



National Unit Specification: general information

UNIT Animal Care: Anatomy and Physiology of Mammals
(SCQF level 5)

CODE F6SL 11

SUMMARY

This Unit is designed to provide an introduction to the structure and function of the mammalian animal's body. In this Unit candidates will learn the organisation of major systems within the animal's body and, using specific components as examples, develop an understanding of the relationship between structure and function in each of these systems. Candidates will apply this knowledge to investigate how common disease leads to changes in function.

This Unit is suitable for candidates who wish to progress to employment or study a variety of subjects where a basic knowledge of animal biology is required.

OUTCOMES

- 1 Identify the organisation of named body systems.
- 2 Describe the structure and function of body systems.
- 3 Describe how a common disease affects the function of a body system.

RECOMMENDED ENTRY

Entry is at the discretion of the centre.

CREDIT VALUE

1.5 credits at SCQF level 5 (9 SCQF credit points at SCQF level 5*).

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Administrative Information

Superclass: RH

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CORE SKILLS

There is no automatic certification of Core Skills in this Unit.

There are opportunities for Core Skill development; these are highlighted in the Support Notes of this Unit Specification.

National Unit Specification: statement of standards

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Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit Specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

OUTCOME 1

Identify the organisation of named body systems.

Performance Criteria

- (a) Identify the body systems.
- (b) Identify the components of named body systems.
- (c) Identify the locations of components of named body systems.

OUTCOME 2

Describe the structure and function of body systems.

Performance Criteria

- (a) Describe the key function of specific components.
- (b) Describe the relationship between the structure of specific components and their key functions.

OUTCOME 3

Describe how a common disease affects the function of a body system.

Performance Criteria

- (a) Describe a common disease which affects the function of a named body system.
- (b) Describe the normal functions of the main body system affected by this disease.
- (c) Describe the alteration to these functions as a result of this disease.
- (d) Use a variety of sources during the investigation.

National Unit Specification: statement of standards (cont)

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EVIDENCE REQUIREMENTS FOR THIS UNIT

Outcomes 1 and 2

Written and/or recorded oral evidence is required which demonstrates that the candidate has achieved Outcomes 1 and 2 to the standard specified in the Outcomes and Performance Criteria. The evidence should be produced under closed-book, supervised conditions and should last no more than one hour.

This assessment should cover four of the body systems but the candidates will not be told which four are to be assessed. The assessment will utilise structured questions of a variety of formats but be primarily of the restricted response type, with Outcome 1 partly assessed by candidates annotating relevant diagrammatic representations of the animal body.

The assessment will allow candidates to generate evidence which covers:

- ◆ identification of the eight body systems
- ◆ identification of the four component parts of each of four body systems
- ◆ location of four component parts of each of four body systems
- ◆ description of the function of one component of each of the four body systems
- ◆ description of the relationship between structure and the key function of specific components from each of four body systems

If a re-assessment is required it should examine a different sample from the range of content. This will include sampling across the range of content of two different component parts and two different body systems from those sampled in the first assessment.

Outcome 3

Written and/or recorded oral evidence produced as a result of a short investigation is required for this Outcome. Candidates will be given an investigation brief which will allow them to achieve all Performance Criteria.

The candidate should select a disease from the following list:

- ◆ Diabetes Mellitus
- ◆ Hip Dysplasia
- ◆ Pyometra
- ◆ Heart valve Disease
- ◆ Portosystemic Shunt
- ◆ Any other choice of disease should be discussed with the lecturer

National Unit Specification: statement of standards (cont)

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Candidates will gather the information on their own at appropriate points throughout the Unit. The evidence gathered must include the:

- ◆ disease chosen by the candidate in discussion with the lecturer and referring to a body system from the list in 'Guidance on the content and context for this Unit'
- ◆ normal functions of the main body system affected by that disease
- ◆ changes in function of that body system as a result of that disease
- ◆ references to at least three different source materials

National Unit Specification: support notes

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This part of the Unit Specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 60 hours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

This Unit is a knowledge based Unit which relates to the whole industry and as such does not align to a specific National Occupational Standards Unit.

