



## Higher National Unit specification: general information

**Unit title:** Animal Care: Drugs and Medicine

**Unit code:** FA5E 35

**Superclass:** SN

**Publication date:** October 2010

**Source:** Scottish Qualifications Authority

**Version:** 01

### Unit purpose

This Unit will develop candidates understanding of pharmacological principles and their applications in the use of animal medicines. Candidates will become familiar with the range of medicines in common use, safe methods of administration and current associated legislation.

On completion of the Unit the candidate should be able to:

- 1 Explain the basic principles of pharmacology.
- 2 Analyse the action of commonly used animal medicines.
- 3 Explain and apply a range of techniques to administer drugs to animals.
- 4 Evaluate the current legislation associated with the use of Veterinary Medicinal Products in the UK.

### Recommended prior knowledge and skills

Access to this Unit will be at the discretion of the centre. However, candidates will ideally have achieved a credit level pass in Standard Grade Biology or equivalent and have sound knowledge of the anatomy and physiology of healthy animals.

### Credit points and level

1 Higher National Unit credit at SCQF level 8: (8 SCQF credit points at SCQF level 8\*)

*\*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.*

## **General information (cont)**

### **Core Skills**

There are opportunities to develop the written component of the Core Skill of *Communication* at SCQF level 6 and the Core Skill of *Numeracy* at SCQF level 5 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

### **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.

### **Assessment**

This Unit could be assessed by a combination of closed-book assessments, an open-book assignment or report and a practical exercise.

## Higher National Unit specification: statement of standards

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The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

### Outcome 1

Explain the basic principles of pharmacology.

#### Knowledge and/or Skills

- ◆ Pharmacokinetics:
  - Absorption of drugs
  - Distribution of drugs
  - Metabolism of drugs
  - Excretion of drugs
  
- ◆ Pharmacodynamics:
  - Receptor mediated
  - Non receptor mediated
  - Potency and efficacy
  - Therapeutic index
  - Side effects
  - Drug interactions

#### Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can explain:

- ◆ how drugs are absorbed and distributed
- ◆ factors which influence the absorption and distribution of drugs
- ◆ how drugs are metabolised and excreted
- ◆ receptor and non-receptor mediated effects of drugs

#### Assessment Guidelines

This Outcome should be assessed by a closed-book assessment.

This Outcome could be assessed by sampling; at least half of the factors for each Evidence Requirement should be assessed on each occasion.

## Higher National Unit specification: statement of standards (cont)

**Unit title:** Animal Care: Drugs and Medicine

### Outcome 2

Analyse the action of commonly used animal medicines.

#### Knowledge and/or Skills

- ◆ Modes of action
- ◆ Antibacterial and Antiviral drugs
- ◆ Parasiticides
- ◆ Anti inflammatories
- ◆ Analgesics and sedatives (to include opioid drugs)
- ◆ Vaccines
- ◆ Drugs acting on the cardiovascular system (to include Beta Blockers)
- ◆ Drugs acting on the endocrine system
- ◆ Drugs acting on the urinary system (to include diuretics)
- ◆ National Office of Animal Health (NOAH) data sheet compendium

#### Evidence Requirements

Explain the mode of action and analyse information from the datasheet of one medicine from five of the different groups in the Knowledge and/or Skills section.

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ explain the modes of action of commonly used animal medicines. Each explanation should cover how the drugs in the group act upon the patient or microorganism; examples may include (depending on the areas sampled):
  - explain bactericidal and bacteriostatic effects of antibiotics
  - explain how anti viral drugs achieve their effects
  - explain how a diuretic drug achieves its effect
  - explain the action of an opioid analgesic
  - explain the action of a beta-blocker
  - explain the action of a vaccine.
- ◆ analyse information from drug data sheets. The analysis should include contraindications and warnings, drug interactions, storage and handling conditions.

#### Assessment Guidelines

This Outcome could be assessed by an open-book assessment with unseen questions and access to the relevant NOAH datasheets or a NOAH Datasheet Compendium.

This Outcome could be assessed by sampling.

## Higher National Unit specification: statement of standards (cont)

**Unit title:** Animal Care: Drugs and Medicine

### Outcome 3

Explain and apply a range of techniques to administer drugs to animals.

#### Knowledge and/or Skills

- ◆ Routes of administration
- ◆ Drug formulations
- ◆ Drug dosages
- ◆ Drug administration

#### Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ explain routes of administration and formulations of drugs
- ◆ explain the factors which influence the choice of route of administration of any drug
- ◆ calculate drug dosages
- ◆ administer one drug by the oral route and one drug by the topical route to at least two different animal species, in a manner which is safe to the administrator and the animal (ie candidates administer drugs on four occasions in total).

