education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

SUBJECT GUIDELINES

ANIMAL PRODUCTION

NQF Level 3

September 2007

ANIMAL PRODUCTION – LEVEL 3

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INTRODUCTION

A. What is Animal Production?

The National Certificates (Vocational) extends from NQF Levels 2 to 4 in Further Education and Training Colleges. Animal Production is a Vocational subject of in the Primary Agriculture programme. The subject covers the following fields of study:

- Basic Understanding of animal anatomy and physiology
- Poultry production
- Goat production
- Sheep production
- Pig production
- Advanced animal nutrition
- Cattle farming and ostrich Farming.

The subject aims to equip students with skills, values and knowledge necessary to progress through the levels of Animal Production. Whilst the subject is grounded in the South African context, it also incorporates global small-scale farming imperatives.

B. Why is Animal Production important in the Primary Agriculture programme?

The Primary Agriculture programme is designed to equip students with the necessary skills to enter a mixed farming situation. Livestock is a central concern of farming operations.

C. The link between the Animal Production Learning Outcomes and the Critical and Developmental Outcomes

The methods of teaching and assessment are vital for the achievement of the Critical Outcomes and Developmental Outcomes. During the three years of the National Certificates (Vocational) programme, students are responsible, individually and in groups, for live animals and crops, and consequently, keep journals in which they answer, amongst others, reflective questions.

The assessment questions will require students to go beyond mere recall and into solving problems that relate to animals and the other topics linked to their practical work by asking “What if...?” and similar questions. Questions relating to the planning of farm activities can be used to promote in-depth thinking.

Given these teaching and assessment processes, by the end of the three years the students should have covered all seven Critical Outcomes to some extent and most if not all of the Developmental Outcomes. Critical thinking, critical evaluation and seeing the world as a set of interrelated systems will be easier to address by the third year of the programme, when the students are at NQF level 4; and they have more information available and are able to consider a wider range of options.

D. Factors that contribute to achieving the Animal Production Learning Outcomes

- Enabling environment – This subject should be presented in the context of small, micro and medium enterprises (SMMEs), emerging small-scale farmers and personal needs.
- Resources – Students should have access to all the necessary resources.
- Experiential exposure – Students should be exposed to real work and simulated work environments.
- Suitably qualified lecturers – Lecturers should have a solid command of subject knowledge and skills and be well informed about legislation, community issues and accessing support systems, for example systems provided by the Department of Agriculture.

1 DURATION AND TUITION TIME

This is a one year instructional programme comprising 200 teaching and learning hours. This is a full-time subject, however, it may be offered on a part-time basis provided all of the assessment requirements set out hereunder are adhered to.

Students with special education needs (LSEN) must be catered for in a way that eliminates barriers to learning.

2 SUBJECT LEVEL FOCUS

- Demonstrate an understanding of some further aspects of animal anatomy and physiology
- Demonstrate an understanding of sheep production
- Demonstrate an understanding of pig production

3 ASSESSMENT REQUIREMENTS

3.1 Internal assessment (50 percent)

3.1.1 Theoretical Component

The student will be required to achieve all outcomes of the subject at this level. All topics in this subject will contribute to formative assessment of the subject.

For Topic 1 (Animal anatomy and physiology 2), the theoretical component makes up 60 percent of the internal assessment. For Topics 2 and 3 (Sheep production and Pig production), the theoretical component makes up 40 percent of the internal assessment.

3.1.2 Practical Component

For Topic 1 (Animal anatomy and physiology 2), the practical component makes up 40 percent of the internal assessment. For Topics 2 and 3 (Sheep production and Pig production), the practical component makes up 60 percent of the internal assessment.

It must be clearly indicated which outcomes were achieved for each practical assessment, including the rating achieved for each one. All practical components must be recorded in the Portfolio of Evidence (PoE).

Practical experiential training, similar to workplace practice, is extremely important for the sheep and pig production but there may also be activities comparable to scientific laboratory work.

3.1.3 Processing of internal assessment mark for the year

The total internal assessment mark for Topic 1 (Animal anatomy and physiology 2), with the theory and practical weightings as described, is converted to a mark out of 30. The internal marks for topics 2 and 3 (Sheep production and Pig production), with the theory and practical weighting as described, are each converted to a mark out of 35.

A year mark out of 100 is calculated by adding together the internal assessment marks of the three topics.

- **Definition of the term "Structured Environment"**

Structured environment for the purposes of assessment refers to an actual or simulated workplace, or fieldwork. In the case of Animal Production, the student must be exposed to workplace and fieldwork.

