National unit specification

General information

Unit title: Animal Care: Physiology of Mammals: An Introduction (SCQF level 4)

Unit code: HG89 44

Superclass: SP

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Source: Scottish Qualifications Authority

Version: 01

Unit purpose

The unit is an optional unit in the SCQF level 4 National Certificate in Animal Care: An Introduction, but is also available for learners wishing to study the unit on its own and it may be suitable for an introductory programme in biology.

This unit is designed to provide the learner with an underpinning knowledge and basic understanding of the main physiological processes in mammals.

In this unit learners will develop knowledge and understanding of a range of body systems in mammals. Learners will participate in a practical investigation that will help them gain practical skills related to investigating a body function.

This unit is suitable for learners who wish to progress to employment or to a SCQF level 5 Animal Care award or other awards where a basic understanding of animal physiology is required.

Outcomes

On successful completion of the unit the learner will be able to:

1 Describe the physiology of a range of body systems in mammals.
2 Carry out a practical investigation related to a body system in mammals.

Credit points and level

1 National unit credit at SCQF level 4 (6 SCQF credit points at SCQF level 4)

National unit specification: General information (cont)

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Recommended entry to the unit

While entry is at discretion of the centre, learner would benefit from having attained the following, or equivalent:

- Companion Animal: Anatomical Landmarks

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes for this unit specification.

There is no automatic certification of Core Skills or Core Skill components in this unit.

Context for delivery

If this unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Equality and inclusion

This unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website **www.sqa.org.uk/assessmentarrangements**.

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

Describe the physiology of a range of body systems in mammals.

Performance Criteria

(a) The description, in basic terms, of the physiology of body systems is correct.

Outcome 2

Carry out a practical investigation related to a body system in mammals.

Performance Criteria

(a) The planning of the practical investigation is correct.
(b) The procedures carried out for the investigation are correct and safe.
(c) The results are recorded in an appropriate format.
(d) The interpretation of results is correct with respect to the identification of factors affecting the investigation.
(e) The conclusions drawn are valid.
(f) Comply with all relevant Health and Safety requirements.

Evidence Requirements for this unit

Evidence is required to demonstrate that learners have achieved all Outcomes and Performance Criteria.

Outcome 1

Written and/or recorded oral evidence should demonstrate learner's ability to describe:

- the function of two components for two of the following body systems:
  - Musculo-skeletal System
  - Respiratory System
  - Cardio-vascular system
  - Digestive system
  - Urinary system
  - Reproductive system
  - Nervous system
  - Endocrine system
  - Integumentary system

- the relationship between structure and the key function of two specific components for two body systems.

This assessment should cover two of the body systems but the learners will not be told which two are to be assessed. If a re-assessment is required it should examine a different sample from the range of content available.

Outcome 2

The learner will be required to plan and carry out one practical investigation related to investigating a physiological process of a body system. The practical investigation may be related to a body system assessed in Outcome 1 or refer to a third body system.

The assessor should observe the learner to ensure that procedures are followed safely and that measurements are made and recorded correctly. A checklist should be devised to ensure a reliable interpretation of the learner's practical performance for Performance Criterion (b).

The learner will be required to present written and/or recorded oral evidence for the practical investigation for Performance Criteria (a), (c) (d) and (e) under open-book conditions.

Satisfactory achievement of the Outcome will be based on the learner attaining **all** the Performance Criteria.

National unit Support Notes

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Unit Support Notes are offered as guidance and are not mandatory.

While the exact time allocated to this unit is at the discretion of the centre, the notional design length is 40 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 an optional unit within the National Certificate in Animal Care: An Introduction (SCQF level 4) but is also suitable as a freestanding unit. It is primarily intended to provide learners with an overview of the key physiological processes in mammals with emphasis on the relationship between the structure of components and the function they perform.

Outcome 1

The body systems which this unit focuses on could include: the musculo-skeletal; respiratory; cardiovascular; digestive; urinary; reproductive; nervous endocrine and integumentary systems.

It is envisaged that an overview of the principal components of each system and their location will be covered before teaching their function.

- The Musculo-skeletal system:
  - Role in support and protection. Storage of minerals. Production of blood cells. Joints. Action of antagonistic muscle pairs.

- Respiratory system:
  - Provision of large surface area in the lungs, inspiration, expiration, diffusion of gases across alveolar wall.

- Cardio-vascular system:
  - Heart and arteries as pumps. Blood as the transport medium for nutrients, waste and gases. Veins as returning vessel. Role of blood cells.

- Digestive system:
  - Carbohydrates, proteins and fats and their simple breakdown products. Mechanical and chemical breakdown of food including the principle of enzyme action. Specific enzyme names are not necessary at this level. Assimilation of food — function of villi in relation to absorption and increased surface area, immediate destination of food products. Main differences between non-ruminants and hindgut fermenters.