The practical component of this assessment must be conducted under supervised conditions.

#### Assessment Guidelines

This could take the form of a closed-book assessment and a practical exercise. The closed-book assessment could comprise short answer questions covering knowledge and understanding and the practical exercise covering administration drugs as detailed above. An appropriate observation checklist could be used to record candidate competence.

## Higher National Unit specification: statement of standards (cont)

**Unit title:** Animal Care: Drugs and Medicine

### Outcome 4

Evaluate the impact of current legislation associated with the use of Veterinary Medicinal Products in the UK.

#### Knowledge and/or Skills

- ◆ Veterinary Medicinal Products (VMPs)
- ◆ Current legislation

#### Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ evaluate the impact of current legislative provision and procedures associated with the use of VMPs in the workplace.

#### Assessment Guidelines

The assessment could be an open-book investigation which requires candidates to research current legislative provision in relation to VMPs and to provide a report which evaluates the impact of current legislation associated with the use of VMPs in the UK.

## Higher National Unit specification: support notes

### Unit title: Animal Care: Drugs and Medicine

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 is intended for candidates who are working in or are seeking a career in the animal care industry or for candidates who wish to develop an understanding of basic pharmacological principles and their applications in the use of animal medicines.

Additional information relating to each Outcome is given below.

#### Outcome 1

This Outcome covers the basic principles of pharmacokinetics and pharmacodynamics. Candidates should develop an understanding of the factors which influence absorption of drugs. These should include: formulation of the drug; route of administration of the drug; health status of the patient; tissue perfusion at the site of administration. Bioavailability and the first pass effect could also be explained. Factors affecting distribution of drugs should be taught: protein binding; natural barriers, eg the blood-brain barrier; tissue perfusion. For the metabolism of drugs and the organs responsible for this, metabolism must be explained, this should include the effects of drug interaction, species variations and metabolic systems, eg cytochrome p450 in the liver. Factors which affect the excretion of drugs should be discussed: route of excretion; renal and hepatic elimination; elimination half-life; therapeutic range; therapeutic index.

Candidates should develop an understanding of receptor mediated pharmacodynamics: agonist and antagonist effects; competitiveness and affinity; downregulation and upregulation; specificity; potency; efficacy. Drug interactions and adverse reaction should also be explained.

#### Outcome 2

This Outcome covers the action of commonly used animal medicines. Candidates could be taught how the drugs in each group listed act upon the patient or microorganism, eg how antibiotics disrupt cell function, how antiviral drugs work, the effect of a diuretic or a beta blocker and how the drugs achieve these effects.

The actions and therapeutic indications of drugs which have similar effects should be discussed, eg narcotic analgesics and NSAID analgesics.

Candidates must understand how to use the National Office of Animal Health data sheets correctly: eg how to locate specific drugs or types of drug; how to find information within specific data sheets.

## Higher National Unit specification: support notes (cont)

**Unit title:** Animal Care: Drugs and Medicine

### Outcome 3

This Outcome covers the administration of drugs to animals. Teaching should include an explanation of the different routes of administration of drugs: topical; oral; subcutaneous; intramuscular; intravenous and examples of other less commonly used routes, eg intra-articular; intraosseous. The different formulations of drugs should also be covered comprehensively, eg suspensions, gels, tablets, capsules etc. The factors which may influence the choice of route of administration of a drug should also be covered: species and temperament of patient; nature of the disease or injury; formulation of drug available; owner competence and compliance.

Candidates should be taught how to calculate drug dosages in terms of weight and volume: oral administration; parenteral administration and should be taught how to administer topical and oral preparations.

### Outcome 4

This Outcome covers the legislation associated with the use of VMPs in the workplace and candidates should understand the general provisions of current, relevant legislation and the necessity for such legislation. At the time of writing the key legislation includes:

- ◆ The Management of Health and Safety at Work Regulations 1999
- ◆ RIDDOR 1995
- ◆ COSHH Regulations 2002

Other legislation at the time of writing which should be covered includes:

- ◆ marketing authorisation of Veterinary Medicinal Products (VMPs)
- ◆ distribution categories of VMPs
- ◆ prescribing and dispensing policies and procedures for VMPs
- ◆ the prescribing cascade
- ◆ storage and handling of VMPs
- ◆ safe disposal of VMPs.

## Guidance on the delivery and assessment of this Unit

This Unit is likely to be part of a Group Award designed to provide candidates with the ability to work in the animal care industry. It could also be a standalone Unit for those wishing to improve their knowledge and understanding of the therapeutic use of drugs and medicines in animals. This is principally a theory based Unit, but there is a practical element and access to suitable animals and appropriate medicines will be necessary. Candidates would benefit from visits to workplaces where animal medicines are stored, dispensed or used, eg veterinary pharmacies or agricultural merchants. Visiting speakers from the pharmaceutical industry would also enhance the learning experience in this Unit.

The assessments include closed-book, open-book and practical assessments. For the practical assessments, appropriate checklists should be maintained that record competence and confirm safe practice.

## Higher National Unit specification: support notes (cont)

**Unit title:** Animal Care: Drugs and Medicine

### Outcome 1

For absorption and distribution, the explanation should include the systemic circulation through the various body fluid compartments.

For absorption and distribution, the explanation should include for absorption: formulation of drug; route of administration; health status of patient and tissue perfusion at the site of administration and for distribution: protein binding, natural barriers and tissue perfusion.

For metabolism and excretion, the explanation should include the metabolism of drugs and the organs responsible for this metabolism including the effects of drug interaction, species variations and metabolic systems. For excretion, the explanation must include route of excretion, renal and hepatic elimination; elimination half-life; therapeutic index.

For receptor and non-receptor mediated explanation should include: agonist and antagonist effects; competitiveness and affinity; down-regulation and up-regulation; specificity; potency; efficacy.

### Outcome 2

Evidence for the Knowledge and/or Skills in this Outcome will be provided via sampling. Candidates will be required to explain the modes of action of five animal medicines (one medicine from five different groups of those in the Knowledge and/or Skill items), and analyse the NOAH data sheet of each medicine in terms of contraindications and warnings, drug interactions, pharmaceutical precautions and storage and handling requirements. Assessment should be conducted under supervised conditions.

### Outcome 3

For routes of administration and drug formulations, the explanation should include common routes of administration including; topical; oral; subcutaneous; intramuscular; intravenous; intra-articular; intraosseous. Formulations must include as a minimum, suspension, gel, tablets and capsules.

For factors influencing the route of administration, the explanation could include species, temperament, nature of disease or injury, formulation of drug available, owner competence and compliance.

For the calculation of drug dosages, calculations should include weight and volume; oral administration and parenteral administration.

### Outcome 4

The evaluation should cover management of VMPs including the distribution categories of VMPs, prescribing and dispensing, the prescribing cascade, storage and handling and safe disposal and the application of the legislation in veterinary practice pharmacies; agricultural merchants' pharmacies; and livestock farms.

## Higher National Unit specification: support notes (cont)

**Unit title:** Animal Care: Drugs and Medicine

### Opportunities for developing Core Skills

There are opportunities to develop the written component of the Core Skill of *Communication* at SCQF level 6. This may be developed in the reports for Outcome 4 where candidates may have to research the current legislative provision and prepare a report that evaluates the use of the legislation in the workplace.

This Unit also provides the opportunity to develop the Core Skill of *Numeracy* at SCQF level 5. The calculation of drug dosages in terms of weights and volumes within Outcome 3 should develop the Using Number component of the Core Skill.

### Open learning

This Unit could be delivered by open learning, excluding the practical elements of Outcome 3. Candidates would be required to attend for the teaching and assessment of these practical elements.

### 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](http://www.sqa.org.uk/assessmentarrangements)

## History of changes to Unit

Version	Description of change	Date

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## General information for candidates

### Unit title: Animal Care: Drugs and Medicine

This Unit will provide you with an understanding of basic pharmacology and its application in the use of animal medicines. You will also become familiar with the range of types and formulations of animal medicines, safe methods of administration of medicines and current associated UK legislation.

This Unit is included in the framework of the HNC/HND in Animal Care but will also be of benefit to anyone wishing to improve their knowledge and understanding of the therapeutic use of drugs and medicines in animals.

The Unit content is organised into four Outcomes, covering the following areas:

- 1 The basic principles of pharmacology.
- 2 The action of commonly used animal medicines.
- 3 Formulations of drugs, routes of administration and a range of administration techniques.
- 4 Relevant, current legislation associated with animal medicines.

This is principally a theory based Unit, but there is also practical element which will involve you working directly with animals and medicines. You may benefit from visits to workplaces where animal medicines are stored, dispensed or used, eg veterinary pharmacies or agricultural merchants and these may be carried out at the discretion of your centre.

The evidence for this Unit is collected by a combination of open-book and closed-book assignments, supervised assessment and performance observation.

There may be opportunities within the Unit for you to develop the Core Skills component of Written Communication at SCQF level 6 and the component Using Numbers of the Core Skill *Numeracy* at SCQF level 5.