With reference to the research conducted, the student must consider the specific community within which he / she lives.

Evidence of the practical component must be provided in the form of a Log Book with a clear listing of the competencies to be assessed. The following information must be contained in the log book:

- Dates and times of visits
- Reference people or organizations visited.
- Outcomes of the visit.
- Feedback from the student regarding the visit.

- Feedback from assessor.
- Field assessments (objective, when and how was it done)
- Projects completed
- Name of the student
- Environment or place where practical component was achieved
- List of outcomes to be achieved in the environment (tasks, tests)
- Time spent on the activity
- Comment on the outcomes (student's reflective comment)
- Student signature, facilitator's or supervisor's signature

For the Logbook to be regarded as valid evidence it must be signed off by an officially assigned supervisor.

- **Evidence in practical assessments**

All evidence pertaining to evaluation of practical work must be reflected in the students' Portfolio of Evidence. The tools and instruments constructed and used for the purpose of conducting such assessments must be clear from evidence contained in the PoE.

3.1.3 Processing of internal assessment mark for the year

A year mark out of 100 is calculated by adding the marks of the theoretical component and the practical component of the internal continuous assessment.

3.1.4 Moderation of internal assessment mark

Internal assessment is subject to both internal and external moderation procedures as contained in the *National Examinations Policy for FET College Programmes*.

3.2 External assessment (50 percent)

A national examination is conducted annually in October or November by means of a paper/s set externally and marked and moderated externally.

4 WEIGHTED VALUES OF TOPICS

TOPICS	WEIGHTED VALUE
1. Animal anatomy and physiology 2	30%
2. Sheep production	35%
3. Pig production	35%
TOTAL	**100**

5 CALCULATION OF FINAL MARK

Continuous assessment:	Student's mark/100 x 50/1 = a mark out of 50	(a)
Examination mark:	Student's mark/100 x 50/1 = a mark out of 50	(b)
Final mark:	**(a) + (b) = a mark out of 100**	

All marks are systematically processed and accurately recorded to be available as hard copy evidence for, amongst others, purposes of moderation and verification.

6 PASS REQUIREMENTS

The student must obtain at least fifty (50) percent in ICASS and fifty (50) percent in the examination.

7 SUBJECT AND LEARNING OUTCOMES

On completion of Animal Production Level 3 the student should have covered the following topics:
Topic 1: Animal anatomy and physiology 2
Topic 2: Sheep production
Topic 3: Pig production

7.1 Topic 1: Animal anatomy and physiology 2

7.1.1 Subject Outcome1: Explain the structure and functioning of the following systems in farm animals: external systems and coverings, sensory systems, nervous system, urinary and genital systems, endocrine gland system, homeostatic control mechanisms.

Learning Outcome 1

The student should be able to:

- Outline cellular respiration in simple terms.

Range: Both aerobic and anaerobic respiration, using overall equations. No biochemical details.

Learning Outcome 2

The student should be able to:

- Identify the main organs involved in each system, in diagrams, photographs and carcasses.
- Explain how they work, in simple terms, including (where appropriate) how they could react in situations of stress.

Range:

- ***External systems and coverings*** *include the following: mammalian / avian skin, hairs including wool and fur, feathers; commercial use of fur, feathers and hides.*
- ***Sensory systems*** *will include eyes, ears, and sensors in the skin for heat, pain and pressure.*
- ***Nervous system*** *will include major parts of the brain, spinal cord, sensory and motor nerves in general. No details on specific nerves, or on the transmission of impulses and operation of synapses.*
- ***Urinary system*** *will include simple structure and functioning of kidneys and bladder.*
- ***Genital systems*** *will include (female) ovaries, Fallopian tubes and uterus, fertilisation, implantation and parturition, (male) testes, epididymis, vas deferens.*
- ***Endocrine gland system*** *will include pituitary, thyroid, islets of Langerhans, adrenal, testes and ovaries.*
- ***Homeostatic control mechanisms*** *will include those for temperature, and the concentrations of sugar and salts in the blood.*

7.2 Topic 2: Sheep production

7.2.1 Subject Outcome 1: Identify and describe the sheep types and breeds in terms of their suitability to environmental conditions

Range: Environmental conditions include climate, vegetation and diseases. Types will include sheep producing wool as well as others.

Learning Outcomes:

- Identify the different breeds of sheep suitable for southern African conditions.
- Describe the characteristics of different types of sheep and breeds for purposes of production and breeding in different local environments.

