trace the effects of consuming poor quality animal food products on human health discuss vocations/job opportunities in the animal production industry, e.g.: Breeders, Nutritionists, Hatchery Operators, etc. visit Animal Husbandry establishments and related enterprises and discuss the prospects in the occupations Interview farmers and service providers on problems they encounter in the production and service provision in the industry. They should also find out the possible solutions. Student to write and present reports for class discussion.	Project: Students to conduct a survey of animal food products in the locality by visiting animal processing sites to interview and observe activities. They should compare the observed activities to the animal food quality standards. Students to design a programme to ensure maintenance of animal food quality standards in the community. List five vocations each in the following livestock enterprises i. Animal health ii. Feed milling iii. Meat processing and marketing Outline three problems associated with animal production in your country and suggest solutions to each of them.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING OBJECTIVES	EVALUATION
UNIT 2 **CLASSIFICATION OF FARM ANIMALS**	The student will be able to: 1.2.1 classify farm animals	Classification of farm animals 1. Traditional and non-traditional farm animals. E.g. of traditional farm animals Cattle, Sheep, Goat, Poultry, etc E.g. of non-traditional farm animals Snail, Grasscutters, etc. 2. Monogastric, Non-ruminant herbivore and Ruminant herbivore	Students to: give examples of traditional and non-traditional farm animals. state the reasons for grouping the animals as traditional or non-traditional. examine the digestive systems of a monogastric animal (e.g. chicken, pig), a non-ruminant herbivore (e.g. rabbit, grasscutter) and a ruminant herbivore (e.g. sheep, goat)	Discuss the contribution of a named non-traditional farm animal to the nutrition of the household. Give the differences between ruminants and non-ruminants.

SECTION 2

ANATOMY AND PHYSIOLOGY OF FARM ANIMALS

General Objectives: The student will:

1. recognize the external and internal features of farm animals
2. be aware of the digestive system and the processes of digestion in farm animals
3. appreciate the functions of the nervous and endocrine systems of farm animals

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Students to:	
EXTERNAL ORIENTATION AND PARTS OF FARM ANIMALS	2.1.1 distinguish between "Anatomy" and "Physiology".	Definition of anatomy and physiology Anatomy - the scientific study of the body and how its parts are arranged. Physiology - the scientific study of the way in which the bodies of animals work	observe live animals and/or charts/pictures of different classes of farm animals to explain the terms '*anatomy* and *physiology*'. explain the significance of the various orientations in farm animals.	Use search engines to find differences between farm animals and birds
	2.1.2 identify the posterior, ventral, lateral and dorsal positions of farm animals.	External orientation of farm animals.	use models/charts/live animals to guide students to locate the posterior, ventral etc. positions of farm animals.	

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D)	The student will be able to:		Students to:	
EXTERNAL ORIENTATION AND PARTS OF FARM ANIMALS	2.1.3 identify the external parts of farm animals.	External parts - hind limbs, forelimbs, ear, head, etc. in different farm animals.	draw a named farm animal and indicate the external parts. brainstorm on differences between external parts of different animals. **NOTE**: Teacher may use live animal or model for demonstration.	Describe the location of parts of the animal (e.g. ears, neck, etc) with respect to other parts (e.g. hind limb, muzzle, etc)
UNIT 2				
DIGESTIVE SYSTEM	2.2.1 distinguish between the digestive systems of ruminants and non-ruminants.	Comparative Anatomy of the digestive systems of ruminants, non-ruminant herbivores and monogastrics.	use charts/live specimens, etc. to discuss the main features of the digestive systems of ruminants, non-ruminants and monogastrics, highlighting the differences in structure and function. empty the gut/intestinal tract of faeces, clean and observe the cut sections of the stomach. classify the animals based on the observations. **NOTE:** Dissect the animals.	Draw and label the digestive system of a named farm animal. Describe the inner lining of the small intestines, reticulum, rumen, omasum and gizzard
	2.2.2 describe the digestion processes in monogastrics, ruminants and non-ruminant herbivores.	Digestion in: - monogastrics - ruminants - non-ruminant herbivores	discuss the digestion processes in monogastrics, ruminants and non-ruminant herbivores.	
	2.2.3 explain the role of specific enzymes in the digestion process.	Role of enzymes in the digestion of carbohydrates, cellulose, proteins, fats and oils in farm animals.	discuss the role of specific enzymes in the digestion process	Explain how a deficiency of each of the following enzymes affects digestion of food: (i) pepsin (ii) amylase (iii) lipase

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 (CONT'D)	The student will be able to:		Students to:	
DIGESTIVE SYSTEM	2.2.4 describe the absorption of nutrients in monogastrics, ruminants, and non-ruminant herbivores.	Absorption of nutrients: -Structures and processes involved.	use model/chart to describe and explain the absorption of nutrients.	Draw and label a villus. Explain how destruction of the villi reduces absorption of nutrients.
UNIT 3				
NERVOUS AND ENDOCRINE SYSTEMS	2.3.1 describe the actions of the Central Nervous System and the Autonomic Nervous System.	The Central Nervous System (CNS). - Brain and Spinal Cord. Autonomic Nervous System: (ANS): - Sympathetic Nervous System - Parasympathetic nervous System	identify the parts of the CNS and ANS. describe the different modes of action of the CNS and ANS. give examples of the controlling and co-ordinating role of the nervous system.	When a hot object was placed on a cow, it jumped quickly and vigorously. Explain the role of the nervous system in this reaction
	2.3.2 describe how the autonomic nervous system (ANS) maintains internal stability of the animal.	Function of the Autonomic Nervous System.	explain how sensations are mediated through nerve fibres. identify the role of efferent and afferent nerves in the transmission of messages. describe the processes the ANS employs to ensure homeostasis by the use of charts/models/audio-visuals .	

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 (CONT'D) **NERVOUS AND ENDOCRINE SYSTEMS**	The student will be able to: 2.3.3 explain the functions of endocrine glands.	Endocrine glands and their functions.	Students to: define endocrine glands and state their functions mention the part of the body where each of the endocrine glands is found.	
	2.3.4 define the term "hormone" and explain how it functions.	Definition and function of a hormone: A chemical messenger secreted into the blood by endocrine gland to effect changes in function of the specific tissue.	describe the mode of action of hormones. give examples of hormones and their specific actions in animals. explain the need to administer synthetic hormones to farm animals.	What are hormones? State the functions of each of the following hormones in farm animals. (a) Adrenaline (b) Thyroxin (c) Insulin
	2.3.5 explain how hormones help to maintain a constant internal environment.	Role of hormones in the maintenance of normal body functions.	discuss how specific hormones act to maintain body functions at normal levels.	Give the differences between the nervous system and endocrine system in terms of structure and function.

SENIOR HIGH SCHOOL - YEAR 1

SECTION 3

ANIMAL NUTRITION

General Objectives: The student will:

1. identify the differences in the various modes of Nutrition in Farm animals
2. be aware of the role of carbohydrates, proteins and other nutrients in Animal Metabolism
3. recognize the importance of pastures and forage crops in animal production

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Students to:	
INTRODUCTION TO ANIMAL NUTRITION	3.1.1 define nutrition	Definition of nutrition	brainstorm to define "nutrition".	What is nutrition?
	3.1.2 explain the role of nutrition in the production of farm animals.	Importance of nutrition in animal production eg. improves body resistance to disease, production level, etc.	discuss the role of nutrition in the production of farm animals.	Outline the role of nutrition in the production of farm animals.
	3.1.3 apply terms used in animal nutrition correctly.	Basic terms: - feedstuff/ingredient - nutrients - diet - malnutrition - ration - grazing - browsing - roughage - concentrate etc.	explain the differences between roughages, and concentrates, and apply them correctly in animal nutrition.	Explain each of the following terms: - feedstuff, nutrients, diet, malnutrition and ration Distinguish between roughage and concentrate.
	3.1.4 outline modes of feeding in different farm animals.	Modes of feeding in:- - herbivores - carnivores - omnivores	outline differences in the various modes of feeding in farm animals: - non-ruminant herbivore , e.g. rabbit - ruminant herbivore . e.g. goat - carnivore, e.g. cat - omnivore, e.g. pig	Compare the modes of feeding in rabbits and goats. How does the type of dentition affect feeding in farm animals