- Urinary system:
  - Kidney functions to include filtration and selective reabsorption in the removal of salt and water.

- Reproductive system:
  - Gamete production in basic terms, fertilisation, implantation, gestation and birth.

- Nervous system:
  - The role of the central nervous system (CNS) and peripheral nervous system. The body's response to changes such as light, sound and temperature. Reflex arc.

- Endocrine system:
  - Homeostasis and body's response to changes. Communication between gland and target tissue using hormones as chemical messengers. Examples of control of internal environment such as blood sugar regulation and blood water concentration.

- Integumentary system:
  - The skin and associated systems including hair/fur, hooves and nails.

Outcome 2

A plan of the practical investigation including safety procedures and observations/ measurements to be taken may be used to generate evidence for PC (a). An equipment list may be given to the learner.

Evidence submitted in support of attainment of PC (c) must be in the format of a table or graph(s) as appropriate. Conclusions drawn should be justified by reference to supporting evidence.

An observation checklist may be used for purposes of documenting evidence.

Suggested practical investigations could include:

- Composition analysis of artificial urine (eg protein, pH)
- Sugar levels in artificial blood or urine
- Testing blood groups in artificial blood
- Preparation and microscopic observation of an artificial blood smear
- Effect of exercise on breathing rate
- Effect of exercise on pulse rate
- Enzyme experiments on digestion
- 'Model Gut' experiment with visking tubing
- Extraction of DNA from a plant/animal cell

However, this list is not prescriptive, and other practical investigations of similar complexity in the context of mammalian nutrition, control of the internal environment, circulation and gas exchange, reproduction and sensory mechanisms and processing of information in mammals may be used by the centre. Any practical investigation involving the use of live animals must fully take account of any and all ethical considerations.

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

Satisfactory achievement of the Outcome will be demonstrated by the full and correct completion of all aspects of the investigation.

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

Guidance on approaches to delivery of 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. Although it is envisaged it will mainly focus on the cat, dog and rabbits other species can be discussed depending on learners' interests and on the context in which the unit is taught.

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.

The unit can be run in conjunction with Anatomical Landmarks.

An integrated approach is essential to develop a holistic view of the functioning of the mammalian body.

Guidance on suitable practical investigation for assessment purposes is given elsewhere in this document. However, a range of practical investigations could be used to both support understanding of the underlying theory and to prepare learners to undertake the assessed practical investigation, including:

- Examining a mammalian (sheep) heart
- Examining mammalian (sheep) lungs
- Examining mammalian (sheep/pig) kidneys
- Examining a ruminant stomach
- Demonstrating a reflex arc
- Effect of rennet at different temperatures/concentrations on cheese production
- Examining prepared slides of organs and tissues
- Demonstrating how to monitor the pulse rate on live animals
- Demonstrating how to monitor the breathing rate on live animals

National unit Support Notes (cont)

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Guidance on approaches to assessment of this unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

In Outcome 1 evidence may be generated using one holistic assessment. The assessment may use structured questions of a variety of formats but be primarily of the restricted response type. The use of a cut-off score may be appropriate.

In Outcome 2 the report should be based on a practical investigation in which the learner has demonstrated an acceptable level of participation. An equipment list may be given to the learner. An observation checklist may be used for purposes of documenting evidence.

Written and/or oral recorded evidence for Outcome 2 could be assessed by production of an open-book full laboratory report, or by completion of an appropriate pro forma. The scientific report must be the individual work of the learner derived from their active participation in a practical investigation. An assessor's observation checklist should be used to record Performance Criterion (b).

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this unit. 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 social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at **www.sqa.org.uk/e-assessment**.

Opportunities for developing Core and other essential skills

There is no automatic certification of Core Skills or Core Skills components in this unit, however there may be opportunities to develop the Core Skills of *Communication, Numeracy, Information and Communication Technology (ICT)* and *Problem Solving* at SCQF level 4.

There may be also opportunities for learners to develop their employability skills by demonstrating how to handle biological samples.

History of changes to unit

Version	Description of change	Date

General information for learners

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This section will help you to decide whether this is unit is appropriate for you by explaining what the unit is about, what you should know or be able to do before you start, what you will need to do during the unit and opportunities for further learning and employment.

This unit is designed to help you develop a basic knowledge and understanding of the key body processes in mammals.

This unit has two main Outcomes. To begin with you will look at the main body functions of the body systems in pet animals. You will then carry out a practical investigation on a specific body function of a body system.

To successfully complete this unit you will have to complete one closed-book assessment on two body systems. You will also plan a practical investigation and produce a short report on your results.

There is no automatic certification of Core Skills or Core Skills components in this unit, however you will have the opportunity to develop your Core Skills of *Communication, Numeracy, Information and Communication Technology (ICT)* and *Problem Solving* at SCQF level 4.

This unit might be suitable for you if you are interested in pursuing a career in the animal care sector, but it can also help you prepare for further studies in biology.