7.2.2 Subject Outcome 2: Describe and apply feeding methods and ingredients or rations of sheep in relation to their stages of growth and production.

Learning Outcomes:

The student should be able to do the following.

- Identify and explain the different methods of feeding of sheep in relation to breed, production and growth stages.
  Range: Method refers to natural grazing/browsing, supplementary feeding
- Explain the different nutritional requirements and rearing practices in relation to the different types of sheep.
- Explain, using examples, different grazing systems in relation to adaptability and breed selection.
- Apply the above in the workplace situation.

7.2.3 Subject Outcome 3: Identify and describe grazing systems in a workplace environment.

Learning Outcomes:

The student should be able to:

- Identify and esplain the grazing habits of sheep to enable the provision of suitable grazing
- Explain carrying capacities of camps so as to determine storage capacity.
- Explain advantages and disadvantages of different grazing systems.
- Explain advantages of rotational grazing.
- Explain disadvantages of overgrazing and describe its consequences using examples.
- Explain the principles and importance of camp demarcation in relation to effective livestock farming.
- Identify appropriate material for camp demarcation for effective farming practices.
  RANGE: Material refers to materials for fencing and drinking troughs.

7.2.4 Subject Outcome 4: Select and classify grazing camps for use.

Learning outcomes:

The student should be able to:

- Select the appropriate grazing camp in terms of the availability of nutrition, water and foliage for shade,
- Demarcate camps in order to apply rotational grazing.

7.2.5 Subject Outcome 5: Identify suitable areas for sheep production in terms of climatic conditions, vegetation and market availability.

Learning outcomes:

The student should be able to:

- Identify, using examples, the suitable climate for sheep production to ensure correct breed selection.
- Identify and explain the grazing habits for sheep to enable the provision of suitable grazing.
- Identify and describe markets for sheep in order to make sound economic decisions.
  Range: Market refers to wool, meat, skin.

7.2.6 Subject Outcome 6: Identify and control diseases and parasites affecting sheep according to workplace procedures.

Learning Outcomes:

The student should be able to:

- Identify diseases and parasites that affect quality sheep production which are common in the area.
  Range: Diseases refers to bacterial, protozoan and viral diseases. Parasites include external and internal parasites.
- Outline the life cycles of the disease and parasite organisms, with particular reference to measures for prevention and control.
- Identify the treatments used for different diseases and parasites so as to apply the appropriate intervention.
- Explain the workplace procedures used to minimise infection, and for treatment of infected sheep.
- Apply the above in the workplace environment

7.2.7 Subject Outcome 7: Demonstrate an ability to handle sheep under different circumstances.

Learning Outcomes:

The student should be able to:

- Explain different ways of handling sheep in different circumstances.
  Range: Different circumstances refers to growth stages, treatment, transportation, breeding, castrating, tail docking, hoof clipping and shearing
- Apply appropriate ways of handling sheep at all stages of rearing and production.
  Range: Different circumstances refers to growth stages, treatment, transportation, breeding, castrating, tail docking, hoof clipping and shearing

7.2.8 Subject Outcome 8: Explain breeding and selection in sheep.

Learning Outcomes:

The student should be able to:

- Identify the characteristics of a ram and ewe that are suitable for breeding purposes.
- Identify and explain breeding methods to improve production.

  Range: Methods refer to upgrading, cross breeding and in-line breeding. Mendelian or other genetics is NOT required.
- Identify and explain the advantages and disadvantages of the breeding methods

7.3 Topic 3: Pig production

7.3.1 Subject Outcome 1: Explain the main pig breeds, their characteristics and housing requirements in order to produce quality products.

Learning Outcomes:

The student should be able to:

- Identify the different breeds of pigs and their characteristics to enable appropriate selection for particular circumstances.

Range: circumstances include physical environment, availability of feedstuffs, and market

- Identify the correct housing for each of the breeds in terms of the growth stages and production.

7.3.2 Subject Outcome 2: Explain, with examples, the methods of feeding pigs

Learning Outcomes:

The student should be able to:

- Identify the methods of feeding pigs and explain their advantages and disadvantages
  Range: Methods refers to intensive, semi intensive and extensive.
- Identify the correct type of feed for each growth stage to enable proper nutrition.

  Range: Growth stages refer to piglets, weaners, boar and sow.
- Compare types of feed in terms of their nutritional components and value.