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 **FEEDSTUFFS AND FEED SUPPLEMENT**	3.2.1 list common feedstuffs and supplements.	Feedstuffs and supplements.	discuss the various feedstuffs and feed supplements	Mention five (5) feed ingredients and state the major nutrients they provide.
	3.2.2 state major nutrients in feedstuffs.	Major nutrients in feedstuffs. (Carbohydrates, Proteins, Vitamins, Minerals, Fats and Water)	collect samples of feedstuffs and group them according to the nutrients they supply. e.g, maize- carbohydrates, fish- proteins, etc. discuss the role/function of major nutrients supplied	
	3.2.3 use food tests to identify carbohydrates, fats and proteins.	Food tests	perform simple food tests for carbohydrates, fats and protein	Test for carbohydrates, fats and protein in maize meal and fresh groundnuts. Write a report on your method, observations and conclusions.
	3.2.4 mention some producers and suppliers of feedstuffs and supplements.	Producers and suppliers of feedstuffs and supplements	prepare a list of major producers and suppliers of feedstuffs and supplements in the country	

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 **INTRODUCTION TO RANGE AND PASTURES**	The student will be able to: 3.3.1 explain some terms in pasture and range management.	Basic terminologies in pasture and range management eg. pasture, pasture rotation, stocking rate, etc.	Students to: explain the terms Range, Pasture and Forage Crops. discuss the importance of pastures and forage crops in animal production.	Explain the following terms: Range, Pasture and Forage Crops Discuss the importance of pasture in animal production.
	3.3.2 mention the various types of pastures and their features.	Types of pastures and their Features -Natural pasture/range -Artificial pasture/Cultivated forage	discuss types of pastures and their features. mention factors that influence the productivity of the different pasture types	Compare and contrast natural and artificial pastures
	3.3.3 outline the roles of pastures and forage crops in ruminant production.	Role of pastures in ruminant production	discuss the roles of pastures and forage crops in ruminant production.	
	3.3.4 identify major forage crops and poisonous plants in pastures.	Major forage crops and poisonous plants Types of forage crops, - Grasses - Legumes Examples of poisonous plants - *Lantana camara* - *Crotalaria rotundus*	collect and identify forage and pasture plants e.g. *Panicum maximum* - *Pennisetum purpureum* - *Mellinis minutiflora* - *Centrosema pubescens* prepare forage albums. identify poisonous plants undertake field trips to a farm with established pasture to study pasture management practices	State five (5) examples each of grasses and leguminous crops/ plants used as forage plants. Write a report on the field trip to an established pasture
	3.3.5 establish and maintain a pasture.	Establishment and maintenance of pasture	establish four 10 m^2 plots with different pasture species in the school and manage pasture plots harvest forage with the appropriate tools/equipment and determine yield	

SENIOR HIGH SCHOOL - YEAR 1

SECTION 4

ANIMAL HEALTH

General Objectives: The student will:

1. recognise basic concepts of health in animal production
2. be aware of the characteristics of healthy and sick animals
3. appreciate the importance of zoonotic diseases.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Students to:	
CONCEPTS OF ANIMAL HEALTH	4.1.1 define the terms disease, pests and parasite.	Diseases, pests and parasites	brainstorm to bring out the meaning of the terms disease, pests and parasites. identify healthy and sick animals. describe the signs associated with healthy and sick animals	Explain the following terms : i. disease ii. pest iii. parasite Outline five (5) signs each of good health and ill-health in farm animals.
	4.1.2 state factors that pre-dispose animals to diseases.	Pre-disposing factors to diseases. (eg. Stress, overcrowding, poor housing/sanitation, etc.)	form groups to discuss factors pre-disposing animals to diseases.	List five (5) factors that pre-dispose animals to diseases.
	4.1.3 outline the economic effects of diseases, pests and parasites on animal production.	Effects of diseases, pests and parasites on the economic value of animals/animal products - Reduced value/output - Loss of income - Reduced quality of product.	discuss the effects of diseases, pests and parasite on the economic value of animal and income. interview farmers to determine cost of disease and pest control, value of lost income due to death of animals, etc	Investigate the effects of diseases, pests and parasites on farm animals. Presentation should include; -Causes of stress -How stress predisposes animals to disease -Measures to reduce stress in farm animals

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D) **CONCEPTS OF ANIMAL HEALTH**	The student will be able to:		Students to:	
	4.1.4 define zoonotic diseases and state their importance.	Zoonotic diseases:- - Definition: Diseases of animals that also affect humans	discuss diseases that attack animals and human beings. brainstorm to bring out the importance of zoonotic diseases.	What is a zoonotic disease? Give one example and discuss ways of preventing it.
	4.1.5 state measures to prevent animal diseases from affecting humans.	Prevention of transfer of animal diseases to humans.	discuss how to ensure animal diseases do not affect humans	Outline the effects of a named zoonotic disease on human health.

SECTION 5

GENETIC PRINCIPLES AND ANIMAL IMPROVEMENT

General Objectives: The student will:

1. be aware of the principles of animal improvement
2. appreciate the relationship between breeding, nutrition and productivity
3. appreciate the need for Artificial Insemination in animal production
4. be aware of the processes in Artificial Insemination.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 **HEREDITY AND ANIMAL IMPROVEMENT**	The student will be able to: 5.1.1 explain heredity and basic terms associated with it.	Heredity and Associated Terms	Students to: explain the basic terms in genetics. eg. gamete, chromosome, gene, allele, trait, genotype, phenotype, sex-linkage dominant character, recessive character observe models/charts/films/ pictures of chromosomes showing processes of cell division and multiplication to explain the concept of heredity. **NOTE:** Simple treatment of Mendel's first law of inheritance is required	Explain how farm animals pass on certain traits to their offspring. Mention two ways in which the application of genetics is beneficial to animal husbandry. A pure breeding black coloured rabbit, BB was crossed with a pure breeding white rabbit bb. By means of diagrams only show the genotypes of the offspring up to the second filial generation
	5.1.2 explain animal improvement.	Meaning of Animal Improvement: - Production of animals with better desirable traits of offspring over parents.	brainstorm to bring out the meaning of animal improvement. give reasons for selecting a particular trait for improvement	Select with reasons few economically important traits for improvement in different farm animals
	5.1.3 state the objectives of animal improvement.	Objectives and benefits e.g. increase in number of animals, increase in profit, increase in animal products, etc.	state the objectives of animal improvement and give examples of benefits derived from improvement.	

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D)	The student will be able to:		Students to:	
HEREDITY AND ANIMAL IMPROVEMENT	5.1.4 compare the performances of a named improved farm animal with an unimproved one.	Genotype and performance comparison based on performance traits e.g. milk yield, egg size,	analyse data provided by the teacher to determine the superiority of the improved type over the un-improved type e.g. egg production, bird mortality.	List four (4) benefits of animal improvement to the farmer.
UNIT 2				
METHODS OF ANIMAL IMPROVEMENT	5.2.1 describe the various methods of animal improvement.	Methods of Animal Improvement: - Introduction - Selection - Breeding	discuss the various methods of animal improvement select a few best animals from indigenous types using fixed criteria	Outline the advantages and disadvantages of animal improvement methods.
	5.2.2 state the advantages and disadvantages of the various animal improvement methods.	Advantages and disadvantages of animal improvement methods.	state the advantages and disadvantages of the various animal improvement methods discuss types of breeding, e.g. cross breeding and line breeding and the nutritional and environmental factors that affect animal improvement.	
	5.2.3 explain how selection improves the genetic make-up of animals.	Improvement of genetic make-up through selection	introduce exotic cock into a group of selected indigenous hens and hatch eggs. Compare the chicks with the indigenous chicks	Discuss how genetic selection improves the performance of local chicken and how the improved performance can be sustained.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 (cont'd) **METHODS OF ANIMAL IMPROVEMENT**	The student will be able to: 5.2.4 explain artificial insemination as a breeding technique.	Explanation of artificial insemination.	Students to: brainstorm to bring out the meaning of artificial insemination.	What is artificial insemination?
	5.2.5 describe the technique of artificial insemination and name the equipment used.	Artificial insemination technique - Semen collection, screening, processing, storage and use.	discuss technique of artificial insemination and mention the equipment used. **NOTE:** Teacher to use audio-visual aids /field trips to illustrate artificial insemination technique	How is semen for artificial insemination obtained and stored?
	5.2.6 state the advantages and disadvantages of artificial insemination.	Advantages and disadvantages of artificial insemination <u>Advantages</u> -No male needed -STD"s minimised, etc. <u>Disadvantages</u> -Expensive equipment -Needs expertise, etc	discuss the advantages and limitations in the use of artificial insemination	Discuss the limitations and prospects of artificial insemination in developing countries.
	5.2.7 describe signs of heat for effective insemination.	Signs of Heat. -Restlessness -Enlarged and reddened vulva -Mounting other animals, etc.	make observations and describe the signs of heat of various farm animals.	Explain the relationship between heat detection and success rate of artificial insemination

SENIOR HIGH SCHOOL - YEAR 1

SECTION 6

DOMESTIC PETS

General Objectives: The student will:

1. recognize the importance of pets to humans
2. acquire skills in the production and marketing of pets**.**

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 **DOMESTIC PETS**	The student will be able to: 6.1.1 explain the term "pet" and give examples.	Explanation and examples of pets	Students to: brainstorm to come up with the explanation for "pet". mention the types of pets they know or have read about (parrots, pigeons, etc)	Describe your favourite pet and share your pleasant and sad experiences with it with the class.
	6.1.2 identify the functions of pets and state their importance.	Functions and importance of pets Eg. security, income, control of pests, etc.	discuss the roles and importance of pets in society. (security, income, shepherding, companionship, hunting, messengers, control of pests) share their experiences with pets (e.g. guide dogs, security dogs, companions etc.) with the class	State five (5) important roles of pets in the home.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1(Cont'd) **DOMESTIC PETS**	6.1.3 describe management practices involved in the production of pets.	Management of pets: - Housing - Feeding - Sanitation - Breeding - Pests and disease control -Grooming and care	discuss the various management practices in raising pets discuss the need to licence pets and vaccinate them regularly against rabies.	What are the management practices involved in keeping dogs? After a visit to the Veterinary Services Department, students to give oral account of a) pets observed b) diseases vaccinated against c) practices in pet handling
	6.1.4 train pets for appropriate purposes.	Methods of training pets	discuss animal behaviour and training requirement for pets. **NOTE:** Teacher to invite resource person to give a talk on training pets.	
	6.1.5 outline strategies for marketing pets.	Value chain and marketing of Pets.	discuss value – chain process of marketing pets plan marketing schedule and work it into production and training of pets deliver quality pets to customers	Give reasons why pets are to be properly trained and vaccinated? **PROJECT:** Interview 10 people who keep pets to obtain the following information • Type of pet • Why prefer a particular pet • Name of pet • Feed offered and number of times fed per day • Problems of keeping pets and possible solutions • The prospects of the pet industry in the locality? Explain the need for a linkage between the producer and buyer of pets.

SENIOR HIGH SCHOOL - YEAR 2

SECTION 1

ANATOMY AND PHYSIOLOGY OF FARM ANIMALS

General Objectives: The student will:

1. appreciate the functions of the skeletal and muscular systems of farm animals
2. recognize the reproductive system and reproduction in farm animals

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Students to:	
INTEGUMENTARY, SKELETAL AND MUSCULAR SYSTEMS	1.1.1 describe the integumentary (skin), skeletal and muscular systems of farm animals.	Structure of the integumentary (skin), skeletal and muscular systems.	observe charts/models of the skin, skeletal and muscular systems of various farm animals	Draw and label the skin State three (3) skeletal differences between chicken and goat.
	1.1.2 identify parts of the skeletal and muscular systems.	Skeletal and muscular systems	identify the parts of the skeletal and muscular systems. describe how the muscles of the forelimb of the cow aid its movement	**PRESENTATION** A group of students to give a presentation on joints in farm animals and their functions.
	1.1.3 state the functions of the skin, skeleton and muscles.	Functions of the skin, skeleton and muscles: Skin – for protection, insulation, temperature regulation, excretion, etc. Skeleton – for protection, body support. Muscles – for movement.	discuss the functions of the skin, skeleton and muscles	State three (3) functions of the skin of a named farm animal.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 **REPRODUCTIVE SYSTEM**	The student will be able to: 1.2.1 draw and label the parts of the reproductive system in a named farm animal.	Anatomy of the reproductive organs in poultry and livestock.	Students to: observe and describe the main features of the reproductive systems in livestock and poultry. **NOTE:** Discussion should include functions (use charts/live specimen) brainstorm to bring out the meaning of common terms used in reproduction. e.g. puberty, oestrous cycle etc.	Draw and label a male/female reproductive system of a named farm animal. Explain the following terms: - oestrous -anoestrous - ovulation - fertilization - libido - mating
	1.2.2. distinguish between reproductive processes in poultry and livestock.	Reproduction in; -poultry, -pigs - sheep - goats - cattle and -rabbit.	discuss the stages and processes of reproduction (from mating to parturition.) state the differences between the reproductive processes in poultry and livestock **N.B.** Role of reproductive hormones should be highlighted e.g. oestrogen, progesterone, testosterone describe oestrus in a named livestock species undertake a visit to a ranch or a pen to identify pregnant animals and to record signs shown by animals close to parturition.	Explain the functions of oestrogen, progesterone, testosterone in reproduction Mention five signs of heat in farm animals. List 3 signs of approaching parturition in a named farm animal

SENIOR HIGH SCHOOL - YEAR 2

SECTION 2

ANIMAL NUTRITION

General Objectives: The student will:

1. acquire skills for the formulation and preparation of animal feeds
2. be familiar with the procedures for proper handling and storage of animal feeds.
3. appreciate the importance of the establishment and management of pasture, conservation of forage and effects of invasive species.
4. acquire skills in establishing and managing pasture and conservation of forage.

UNIT	SPECIFIC OBJECTIVES	CONTENTS	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 **FORMULATION AND PREPARATION OF ANIMAL FEEDS**	The student will be able to: 2.1.1 explain common terms in animal feed formulation.	Explanation of terms: - Dry matter, -Diet, - Metabolisable Energy - Malnutrition, etc.	Students to: brainstorm and bring out the meaning of terms used in ration formulation.	Define the following terms: - Ration - Dry matter - Maintenance Ration - Production Ration - Diet
	2.1.2 explain the factors considered in the formulation of rations.	Factors considered in formulating rations e.g. age, condition of animal, etc.	discuss the factors considered in the formulation of rations.	
	2.1.3 state the steps involved in formulating rations for animals of different ages.	Steps in formulating rations	undertake a field trip to a nearby feed mill/farm to observe formulation and mixing of feeds.	Students to write report on the feed mill/farm visited. Students to work in groups to produce balanced ration for specified animals.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D) **FORMULATION AND PREPARATION OF ANIMAL FEEDS**	The student will be able to:		Students to: use the Pearson Square Method to formulate feed rations for different types of farm animals. weigh and mix feed accurately.	**PROJECT:** Use 20 six weeks old cockerels of the same strain to compare two diets, A and B. (Diet A; Low energy, high fibre, high protein, Diet B; high energy, low fibre, high protein.) Feed birds for one month and record feed intake and bird weight weekly. Calculate the cost of feeding the cockerels and explain your observations
UNIT 2 **HANDLING AND STORAGE OF ANIMAL FEEDS**	2.2.1 explain the need for good storage and handling practices for feed.	Feed Storage and Handling	state the need for feed storage and discuss the features of different storage structures/ containers.	State four (4) factors that affect the quality of animal feeds in storage.
	2.2.2 state the factors that affect the quality of stored feeds.	Factors affecting the quality of stored feed	brainstorm to bring out the factors that affect the quality of feed in storage and actions to maintain quality of stored feed.	
	2.2.3 estimate the cost of prepared feed.	Estimation of cost of prepared feed.	estimate the cost of prepared feeds.	What is the importance of keeping feed records in poultry production?
	2.2.4 keep records of feed.	Records on animal feeds.	develop a format for keeping feed records.	
	2.2.5 state the effects and control of pests of stored feeds.	Effects and Control of pests on stored feed: - damage, contamination etc.	describe the effects of pests on stored feeds. discuss the prevention and control measures of pests of stored feed.	Discuss the economic effects of pests of stored feed.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 **PASTURE ESTABLISHMENT AND MANAGEMENT**	The student will be able to: 2.3.1 state the attributes of good pasture species.	Qualities of good pasture species -High productivity eg. grows fast and easily propagated -High palatability i.e. tasty and attractive -Adapted to local climatic conditions, etc.	Students to: undertake a visit to a pasture or grazing land to observe the attributes of a good pasture. discuss the attributes of good pasture species and give examples. collect samples of forage crops with desirable attributes e.g. guinea grass, stylosanthes, (grows fast, etc) for study	State three (3) attributes of good pasture species.
	2.3.2 outline the cultural practices used in pasture establishment.	Cultural practices in pasture establishment -Land preparation -Fencing -Sowing/planting -Control of weeds, pests and diseases -Watering, etc.	discuss the cultural practices in pasture establishment e.g. land preparation, fencing, sowing/planting, control of weeds, pests and diseases, watering etc.	
	2.3.3 describe ways of improving natural pastures.	Improving natural pastures -Over-sowing with legumes -removing undesirable species, etc.	discuss the need to improve natural pastures and how it is done.	State four (4) management practices for improving pastures

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 (CONT'D) **PASTURE ESTABLISHMENT AND MANAGEMENT**	The student will be able to: 2.3.4 give examples of invasive alien species in pastures.	Examples of invasive species on pastures Characteristics: aggressive growth, exhibit allelopathy, large quantity of seeds, extensive root system, withstand adverse conditions	Students to: brainstorm to come out with examples of invasive alien species in pastures and describe their characteristics identify invasive species on pastures. E.g. *Chromolaena odorata* (siam weed), *Lantana camara* (Spanish flag), *Mimosa pigra* (mimosa), *Azadirachta indica* (neem) discuss the characteristics of invasive species.	.
	2.3.5 analyse the effects of invasive species on pastures.	Effects of Invasive Alien Species on pastures - Compete with pasture plants for nutrients, water, light, etc - Some are poisonous to livestock - Reduction in productivity of pastures, etc.		Discuss three effects of invasive alien species on pastures
	2.3.6 plan and carry out the practices associated with the establishment and management of pasture.	Establishment and Management of pasture -Regulate grazing to avoid overgrazing -Adopt proper stocking rate -Sanitation/fight against parasites -Disease prevention -Fire belts	plan a project to establish and manage a pasture measuring 6m x 4m discuss the management practices for pasture establishment carry out the relevant cultural practices keep records of all activities undertaken give reasons for adopting proper stocking rate state the merits and demerits of the different methods of propagating forage crops store seeds for future use. visit an established farm where pasture rotation and other management practices are observed for students to appreciate its usefulness	Justify the statement “Pasture production is the backbone of successful ruminant production”. Explain the procedure to follow in the establishment of a cultivated or artificial pasture. Write and present a report on the visit in class

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 4 **FORAGE CONSER-VATION AND UTILIZATION**	The student will be able to: 2.4.1 explain forage conservation.	Forage conservation Examples of conserved forage; hay, silage, etc.	Students to: produce and process pasture seeds. identify different forms of conserved forage. distinguish between hay and silage with respect to their physical, chemical and nutritional properties.	Define: Hay Silage Pellets Baled straw
	2.4.2 outline the importance of forage conservation and utilization.	Importance of conserved forage and utilization:	discuss the importance of conserved forage for animal production	Justify the use of conserved forages in ruminant production.
	2.4.3 explain how age of herbage affects its nutritive value.	Effect of age on nutritive value of herbage.	explain the relationship between age of herbage and its nutritive value.	
	2.4.4 use crop residue for feeding ruminants.	Feeding crop residues e.g. groundnut haulms, cassava/plantain peels, etc.	discuss the collection, preservation and precautions associated with the use of crop residues.	Name (5) crop residues used for feeding ruminants. What pre-cautions should be taken when using such crop residues. Discuss the merits and demerits of using crop residues for feeding animals
	2.4.5 prepare hay and silage.	Preparation of hay and silage	be guided by the teacher to prepare hay and silage discuss the stage at which the forage crop should be harvested discuss the importance of additives in silage preparation give reasons for compacting the cut forage in silage preparation state the precautions to be taken in preparing hay and silage	Outline the steps in hay processing.

SENIOR HIGH SCHOOL - YEAR 2

SECTION 3

ANIMAL HEALTH

General Objectives: The student will:

1. recognize ecto- and endo-parasites of farm animals
2. appreciate the economic importance of parasites in animal production
3. acquire skills in the prevention and control of parasites of farm animals.
4. recognize pathogens of farm animal diseases
5. be aware of the principles underlying the prevention and control of farm animal diseases
6. acquire skills to prevent and control farm animal diseases.

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UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Students to:	
ECTO AND ENDO-PARASITES OF FARM ANIMAL	3.1.1 identify common types of parasites.	Types of parasites Endo-parasites eg. tapeworm, roundworm, etc. Ecto-parasites eg. ticks, lice, etc.	define parasite and give examples discuss important endo- and ecto-parasites and the animals they infect. Observe live or preserved specimens. Identify types of ecto- and endo-parasites, aided by charts/live/preserved specimens.	List the common types of ecto- and endo-parasites. Describe the structure, mode of feeding and infestation site of a named ecto parasite.
	3.1.2 describe the life cycles, mode of feeding and infestation site of ecto- and endo-parasites.	Life cycles of common ecto- and endo-parasites	describe life cycles, modes of feeding, infestation sites and effects on the host of common types of endo- and ecto-parasites.	Draw and label the life-cycle of the tapeworm/roundworm.
	3.1.3 explain the conditions that influence parasite population.	Conditions that influence parasite populations	brainstorm to come up with conditions that affect parasite population dynamics.	Discuss how the population of a named parasite could be reduced by changing its micro-environment.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEAVING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D) **ECTO AND ENDO-PARASITES OF FARM ANIMAL**	The student will be able to: 3.1.4 plan and carry out prevention and control measures against common parasites.	Prevention and control of parasites; a) deworming/drenching b) spraying/dipping/dusting/pour-on c) farm sanitation d) pasture rotation e) quarantine	Students to: discuss prevention and control measures against parasites institute good farm sanitation procedures. use appropriate equipment and chemicals to carry out control practices on a livestock farm. restrain animals correctly to avoid harm read the drug's label to administer correct quantity of dewormer identify treated animals to avoid double dosing. be guided to carry out dusting, dipping and spraying of farm animals.	Groups of students to describe the procedures involved in drenching or spraying sheep infested with parasites. . Give two reasons for properly restraining animals during drenching. Discuss the advantages of using "pour-ons" or "spot-ons" instead of dips to control external parasites.
	3.1.5 outline the economic importance of endo- and ecto-parasites.	Economic importance of endo- and ecto- parasites a) Ecto-parasites cause damage to skin and hides, suck blood from animal leading to loss of weight, anaemia, etc. b) Endo-parasites cause damage to internal organs and tissues eg. liver flukes damage liver, etc.	discuss the economic importance of endo- and ecto- parasites	Discuss the economic importance of ecto- and endo-parasites

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 **PATHOGENS OF FARM ANIMAL**	The student will be able to: 3.2.1 state the classes of pathogenic organisms in farm animals. 3.2.2 mention examples of diseases caused by pathogens.	Classification of disease- causing organisms: - viruses - bacteria - fungi - protozoa Pathogenic diseases of farm animals.	Students to: discuss the classification of pathogens. **NOTE:** Teacher to use diagrams/charts/slides/microscope to highlight differences in pathogens. Observe pathogens using microscope **NOTE**: Teacher to demonstrate the use of microscope. Give examples of important/common pathogenic diseases of farm animals. State the economic importance of diseases in farm animals	Mention four (4) classes of pathogens in farm animals and give examples of diseases caused by each.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 **PRINCIPLES OF PREVENTION AND CONTROL OF FARM ANIMAL DISEASES**	The student will be able to: 3.3.1 explain the basic principles for the prevention and control of farm animal diseases. 3.3.2 mention management practices used to prevent and control farm animal diseases.	Basic principles of prevention and control of diseases: (nutrition, vaccination, sanitation, etc) Management practices in the prevention and control of farm animal diseases -Physical barrier eg. regular laboratory analysis of faecal and blood samples of live animals.	Students to: discuss the principles of prevention and control of diseases with respect to cost, suitability and efficacy. be guided in the use of prophylactics to prevent and control farm animal diseases e.g. coccidiostats, antibiotics, anti-stress drugs, vitamins. **NOTE:** Teacher to invite a resource person to give a talk on disease prevention and control and to demonstrate the treatment of diseases. Precautions in the use of drugs and chemicals should be highlighted. practise deworming , dipping, dusting, treatment of wounds and sores, etc. practise spraying and fumigation of animal houses. administer drugs to sick animals in school farm/home	Mention 2 chemical substances recommended for spraying animal houses. **DEBATE:** Viral diseases of farm animals cause more harm to farmers than bacterial diseases

SECTION 4

MONOGASTRIC PRODUCTION

General Objectives: The students will:

1. recognize types and breeds of pigs
2. acquire skills for the production and marketing of pigs.
3. develop knowledge and skills to care for and manage poultry.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 **PIG PRODUCTION**	The student will be able to: 4.1.1 list the types and breeds of pigs.	Types and breeds of pigs Types: Bacon, Lard, Pork Breeds: Yorkshire, Ashanti Black, Large White, Landrace, etc.	Students to: discuss the types and breeds of pigs. **NOTE:** Discussion should include characteristics of breeds of pigs	Give two examples of breeds of pigs in Ghana.
	4.1.2 appraise the importance of pig production in the economy.	Importance of pig production in the economy -Source of employment, income, lard used in pharmaceutical products, etc.	mention the nutritional value of pork in the growth and development of humans discuss the use of lard, bristles, bones and manure in agriculture and industry	State the advantages and disadvantages of the following systems of management: a. Intensive b. Semi-Intensive c. Extensive
	4.1.3 describe the systems of keeping pigs.	Management systems for pig production -Intensive -Semi-intensive -Extensive	describe the various management systems seen during the visit.	