This Unit is a mandatory Unit within the National Certificate in Animal Care at SCQF level 5, but may also be taken as a freestanding Unit. It is primarily intended to provide candidates with an overview of the mammalian animals body with emphasis on the relationship between structure of components and the function they perform.

Each of the body systems listed below should be taught and available for assessment.

Outcomes 1 and 2

The body systems which this Unit focuses on could include; the musculo-skeletal; respiratory; cardio-vascular; lymphatic, digestive; reproductive; urinary; nervous and endocrine systems. The basic structure of an animal cell and the range of tissues, eg connective, epithelial, nerve and muscle, associated with the different systems should be covered.

Outcome 1

Body locations where component parts of each system are found to include: head, chest, abdomen, fore and hind limbs.

◆ Musculo-skeletal system

Principal components of this system to include scapula, mandible, cranium, sternum, ribs, pelvic girdle, tibia, fibula, humerus, ulna, radius and a minimum of three common muscle structures appropriate to a four legged mammal.

◆ Respiratory system

Principal components of this system to include lungs, trachea, larynx, epiglottis, bronchi, bronchioles, alveoli, diaphragm and intercostal muscles.

◆ Cardio-vascular system

National Unit Specification: support notes (cont)

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Principal components of this system to include:

Heart (*including chambers and valves*), aorta, vena cava, pulmonary artery, pulmonary vein, *carotid artery, jugular vein, radial artery and vein, femoral artery and vein*, capillaries and blood.

Lymphatic System

In basic structure and function only.

◆ Digestive system

Principal components of this system to include mouth salivary glands, oesophagus, stomach, small intestine, colon, rectum, anus, liver, pancreas, and gall bladder.

Single stomached animals, Ruminants and Hind Gut Fermentors should all be covered.

◆ Urinary system

Principal components of this system to include kidneys, renal artery and vein, ureters, bladder, and urethra.

◆ Reproductive System

Principal components of this system to include penis, prepuce, scrotum, testes, epididymis, vas deferens, prostate, ovaries, oviducts, uterus, cervix, vagina and vulva.

◆ Nervous system

Principal components of this system to include major regions of the brain, spinal cord and peripheral nerves including sciatic, radial, thoracic and cranial nerves.

◆ Endocrine system

Principal components of this system to include pituitary, hypothalamus, thyroid, parathyroid, adrenals, pancreas, ovaries and testes.

National Unit Specification: support notes (cont)

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Outcome 2

- ◆ Musculo-skeletal system:
 - Key functions: muscles and bone in movement and support.
 - Structure to function: structure of bones and role in support and movement, role of tendons and ligaments. Structural arrangement of muscles as antagonistic pairs in relationship to function.

- ◆ Respiratory system:
 - Key function: gas exchange.
 - Structure to function: structure with respect to function with emphasis on adaptations for efficient gas exchange. Role of diffusion in gas exchange. Mechanics of inspiration and expiration.

- ◆ Cardio-vascular system:
 - Key function: transport of nutrients, gases and waste.
 - Structure to function: structural aspects relevant to function include chambers of heart, valves in heart, thick walls of arteries, valves in veins, thin walls of capillaries; role of blood cells and plasma.

- ◆ Digestive system
 - Key function: digestion and absorption to obtain raw materials for energy release, growth and repair.
 - Structure to function: relationship between structure and function illustrated by peristalsis in intestine; adaptations for efficient absorption; release and function of enzymes (general not specific), stomach acid, and bile; mechanical breakdown of food. Dietary differences of single stomach, ruminant and hindgut fermentors.

- ◆ Urinary system:
 - Key function: removal of waste.
 - Structure to function: structure with respect to function exemplified by kidney and adaptations for efficient filtration and selective reabsorption.

- ◆ Reproductive System:
 - Key function: in sperm and egg production and in fertilisation (details of meiosis NOT required).
 - Structure to function: structure with respect to function exemplified by production of seminal fluid and role of cilia in oviducts.