  Range: Feed refers to pig meal pellets, pig meal mash and swill feed. Nutritional components limited to those covered in Animal anatomy and physiology 1 in NQF level 2.
- Make correct nutritional decisions for a herd of pigs in conditions similar to those at the college.

7.3.3 Subject Outcome 3: Explain and perform selection and breeding principles in pig production, for production and reproduction purposes.

Learning Outcomes:

The student should be able to:

- Identify and explain the characteristics of sow and boar in terms of production and reproduction, and explain and apply selection criteria in order to make sound economic decisions.
- Describe and (where possible) apply breeding methods
  Range: upgrading, cross breeding and in-line breeding
- Explain the advantages and disadvantages of the breeding methods

7.3.4 Subject Outcome 4: Identify and control diseases and parasites affecting pigs according to workplace procedures

Learning Outcomes:

- Identify and describe how climatic conditions impact on the types of diseases and parasites that infect and affect pigs.
  Range: Climatic conditions refer to cold, wet, snow, frost and humidity.
- Identify and explain diseases and parasites that commonly infect and affect pigs.
  Range: Diseases refer to bacterial, protozoan and viral
- Identify and apply the treatment used for different diseases and parasites.

Range: Treatment refers to parasite injections, dosing, dipping.

- Explain and apply the workplace procedures used for treatment of afflicted and infected pigs.
  Range: Workplace procedures refer to handling principles and facilities, vaccination programme and health monitoring (veterinarian inspections).

8 RESOURCE NEEDS FOR THE TEACHING OF PRIMARY AGRICULTURE

8.1 Phased development of training and demonstration farm

The following is a summarised phased development approach that is suggested for the establishment of a training and demonstration farm mainly for the NCV programme. It is suggested that the development of the programme be done in phases. Staff appointment has not been included

- **Phase 1:**
  - Farm layout or land use planning
  - Bush clearing on cropland
- **Phase 2:**
  - Build, equip and stock the broiler unit
  - Build, equip and stock the egg layer unit
  - Install irrigation reticulation
  - Establish vegetable field crops and seedling units
  - Establish a beekeeping unit
  - Erect external security fence
- **Phase 3**
  - Establish pastures
  - Erect internal fences and allocate grazing camps
- **Phase 4**
  - Build, equip and stock dairy, beef, goat and pig units
  - Extend training courses

8.2 Resource needs training and demonstration

FARM INFRASTRUCTURE	
1. BROILER PRODUCTION AND PROCESSING UNIT	• Building costs: 5 x 57.5m^2 • Equipment (brooders, drinkers, tube feeders) • Complete broiler processing equipment
2. LAYER AND EGG PROCESSING UNIT	• Building costs: 1 x 64m^2 • Equipment (includes cages) • 500 point of lay 20 week old pullets
3. DAIRY AND MILK PROCESSING UNIT	• Buildings • Equipment for milking and milk processing • 12 heifers

4. BEEF UNIT	• Sheltered beef feedlot unit: 1 x 30m • Beef handling pens and equipment • 12 Nguni heifers • 1 Nguni bull
5. GOAT UNIT	• 20 young nanny goats • 2 quality breeding billy goats • Goat handling pens and equipment
6. PIG UNIT	• Buildings • Equipment (brooders, farrowing rails, troughs) • 8 gilts and 2 boars
7. APIARY UNIT	• Apiary equipment including honey extractor
8. ESTABLISHED PASTURES	• Land preparation, fertilisation planting 8ha
9. IRRIGATION	• 1ha vegetables, 4ha maize/beans and 8ha pastures • Rising main from the river to reservoir and gravity flow (lower lands, paddocks) or booster pump (upper lands)
10. FARM TOOLS AND AGROCHEMICALS	• Equipment (hand tools, knapsacks, mower, wheelbarrows, spades etc.) • Farm shed
11. SEEDLING NURSERY (Vegetables, trees, shrubs)	• Shadecloth, poles, standpipes, equipment
12. WATER RETICULATION	• Reticulation to paddocks, livestock units
13. VEHICLES	• 1 tonne pick up and canopy • 1 medium size tractor • 1 mini bus for transporting learners • Tractor trailer and implements
14. FENCING	• External security fence: 2 km • Internal fences: 1.6km
15. MISCELLANEOUS	• Laboratory with equipment for plant and soil science • Laboratory with equipment for animal & poultry science • Teaching aids (data projectors, screen, DVD player etc.) • Computers with internet links • Library with relevant books and magazines