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D) **PIG PRODUCTION**	The student will be able to: 4.1.4 plan and manage effectively the production of pigs.	Management practices: - Housing - Feeding - Breeding - Sanitation - Disease and pest control -Identification -Records keeping -Processing and marketing	Students to: identify the requirements using a value chain approach for producing pigs discuss the management practices undertake an educational visit to an established piggery to observe management systems and practices. construct a suitable pen/sty and manage pigs work in groups to draw pig breeding plans and record keeping formats. **NOTE:** Invite a veterinary officer or technician to demonstrate the process of castration in piglets for students to observe and practise.	Explain the following terms -Creep feeding -Farrowing -Weaning -Barrow Describe the process of castration in piglets. Discuss measures to control and prevent pig diseases. Write a report on the field trip highlighting the management practices on the farm Interview pig farmers in the locality to find out some of the factors necessary for successful pig farming
	4.1.5 process pigs for the market.	Slaughtering, Processing and Marketing of pigs -Slaughtering and processing -Quality control -Packaging -Storage -Marketing outlets -Advertisements etc.	discuss techniques involved in the processing and marketing of pigs/pork to ensure meat quality and safety. visit abattoir and observe slaughtering, processing and marketing of pork. - .	Describe the process of bacon making.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 **POULTRY PRODUCTION (CHICKEN)**	The student will be able to: 4.2.1 define the term poultry and describe their characteristics.	Definition and characteristics of poultry. - Presence of beak, feathers, wings, etc.	Students to: brainstorm and bring out the meaning of poultry. discuss the characteristics of poultry.	Students to state five (5) characteristics of poultry that distinguish them from other farm animals.
	4.2.2 state the types and breeds of chicken.	Types and breeds of chicken <u>Types:</u> Egg-producing, meat producing and dual purpose <u>Breeds</u> Rhode island red, white Leghorn, etc.	describe different types and breeds of chicken. Pictures, video clips could be used.	
	4.2.3 describe the various systems of keeping poultry.	Systems of poultry-keeping - Extensive - Semi-Intensive - Intensive	discuss the different systems of poultry-keeping. visit different poultry farms to observe the different systems. discuss the advantages and disadvantages of each system.	Describe one of the following systems of keeping poultry: i. Deep litter ii. Battery cage iii. Coop and a run iv. Free range .

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 (CONT'D) **POULTRY PRODUCTION I (CHICKEN)**	The student will be able to: 4.2.4. plan and manage effectively the production of chicken.	Management practices: - Housing - Breeding - Brooding - Feeding - Sanitation - Pests and disease control -Identification -Records keeping, etc.	Students to: identify the requirements using value chain approach for producing poultry discuss the management practices undertake a field trip/ educational visit to established poultry farm to observe the management practices being carried out by the farmer. construct a simple chicken coop ($6m^2$) - clean, disinfect and provide waterers/feeders, and day old chicks at correct density carry out poultry management practices at the school or a nearby poultry farm. **NOTE**: Skills development should include the following: - brooding, debeaking, vaccine administration, culling, feed preparation, feeding, etc Arrangement may be made for practical attachment during holidays.	Discuss the following poultry management practices: Brooding Medication Housing Sanitation. State four preparations one should make before receiving day old chicks. **PROJECT** • Take the dimensions of the different houses for birds • Find the strain, age and number of birds in the house • Find out the number of feeders and waterers • Calculate area occupied by i) feeders and waterers ii) birds • Determine whether the stocking density is appropriate • Present your observations and calculations in class

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 (CONT'D)	The student will be able to:		Students to:	
POULTRY PRODUCTION I (CHICKEN)	4.2.5 plan the marketing strategies involved in chicken production.	Processing and Marketing Techniques: - Slaughtering and Processing - Quality Control - Packaging - Preservation and Storage - Marketing outlet -Transportation - Advertisement	discuss processing and marketing techniques.	Outline four (4) marketing techniques in chicken production.
UNIT 3				
POULTRY PRODUCTION II (DUCKS, TURKEYS, GUINEA FOWLS AND OSTRICHES)	4.3.1 identify common breeds of ducks, turkeys, guinea fowls and ostriches.	Common breeds of ducks, turkeys, guinea fowls and ostriches.	describe the common breeds of ducks, turkeys, guinea fowls and ostriches.	Mention the common breeds of ducks, turkeys guinea fowls and ostriches
	4.3.2 give reasons why the production of ducks, turkeys, guinea fowls and ostriches can be viable enterprises.	Importance of ducks, turkeys, guinea fowls and ostriches	discuss the importance of ducks, turkey, guinea fowls and ostriches.	
	4.3.3 plan and manage effectively the production of ducks, turkeys, guinea fowls and ostriches.	Management Practices: - Housing - Breeding - Feeding - Sanitation and Health -Identification -Record keeping -Processing and Marketing	discuss different management practices undertake a field trip to established duck, turkey, guinea fowl and ostrich production farms to observe differences in their management practices. Write a report on the field trip. carry out the management practices on a chosen flock in school farm/home.	Write a report on the prospects of marketing ducks, turkeys, guinea fowls and ostriches. (Pay attention to types of consumers, packaging, capital and possible revenue)

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 4 **INCUBATION AND HATCHERY PRACTICE**	The student will be able to: 4.4.1 describe natural and artificial incubation.	Natural and Artificial incubation	Students to; describe natural and artificial incubation. state the advantages and disadvantages of each method. brainstorm and come out with definitions for the following: fertile egg, hatchability, incubation, broodiness, candling, etc. state the conditions necessary for high hatchability under natural and artificial incubation	Differentiate between artificial and natural incubation. Discuss the conditions necessary for successful incubation of turkey eggs. Explain the following terminologies in hatchery practice: Incubation, candling, hatchability .
	4.4.2 state the characteristics of eggs to be selected for incubation.	Characteristics of eggs selected for hatching -not cracked -correct shape (oval) -correct size/weight -not double yolked etc.	describe the characteristics of eggs to be selected for incubation. select suitable eggs for hatching from among a group of eggs provided. give reasons for selecting some and discarding others.	State four (4) egg qualities/characteristics suitable for incubation
	4.4.3 candle and incubate eggs for hatching.	Candling of Eggs.	state and compare the incubation periods for chicken, ducks, turkeys and guinea fowls observe a demonstration on the procedure for candling eggs.	State the incubation period for chicken, ducks, turkeys and guinea fowls

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 4 (CONT'D) **INCUBATION AND HATCHERY PRACTICE**	The student will be able to: 4.4.4 plan a disease free chick production scheme.	Hatchery layout and hygienic practices in the production of chicks, ducklings, poults and keets e.g. fumigation, disinfection, etc.	Students to: visit a hatchery and observe its layout and operations. hatch eggs using a simple incubator and calculate hatchability and weigh day-olds	How do you ensure that disease organisms do not affect the chicks you produce from your incubators. Name four (4) types of disinfectants and one vaccination employed in a hatchery.
	4.4.5 describe marketing techniques for day-old chicks.	Marketing of day-old chicks.	discuss the marketing techniques and outlets for day-old chicks. list some major suppliers of day-old chicks	State the precautions needed in the transport of day old chicks

SENIOR HIGH SCHOOL - YEAR 2

SECTION 5
INTRODUCTION TO ENVIRONMENTAL PHYSIOLOGY OF FARM ANIMALS

General Objective: The student will:

1. be familiar with environmental physiology of farm animals.
2. be aware of the environmental effects on farm animals
3. develop the skills in creating suitable environment for farm animals.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 **INTRODUCTION TO ENVIRONMENTAL PHYSIOLOGY**	The student will be able to: 5.1.1 state constituents of an animal's internal and external environment.	Internal and External environment of animals Internal environment e.g. body temperature, blood glucose level, etc. External environment e.g. climatic parameters like temperature, humidity, etc.	Students to: brainstorm to come out with the physical and chemical constituents of the animal's internal and external environment eg. body temperature, climatic parameters like humidity, ambient temperature, etc. explain normal concentrations or values of blood metabolites, respiration and heart rates and body temperature of farm animals. Use charts, tables, etc.	Distinguish between the internal and external environments of an animal and state two important parameters of each type of environment**.**
	5.1.2 describe how animals become aware of changes in their environment.	Awareness of sensations - Nervous system - Endocrine system	discuss the role of the nervous and endocrine systems in creating environmental awareness.	
	5.1.3 outline how the nervous and endocrine systems act to enable the animal adjust to changes in its environment.	Role of the nervous and endocrine systems in homeostasis and animal's response to stimuli.	discuss the role of the nervous system in the maintenance of normal body temperature of farm animals.	Discuss the role of the nervous system in the maintenance of normal body temperature of farm animals.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D) **INTRODUCTION TO ENVIRONMENTAL PHYSIOLOGY**	The student will be able to: 5.1.4 determine the room temperature, body temperature and respiration rate in farm animals.	Measurement of temperature, humidity, respiration rate, heart beat , etc and equipment used.	Students to: discuss the physiological and behavioural responses of animals to heat, cold, exercise, etc. observe behaviour of farm animals under hot and cold conditions on a farm measure respiration rate and rectal/body temperature of sheep and chicken and room temperature of farm houses exposed to heat and cold. take above measurements on themselves after; (a) running for 10 minutes (b) resting for 20 minutes	Explain the following observed behaviours in dogs and goats i) panting ii) stretching flat out on a concrete floor Name the instrument used to measure relative temperature, humidity, wind speed and temperature. Plot a graph of respiration rates against body weight or height and discuss graphs in a report.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 **ENVIRONMENTAL EFFECTS ON PRODUCTION**	The student will be able to: 5.2.1 explain indirect effects of climate on farm animals. 5.2.2 state the direct effects of climate on farm animals.	Indirect effects of climate on farm animals. Direct effects of climate on farm animals.	Students to: discuss the indirect environmental/climatic effects on livestock. e.g. disease prevalence, feed quality and quantity. discuss the direct effects of climate on farm animals. discuss climatic effects on breeding and reproduction: heat detection, abortions, birth-weight, animal survival, lactation. discuss the effects of ambient temperature on feed and water intake and growth. use charts or graphs to relate ambient temperature to comfort zone temperatures of different classes of stock .	State three (3) modes of heat loss in pigs, poultry and cattle. List four (4) effects of solar radiation on grazing sheep. Explain how climate indirectly affects livestock. List three (3) effects of high temperatures on reproduction.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2(CONT'D) **ENVIRONMENTAL EFFECTS ON PRODUCTION** **UNIT 3** **ENVIRONMENTAL MODIFICATION AND MANAGEMENT**	The student will be able to: 5.3.1 outline ways of modifying animal environment to reduce stress.	Modification of animal environments	Students to: be guided to discuss the concept of thermo-neutral zone and optimum temperatures for farm animal productivity. discuss the effect of high temperatures on growth rate and egg/milk production and quality discuss ways of modifying farm animal environment: - measures should aim at promoting loss of heat to the environment, visit established farms to observe farm layout, orientation of houses and stocking densities.	Tabulate optimum house temperatures for pigs, broilers and dairy cows. List four (4) methods of modifying a sheep's environment to prevent the animal from becoming heat stressed.
	5.3.2 describe features of housing design and layout suitable for hot environments.	Housing design and layout	discuss the features of building design, layout and fittings to aid animal comfort and production e.g. open-sided houses, environmentally – controlled houses, etc.	State the advantages of tall shade. Explain why animal houses in West Africa are oriented in an East-West direction.
	5.3.3 list different feeding strategies for producing poultry and livestock in hot environments.	Feeding strategies under hot/cold conditions.	explain rationale for modifying feeds and times of feeding different classes of stock to overcome heat stress and promote production.	Explain why you feed goats less fibrous feeds during hot weather.
	5.3.4 apply management strategies to minimise stress on animals.	Strategies to minimise stress	explain why animals eat more food under cold weather. discuss suitable times to carry out routine practices such as feeding, vaccination, etc to minimise stress on animals.	Write a report on a field visit to a farm and comment on the suitability of the layout and flock densities observed

SENIOR HIGH SCHOOL - YEAR 3

SECTION 1

ANATOMY AND PHYSIOLOGY OF FARM ANIMALS

General Objectives: The student will:

1. recognize the role of the circulatory, respiratory and excretory systems in maintaining homeostasis
2. be aware of parts of the body which perform circulatory, respiratory and excretory functions
3. develop skills in recognizing signs of ill health in the circulatory, respiratory and excretory systems of the animal

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1	The student will be able to:		Students to:	
CIRCULATORY SYSTEM	1.1.1 describe the structure and functions of the circulatory system of farm animals.	Structure and functions of the circulatory system of farm animals	use a dissected farm animal or charts/models to discuss the parts of the circulatory system of farm animals and their functions draw and label the parts of the circulatory system distinguish between pulmonary circulation and systemic circulation	State the functions of each of the following components of blood a. red blood cells b. white blood cells c. platelets What is lymph?
	1.1.2 interpret changes in the value of the heart or pulse rates in animals.	Heart and pulse rates.	determine the heart or pulse rate of farm animals give an interpretation of the values of the heart or pulse rates	
UNIT 2				
RESPIRATORY SYSTEM	1.2.1 explain the term respiration and state its importance.	Respiration and its importance	explain the term respiration and state its importance	Distinguish between breathing and respiration. Give two signs of ill-health that are associated with diseases of the respiratory system of farm animals

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 (CONT'D)	The student will be able to:		Students to:	
RESPIRATORY SYSTEM	1.2.2 describe the structure and functions of the respiratory system of farm animals.	Structure and functions of the respiratory system of farm animals	use a dissected farm animal or charts/models to discuss the parts of the respiratory system of farm animals and their functions draw and label the parts of the respiratory system of farm animals	
UNIT 3				
EXCRETORY SYSTEM	1.3.1 explain the term excretion and its importance.	Meaning and importance of excretion	brainstorm and bring out the meaning and importance of excretion.	
	1.3.2 describe the structure and functions of the excretory system of a farm animal.	Structure and functions of the excretory system	use a dissected farm animal or charts/models to discuss the parts of the excretory system of farm animals and their functions Draw and label the parts of the excretory system	
	1.3.3 give examples of excretory products in farm animals.	Excretory products	give examples of excretory products in farm animals and the organs that produce them. discuss how the products are eliminated from the body.	Mention the excretory products associated with panting, sweating and urination in the chicken, cow and goat respectively.

SENIOR HIGH SCHOOL - YEAR 3

SECTION 2

RUMINANT PRODUCTION

General Objectives: The student will:

1. recognise breeds of sheep and goats and their characteristics
2. acquire skills for the production and marketing of sheep and goats.
3. acquire skills in beef and dairy production
4. appreciate the contribution of cattle production to the national economy

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 **SHEEP AND GOATS PRODUCTION**	The student will be able to: 2.1.1 identify common breeds of sheep and goats.	Common breeds of sheep and goats. Sheep eg. Nungua Blackhead, Goats e.g. Ashanti black, Sokoto red, etc	Students to: discuss the common breeds of sheep and goats and their geographical distribution in West Africa. **NOTE**: Discussion should include characteristics of the breeds such as body size, nature of hair cover, horn shape, etc. and their distribution, describe distinguishing features between sheep and goats.	Mention four (4) common breeds of sheep/goats. Draw a map of Ghana showing the distribution of sheep and goats Discuss the contributions of sheep and goat production to the national economy.
	2.1.2 state the importance of sheep and goats in the economy.	Importance of sheep and goats -Social e.g. religious, cultural -Economic e.g. income, hides and skin for leather, etc. -Nutrition i.e. Meat for food, etc	brainstorm to identify important contributions of sheep and goats to family/national income.	
	2.1.3 plan and manage effectively the production of sheep and goats.	Management Practices - Housing - Feeding - Sanitation - Disease and Pest Control - Identification - Breeding - Record keeping -Processing and marketing	identify the requirements using a value chain approach for producing sheep and goats outline management practices in sheep and goat production. undertake a project in sheep/goat production in the school/community.	Write a report on the project undertaken high-lighting the following management practices: - Housing - Feeding - Sanitation and - Disease control

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D) **SHEEP AND GOAT PRODUCTION**	The student will be able to:		Students to: describe signs/symptoms of some parasitic infections and diseases of sheep and goats draw up schedules for preventing diseases such as Anthrax, PPR, Bloat, Foot rot, Mastitis, Salmonellosis and parasitic infections restrain sheep/goats properly for observation and treatment castrate sheep/goats properly using a burdizzo **NOTE**: Teacher to invite the Veterinary Technician to demonstrate castration and hoof trimming of a goat/sheep. outline the merits of hoof trimming. determine the ages of sheep/goats by dentition adopt cost-effective feeding and disease control strategies in producing sheep/goat.	Outline five (5) ways of preventing the following: - Tick infestation - Worm infestation How will you prevent high lamb mortality in your flock? **PROJECT:** Students in groups to interview 20 households to obtain the following data and present findings in class • Number of goats and sheep owned • Sex and age of owner • Breeds kept • Management systems, problems and solutions • Type of feeds offered • Age animals reach puberty • Channels of marketing • Annual turn-over Discuss the relationship between age and dentition in sheep/goats.
	2.1.4 outline the marketing techniques in sheep and goat production.	Processing and Marketing Techniques: -Slaughtering and processing -Quality control -Preservation and storage -Marketing outlets -Packaging -Advertising	discuss the techniques involved in the processing and marketing of sheep and goats to ensure meat quality, safety and consumer satisfaction describe methods of meat preservation and storage	Outline the importance of each of the following in the marketing of sheep and goat products: a) Packaging b) Advertising c) Preservation d) Production quality

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 **BEEF CATTLE PRODUCTION**	The student will be able to: 2.2.1 describe beef breeds and major beef cattle production systems. 2.2.2 appraise the importance of beef cattle production in the economy. 2.2.3 describe the management systems for beef cattle production	Beef breeds and beef cattle production systems Importance of beef cattle production in the economy. Management systems of beef cattle production	Students to: explain the link between beef as a food item and the categories of cattle that supply beef: e.g. bulls, cows, steers, bullocks, etc. give the characteristics and general structure of beef breeds; name some beef breeds common in West Africa, and Europe. e.g. N'dama, Gudali, Angus, Hereford mention the nutritional value of beef in the growth and development of humans discuss the use of hides, horns, bones and manure in agriculture and industry. provide examples of the social and economic value of beef and live cattle in the economy describe the common production systems for beef cattle e.g. extensive, pastoral, agro-pastoral, semi-intensive, intensive (feedlot, pastures) etc. identify the strengths and weaknesses of each system undertake a field trip to an established cattle farm, University cattle farm, etc. to observe management systems and cattle breeds.	Students to obtain information from the internet and other sources on beef production, major producing countries and beef breeds. Project: Students visit local abattoir and meat market and report on the following: (i) number of cattle slaughtered per month (ii) weight of carcasses (iii) reasons for rejecting carcasses (iv) sanitary conditions at the abattoir and meat market (v) price of beef. Discuss the challenges facing the different production systems under globalisation and global warming. Give reasons for selecting one of the following breeds for beef production in Ghana; N'dama, Sanga, West African Short horn.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 (CONT'D) **BEEF CATTLE PRODUCTION**	The student will be able to: 2.2.4 plan and manage the production of beef cattle for meat and traction.	Planning, production and managing cattle for beef and traction	Students to: identify the requirements, using a value chain approach, for producing beef cattle select the management system, foundation stock practise effective and efficient husbandry techniques practise fattening of selected animals to market at early ages	Give at least five reasons for planning beef production with the interest of the consumer and producer considered at the onset. State four reasons for giving supplementary feed to pregnant and lactating cows.
	2.2.5 outline the marketing techniques in beef cattle production	Processing and marketing techniques: - Slaughtering and processing - Quality control - Packaging - Preservation and storage -Marketing outlets - Transportation - Advertising	discuss the techniques involved in the processing and marketing of cattle/beef to ensure meat quality and safety. visit abattoirs to observe slaughtering and processing of carcasses visit retail outlets, super markets, cold stores to observe packaged meat products and their prices.	Discuss three problems each of processing and marketing of cattle
	2.2.6 process beef into 'khebab'	Processing of beef into 'khebab' - slice meat into small pieces - grind fresh pepper and onion and mix with salt and spice - obtain small sticks from palm fronds - skew the meat (arrange meat on sticks) - spread the pepper mixture on the meat - grill the meat (keep turning until grilled)	discuss the processing of beef into 'khebab'	

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 (CONT'D) **BEEF CATTLE PRODUCTION**	The student will be able to: 2.2.7 use bulls for Traction	Animal traction/draught	Students to: list qualities of bulls to be selected for traction observe training process and traction by yolked cattle practise use of cattle to cultivate field or pull cart.	Project: Students to visit bullock training facility to observe training and use of yolked animals and report their observations.
	2.2.8 identify major problems in beef cattle production.	Problems of beef cattle production	discuss the negative results of poor management of beef cattle on the environment brainstorm to identify problems e.g. feed and water shortages, cattle theft, pests, etc. in beef cattle production suggest feasible solutions to the identified problems.	discuss the negative results of poor management of beef cattle on the environment brainstorm to identify problems e.g. feed and water shortages, cattle theft, pests, etc. in beef cattle production suggest feasible solutions to the identified problems. State five (5) problems cattle producers encounter in your Region.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 **DAIRY CATTLE PRODUCTION**	The student will be able to: 2.3.1 describe the features of dairy cows and give examples of dairy cattle breeds. 2.3.2 state the characteristics, sources and importance of milk.	Breeds and Features of Dairy cattle. Characteristics, sources and importance of milk	Students to: brainstorm to identify features which distinguish the dairy cow from a beef cow; e.g. high milk yield, wedge-shaped structure, etc. give examples of pure and cross bred dairy breeds in tropical and temperate regions. describe fresh milk by its composition, nutritional value and shelf life. suggest sources of milk to include mammals such as goats, sheep, buffaloes, camels, and cattle discuss the importance of milk from dairy cattle to include food, income, employment, trade, etc.	List 5 characteristics of a good dairy cow. Explain why milk is regarded as a complete food for young animals. Use the net to obtain information on the tonnage and dollar value of milk produced in West Africa and the world.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 (CONT'D) **DAIRY CATTLE PRODUCTION**	The student will be able to: 2.3.3 plan dairy cattle production and describe and/or carry out dairy management practices.	Dairy cattle production and management. - Housing - Feeding - Sanitation - Breeding - Pest and disease control -Identification -Records keeping -Processing and marketing	Students to: identify 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 healthy milk, etc. select suitable breeds and management system for dairy cattle. discuss the production of replacement stock carry out good management practices	Give reasons for using crossbred dairy cattle for milk production in some regions of the world. Give two symptoms and one method each for controlling the following diseases of dairy cattle: mastitis, tuberculosis, ketosis. List 5 features of heifers that are selected to replace dairy cows.
	2.3.4 produce, process and market milk and milk products.	Production, processing and marketing of dairy milk and products.	familiarize themselves with the equipment and tools required for milking, milk handling and processing.	Compare the equipment used in a modern milking parlour and the traditional milking shed by Fulani herdsmen

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 3 (CONT'D) **DAIRY CATTLE PRODUCTION**	The student will be able to: 2.3.5 trace the consequences of consuming contaminated milk.	Quality and safety standards in milk processing and marketing: - Inspection of udder/milk - Proper cleaning of udder/milking equipment - Cleanliness in parlour - Pasteurisation of milk -Refrigeration -marketing under hygienic condition	Students to: discuss the practices for ensuring milk quality and safety standards visit dairy farm, retail outlets, super markets to observe milk and milk products and their prices. pasteurize milk and record the procedure clean and sanitize equipment, package, store and market milk visit milk processing enterprise to observe the production of some milk products e.g. yoghurt , cottage cheese, tinned milk, powdered milk, etc.	State any 4 processes that help to improve the shelf-life of milk products.
		Effects of consuming contaminated milk	use Futures Wheel to trace the consequences of consuming contaminated milk	List and explain three effects of consuming contaminated milk.
	2.3.6 outline problems associated with dairy cattle production in warm climates.	Problems of dairy cattle production in warm climates	discuss effects of warm climate on dairy animals and milk production suggest solutions to problems to make peri-urban dairying profitable.	State 5 ways in which you can increase feed intake in dairy cows in warm climates.