National Unit Specification: support notes (cont)

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- ◆ Nervous system:
 - Key function: response to change, eg response to pain or temperature.
 - Structure to function: arrangement of a reflex arc to illustrate structure/function relationship, ie: receptor sensory neurone integrating centre motor neurone effector.

- ◆ Endocrine system:
 - Key function: maintenance of homeostasis.
 - Structure to function: concept of communication between gland and target tissue using hormones as chemical messengers. Feedback control mechanisms.

Outcome 3

It is recommended that candidates should be given the opportunity to select the disease they will research in Outcome 3. However it is recommended that their choice is discussed with the teacher/lecturer before research commences.

Candidates will be given an investigation brief which will allow them to achieve all Performance Criteria. Candidates will gather the information on their own at appropriate points throughout the Unit.

The evidence gathered must include:

- ◆ One disease chosen by the candidate in discussion with the lecturer with reference to one of the body systems from the suggested list in 'Guidance on the content and context for this Unit':
 - Diabetes Mellitus
 - Hip Dysplasia
 - Pyometra
 - Heart valve Disease
 - Portosystemic Shunt
 - Any other choice of disease should be discussed with the lecturer

- ◆ The normal functions of the main body system affected by that disease
- ◆ The changes in function of that body system as a result of that disease
- ◆ References to at least three different source materials

It will be appropriate for candidates to present the results of their investigation in the form of a short report.

Centres must be satisfied that the evidence submitted is the work of individual candidates.

If re-assessment of this Outcome is required this should be remediation and resubmission of the original work.

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GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

The Unit could be delivered in a variety of contexts relating to Agriculture and/or Animal Care. In each case it is strongly recommended that, where possible, systems are taught in ways relevant to the learner.

A candidate-centred resource-based approach is likely to be most suitable for this Unit. Use of visual aids such as models, posters and videos is strongly recommended along with reference to appropriate Internet sites.

Practical experimental work may be used to demonstrate and investigate key processes within the animal's body.

Suggested practical exercises could include:

- ◆ Investigating the specificity of enzymes
- ◆ Demonstrating the purpose of digestion and absorption
- ◆ Examining a mammalian (sheep) heart
- ◆ Examining mammalian (sheep) lungs
- ◆ Examining mammalian (sheep/pig) kidneys
- ◆ Demonstrating a reflex arc
- ◆ Examining a prepared slide of blood

It is suggested that candidates should begin to collate the materials for the Outcome 3 investigative report whilst relevant systems are being taught/studied in Outcomes 1 and 2.

OPPORTUNITIES FOR CORE SKILLS DEVELOPMENT

Throughout this Unit, in learning, teaching and assessment, candidates are required to give written and/or oral descriptions of component parts of the body systems. This may provide opportunities to develop aspects of the Core Skill of *Communication*.

In Outcome 3 candidates are required to carry out some investigative work on a specific disease or injury. This can be written and/or oral, text, video or internet based. All materials gathered through this investigation are required to be analysed. This activity offers opportunities to develop aspects of the Core Skill of *Problem Solving*.

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GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Outcomes 1 and 2 could be assessed by a single holistic integrated test which will provide opportunities for Outcomes 1 and 2 to be fulfilled by means of sampling across the relevant range of content. This assessment will provide an opportunity for candidates to demonstrate knowledge and understanding of all Performance Criteria within these Outcomes.

The assessment will utilise structured questions of a variety of formats but be primarily of the restricted response type. Outcome 1 may be partly assessed by candidates annotating relevant diagrammatic representations of four legged mammals.

In **Outcome 3**, it is recommended that candidates should be given the opportunity to select the disease they will research. However it is recommended that their choice is discussed with the lecturer before research commences.

Candidates will be given an investigation brief which will allow them to achieve all Performance Criteria. Suggested diseases may be Diabetes Mellitus, Hip Dysplasia, Pyometra, Heart valve Disease, Portosystemic Shunt. Candidates will gather the information on their own at appropriate points throughout the Unit.

This Outcome is designed to introduce candidates to aspects of investigative research that will be required if they progress to higher studies.

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit, particularly for Outcomes 1 and 2. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

DISABLED CANDIDATES AND/OR THOSE WITH ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements