



National Unit specification: general information

Unit title: Specialist Procedures in Animal Technology
(SCQF level 6)

Unit code: F9XK 12

Superclass: SN

Publication date: August 2010

Source: Scottish Qualifications Authority

Version: 01

Summary

This Unit has been designed to introduce candidates to some of the specialist techniques which may be encountered in an animal facility.

It is expected that candidates will have current experience of working in an animal laboratory facility.

Outcomes

- 1 Describe the routes of administration and withdrawal and the processing of biological samples.
- 2 Describe rodent development and the production of transgenic rodents.
- 3 Describe the use and maintenance of isolators and other clean air containment systems.
- 4 Describe the procedures involved in the pre and post operative care of laboratory animals.

Recommended entry

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following, or equivalent:

- ◆ Standard Grade Biology at grade 1 or 2
- ◆ Standard Grade Science at grade 1 or 2
- ◆ Husbandry and Maintenance of Laboratory Animals (Higher)
- ◆ Maintaining Health in Laboratory Animals (Higher)

General information (cont)

Unit title: Specialist Procedures in Animal Technology
(SCQF level 6)

Credit points and level

1 National Unit credit at SCQF level 6: (6 SCQF credit points at SCQF level 6*)

**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.*

Core Skills

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

National Unit specification: statement of standards

Unit title: Specialist Procedures in Animal Technology
(SCQF level 6)

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 routes of administration and withdrawal and the processing of biological samples.

Performance Criteria

- (a) Common routes and volumes for administration of substances to laboratory animals are correctly described.
- (b) The procedures and equipment required for the administration of substances are clearly and accurately described.
- (c) Methods and appropriate species specific volumes of withdrawal of samples from laboratory animals are accurately described.
- (d) The processing and handling of sample post collection is accurately described.

Outcome 2

Describe rodent development and the production of transgenic rodents.

Performance Criteria

- (a) The physical characteristics and stages of the oestrus cycle in common laboratory species is correctly described.
- (b) The stages and methods used for the production of transgenic animals is described correctly.
- (c) The various stages of development of a mammalian embryo are correctly described.

Outcome 3

Describe the use and maintenance of isolators and other clean air containment systems.

Performance Criteria

- (a) The functioning, maintenance and uses of containment and clean air systems are correctly described.
- (b) Methods and equipment used for producing clean stock are correctly described.
- (c) Techniques for the care and maintenance of laboratory animals housed in containment systems are correctly described.

National Unit specification: statement of standards (cont)

Unit title: Specialist Procedures in Animal Technology
(SCQF level 6)

Outcome 4

Describe the procedures involved in the pre and post operative care of laboratory animals.

Performance Criteria

- (a) The preparation of operating areas, equipment, personnel and animals is accurately described.
- (b) The factors involved in pre, intra and post operative care of laboratory animals are accurately described.

Evidence Requirements for this Unit

This Unit is primarily a knowledge based Unit as the majority of the methods and techniques described in it are covered by UK legislation and practical assessment of those would require the candidate to hold a Home Office licence to perform the techniques.

As a result of this restriction written and/or oral evidence is required which clearly demonstrates that the candidate has achieved the Outcomes to the standard specified in the Performance Criteria for each Outcome. The evidence produced for these Outcomes should be obtained under controlled and supervised conditions. All assessments will be closed-book and should be completed within 1 hour.

Outcome 1

- (a) The candidate should be able to accurately describe 5 common routes for the administration of substance along with the maximum allowable volumes for specific routes in specific species.
- (b) The candidate should be able to accurately describe in detail the procedure used for the administration of substances to a named species. The description should include any equipment or preparation required ie shaving, syringe and needle sizes, any drugs used, type of restraint.
- (c) The candidate should be able to accurately describe in detail the procedure used for the withdrawal of a sample from a named species. The description should include any equipment or preparation required ie shaving, syringe and needle sizes any drugs used, type of restraint.
- (d) The candidate should accurately describe the handling and processing of samples collected from laboratory animals. This description should include type of container, labelling, anticoagulants used for various analyses.

Outcome 2

- (a) The candidate should be able to accurately describe the physical and cellular changes apparent in the oestrus cycle of common laboratory animals. The description should include any external or behavioural signs along with the various types of cell found in vaginal smears taken at the various stages of oestrus.
- (b) The candidate should be able to accurately describe the various stages and procedures used in producing transgenic animals. The description should include superovulation, embryo harvesting, incubation, pseudo pregnancy and reimplantation. Equipment used

should also be included ie micro pipettes, pipette pullers, micro manipulators etc

National Unit specification: statement of standards (cont)

Unit title: Specialist Procedures in Animal Technology
(SCQF level 6)

- (c) The candidates should be able to accurately describe the embryonic, in utero and post partum development of common species. The description should include single cell to blastocyst development and include time scales, implantation and in utero development including length of parturition and development from birth to weaning including physical characteristics used to determine age.

Outcome 3

- (a) The candidate should be able to accurately describe the maintenance and use of containment and clean air systems. This description should include the use of filter top cages, individually ventilated cages, flexible film isolators, and class 2 cabinets. The need for positive and negative pressure containment should be described.
- (b) The candidate should be able to accurately describe the rederivation methods used to improve the health status of laboratory animals. The two methods to be described are caesarean and embryo transfer rederivation. The description should include equipment and chemicals/drugs used ie surgical isolators, progesterone iodine solutions, sterile instruments etc
- (c) The candidates should be able to accurately describe the routine maintenance and husbandry for animals housed in containment. The description should include why containment is required ie either negative or positive pressure also the maintenance of the barrier by using sterile materials and cage changing methods.

Outcome 4

- (a) The candidate should be able to accurately describe the preparation of operating theatres, equipment, personnel and animal surgical procedures. The description should include a description of a typical operating theatre, scrubbing and gowning procedures, preparing surgical instruments for sterilisation, autoclaving.
- (b) The candidate should be able to accurately describe the pre, intra and post operative care of laboratory animals. The description should include skin preparation of the animal (shaving anti bacterial washes), anaesthesia, and monitoring vital signs during surgery and monitoring post operative recovery.

National Unit specification: support notes

Unit title: Specialist Procedures in Animal Technology
(SCQF level 6)

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 40 hours.

Guidance on the content and context for this Unit

This Unit acts as an introduction to common specialist techniques which may be encountered by laboratory animal technicians.

On completion of the Unit the candidate will have a background knowledge of the specialist techniques used in animal facilities and administration of substances, including pharmaceutical preparations. The requirement for true isolation of animals, individually or in groups is discussed to allow the candidate to appreciate the necessity for different environments within any laboratory.

Candidates working in laboratories are often only trained in one type of species of animal. The concepts explored in this Unit should be in a generalised format to enable the candidate to gain basic information which can be adapted to other species or animal facilities in which they might be working.

The health and safety aspects of working with laboratory animals should be taken into account throughout the Unit as should the welfare and well-being of the laboratory animals. Legal requirements make it impossible for practical assessment on live animals.

Outcome 1

Candidates should be introduced to the administration of substances. The requirement to be able to select the appropriate equipment for the substance to be administered and the species concerned should be covered. Emphasis should be put on the correct handling of substances with particular reference to health and safety. Substances themselves, are not defined.

Outcome 2

The discussion on the production of transgenic rodents should be restricted to those stages that the Animal Technician is involved in. Detailed principles or genetics or embryology are not required.

Outcome 3

This Outcome aims to introduce the concept of pathogen-free animals and the ways in which they can be bred and managed. The importance of maintaining the integrity of the isolator including the general function and routine maintenance should precede discussion of the relative merits and particular functions of different isolators. Emphasis should be placed on maintenance of sterility and prevention of the introduction of pathogens by either materials or personnel. The explanation of techniques to obtain clean stock should include reference to embryo transfer and caesarian section but detailed explanations of techniques are not required. Care of the neonate and foster rearing of animals delivered by caesarian section should be included.

National Unit specification: support notes (cont)

Unit title: Specialist Procedures in Animal Technology
(SCQF level 6)

Outcome 4

Candidates are introduced to the setting up of equipment and preparation of personnel and animals for surgery, also to the care of animals before, during and after surgery.

Guidance on learning and teaching approaches for this Unit

Candidates taking this Unit should ideally be employed in a working laboratory animal facility as much of the knowledge required is best demonstrated by experienced personnel. There are many commercially available audio visual training aids for animal technicians which are normally available in most animal facilities. Similarly, there are several training handbooks available for animal technology and transgenic animal production.

Introductory classes should cover the theory as required and the necessary legislation. Practical demonstrations should be employed wherever possible and extended to give candidates the opportunity to cover as much of the range as possible. The use of simulation may be possible in some Outcomes and this would be beneficial. Useful internet sites and powerpoint presentations are also imbedded throughout the course notes.

Opportunities for developing Core Skills

Problem Solving — Planning and organising are essential skills which will be developed when carrying out procedures on animals.

Communication — Oral communication is essential for interaction with technical and research staff. Written communication is essential for mandatory record keeping and report writing. Both will be developed within the Unit.

Numeracy — Using numbers is essential for calculating volumes dose rate to weight ratios etc

IT — Using information technology is desirable and will be developed through record keeping, spread sheets, data bases etc

Working with Others — This skill will be developed as many specialist procedures require two or more people working together and having confidence in each other.

Guidance on approaches to assessment for this Unit

Outcome 1

The use of anatomical diagrams or simulators could be used to identify sites for administration of substances. This could be used to cover the entire species range. Consideration should be given to the use of matching exercises or multiple choice questions.

Outcome 2

A problem solving approach could be taken for the assessment of the principles of genetics and should cover a range of recessive and induced crosses each correctly explained twice. Identification of the stages of development could use labelling of visual material.

National Unit specification: support notes (cont)

Unit title: Specialist Procedures in Animal Technology
(SCQF level 6)

Outcome 3

An assignment (2500 words) to compare various isolators/clean air systems and describe their function and maintenance for at least one species. Multiple choice questions to address the range.

Outcome 4

Structured questions could be used to cover this Outcome

Opportunities for the use of 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 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

History of changes to Unit

Version	Description of change	Date

© Scottish Qualifications Authority 2010

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Customer Contact Centre, telephone 0845 279 1000.