SENIOR HIGH SCHOOL - YEAR 3

SECTION 3

NON-TRADITIONAL ANIMAL PRODUCTION

General Objectives: The student will:

1. appreciate the need for the production of non-traditional animals
2. acquire skills for the production of non-traditional animals.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 **RABBIT AND GRASSCUTTER PRODUCTION**	The student will be able to: 3.1.1 identify the common breeds and strains of rabbits and grasscutters.	Common breeds and strains of rabbits and grasscutters	Students to: discuss the common breeds and strains of rabbits and grasscutters.	List the common breeds of rabbit and strains of grasscutter.
	3.1.2 explain basic terminologies.	Basic terminologies	brainstorm to bring out the meaning of related terms such as scalding, pelt, hutch, cub, bunny, etc.	Explain the following terms: Buck, Doe, Bunny, Kindling, Pelt and Litter
	3.1.3 explain the need for rearing rabbits and grasscutters.	Importance of rabbits and grasscutters. -	discuss the nutritional and economic importance of producing rabbits and grasscutters e.g. source of meat, pelts, income, etc.	Discuss the prospects of marketing of grasscutters

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 (CONT'D **RABBIT AND GRASSCUTTER PRODUCTION**	The student will be able to: 3.1.4 plan and manage effectively the production of rabbit and grasscutter.	Management practices (a) Housing (b) Feeding (c) Sanitation (d) Identification (e) Breeding (f) Diseases and pests control (g) Record keeping (h) Processing and Marketing	Students to: identify the requirements using a value chain approach for producing rabbit and grasscutter discuss the production and management practices. visit established rabbit and grasscutter production centres to observe management practices. **NOTE:** Schools are advised to keep rabbits /grasscutters. Audio-visuals may be used to highlight their production. construct suitable hutches and houses for rabbits/ grasscutters produce rabbits/ grasscutters in the school farm or at home. **NOTE:** Teacher to demonstrate the methods of administering medication against pathogens and pests.	Outline the differences in the management practices in rabbit and grasscutter production. Describe how you would; a) prepare a nest box for kindling by a rabbit. b)determine sex of young bunnies and grasscutter. Debate; The potential for grasscutter production in Ghana is greater than that for rabbit. Argue for or against the motion.
	3.1.5 plan the marketing strategies involved in rabbit and gracutter production	Processing and marketing techniques: -Slaughtering and processing - Quality control - Packaging - Preservation and storage - Marketing outlets - Transportation - Advertisement	Discuss processing and marketing techniques explore novel ways of processing rabbits/ grasscutters for the market.	Describe other ways of processing grasscutter apart from singeing

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 2 **SNAIL FARMING**	The student will be able to: 3.2.1 explain snail farming and its importance. 3.2.2 describe the external features of snails. 3.2.3 select the recommended species of snails for farming. 3.2.4 select suitable site for snail farming. 3.2.5 plan and effectively manage a snail farm. 3.2.6 process and market snails	Meaning and importance of snail farming. External features of snails and their functions. Types of snail species used for farming Site selection . Management practices: i) Housing, ii) Feeding iii)Sanitation iv) Breeding, v) Pest and Disease Control vi) Record keeping vii) Processing and marketing Processing and marketing of snails Process snails by smoking - wash and break the shell - remove flesh from shell and wash - skew flesh (arrange flesh on sticks) - leave overnight - smoke on low heat (keep turning until smoked)	Students to: brainstorm to bring out the meaning and importance of snail farming describe the external features of snails. select suitable snail species for farming (e.g. *Achatina achatina, Achatina marginata)* discuss the features to consider in site selection. identify the requirements using a value chain approach for snail farming discuss the management practices. **NOTE:** Teacher to invite a Resource Person to give a talk on snail farming. construct snailery for snails and stock with snail eggs using materials found in the localities carry out the management practices and manage the snails to maturity identify and discuss pests and diseases of snails and outline their control measures describe the techniques involved in the processing, preservation and storage and marketing/export of snails. **NOTE:** Skills development should be emphasised.	Explain the following terms: snailery, juveniles, aestivation and clutch List four (4) uses of the snail shell. draw and label the snail. State three (3) types of housing and six (6) types of feed for snails. Describe how micro-climate created for snails to increase yield State six (6) pests of snails and discuss the control measures. Discuss 4 constraints to snail farming in your locality. Project: Groups of students to process and package snail meat in the dry state for sale

SENIOR HIGH SCHOOL - YEAR 3

SECTION 4

ENTREPRENEURSHIP IN ANIMAL HUSBANDRY

General Objectives: The student will:

1. plan and establish an enterprise based on Animal Husbandry.

UNIT	SPECIFIC OBJECTIVES	CONTENT	TEACHING AND LEARNING ACTIVITIES	EVALUATION
UNIT 1 **ESTABLISHING ENTERPRISES IN ANIMAL HUSBANDRY**	The student will be able to: 3.1.1 give examples of enterprises in animal husbandry	Enterprises in animal husbandry - Animal Production Enterprises: meat, milk, table egg, hatching egg, wool, breeding stock (e.g. hatchery) - Animal Processing Enterprises: Milk (e.g. cheese, yoghurt, 'wagashi', powder) Meat (e.g. flesh, sausages, minced) Tannery (e.g. leather wares)	Students to: -brainstorm to bring out examples of enterprises in animal husbandry	Discuss the importance of business plans
	3.1.2 identify and describe the factors that should be considered when establishing enterprises in animal husbandry.	Factors to consider in establishing an enterprise: E.g. capital, land, labour, technical know-how, market demand,	-discuss factors to consider in establishing a named enterprise in animal husbandry	
	3.1.3 prepare a simple business plan	Procedures for establishing enterprise - development of a business plan - registration of business	- describe the procedure for establishing an enterprise - discuss the importance of a business plan - discuss the format and contents of a business plan - present business plan for class discussion NOTE: Teacher to invite a resource person to give a talk on business plan.	Describe four procedures for establishing an enterprise Outline the content of a simple business plan for a named animal production/processing enterprise

ANIMAL HUSBANDRY FACILITIES, EQUIPMENT AND TEACHING/LEARNING MATERIALS				
TYPE OF ANIMAL	**HOUSING FACILITY**	**EQUIPMENT**	**TOOLS**	**OTHERS**
PIGS	Breeding stock	Feeders	Spade	Feed
	Grower	Waterers/drinkers	Knives	Water
	Farrowing pen	Heaters	Syringe and needle	Antibiotic
	Weaner	Lighting	Drenching gun	Acaricide
	Finisher	Weighing scales		Dewormer
	Store	Cages/battery		Iron dextran
	Feed room	Feed mixer		Disinfectants
	Wallow	Bucket		Vitamins
		Guard rail		Bedding material
		Clippers/plier		Glucose
		Water Tank		Clothing
		Power Washer		Wheelbarrow
		Water Hose		Audio-visuals
		Refrigerator		
		Deep freezer		
TYPE OF ANIMAL				
POULTRY	Brooder	Feeders	Spade	Feed
	Grower	Waterers/drinkers	Knives	Water
	Layer	Heaters	Debeaker	Antibiotic
	Feed room	Lighting	Wing /leg band	Coccidiostat
	Egg room	Weighing scales		Dewormer
	Store	Cages/battery		Vaccines
		Incubators		Disinfectants
		Hatchers		Vitamins
		Candling		Bedding material
		Feed mixer		Glucose
		Water tank		Clothing
		Bucket		Wheelbarrow
		Nest		Audio-visuals
		Perches		
		Egg crate		

ANIMAL HUSBANDRY FACILITIES, EQUIPMENT AND TEACHING/LEARNING MATERIALS				
TYPE OF ANIMAL	**HOUSING FACILITY**	**EQUIPMENT**	**TOOLS**	**OTHERS**
RUMINANTS	Breeding stock	Feeders	Spade	Feed
	Grower	Waterers/drinkers	Knives	Water
	Parturition	Nose ring	Syringe and needle	Antibiotic
	Weaner	Lighting	Drenching gun	Acaricide
	Finisher/kraal	Weighing scales	Saw	Dewormer
	store	Water tank	Burdizzo	Salt lick
	Feed room	Feed mixer	Hammer/Stunning gun	Disinfectants
	Dip	Bucket	Scrubbing brushes	Vitamins
		Water hose	Ear tags	Bedding material
		Hoof trimmer	Branding tool	Glucose
		Power washer	Ear notcher	Clothing
			Elastrator	Wheelbarrow
				Pastures
				Tethering ropes
				Audio-visuals