Higher National Unit specification

General information

Unit title: Animal Care: Drugs and Medicine (SCQF level 8)

Unit code: HC48 35

Superclass: SN

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Source: Scottish Qualifications Authority

Version: 01

Unit purpose

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

Outcomes

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

1 Explain the basic principles of pharmacology in terms of treatment of the patient.
2 Explain the action and safety guidelines 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.

Credit points and level

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

Recommended entry to the Unit

Access to this Unit will be at the discretion of the centre. However, learners 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.

Higher National Unit Specification: General information (cont)

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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**.

Higher 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.

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. Learners 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 in terms of treatment of the patient.

Knowledge and/or Skills

- Movement of drugs:
  - Factors relating to Absorption
  - Factors relating to Distribution
  - Factors relating to Metabolism
  - Factors relating to Elimination

- Interactions of drugs with the body:
  - Agonism and Antagonism
  - Specificity in relation to undesirable effects
  - Down-regulation and up-regulation and how these affect drug dosages
  - Drug Interactions and the implications of multiple concurrent treatments
  - Adverse Drug Reactions

Outcome 2

Explain the action and safety guidelines of commonly used animal medicines.

Knowledge and/or Skills

- Modes of action of:
  - Antibacterial and Antiviral drugs
  - Parasiticides
  - Anti inflammatories (NSAIDs)
  - Analgesics, Sedatives and Opioid Drugs
  - Vaccines
  - Drugs acting on the cardiovascular system (to include Beta Blockers and ACE Inhibitors)
  - Drugs acting on the endocrine system
  - Drugs acting on the urinary system (to include diuretics)

- Extracting safety information from the National Office of Animal Health (NOAH) data sheet compendium or Product Data Sheets with regard to:
  - Drug Interactions
  - Storage and Handling
  - Contraindications

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

Outcome 4

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

Knowledge and/or Skills

- Remit of the Veterinary Medicines Regulations 2009 (or other current legislation)
- Distribution Categories for veterinary medicines in terms of impact within a veterinary practice/pharmacy/other retailer: who can prescribe/who can dispense
- Further implications for medicines classified as Controlled Drugs (Schedules 1–5).
- Impact of the prescribing cascade when prescribing Veterinary Medicinal Products (VMPs)
- Processes relevant to prescribing, dispensing and labelling of VMPs and the necessity/benefits of having such procedures in place
- Pharmacy management including: environment, shelving, position, stock rotation
- Safety measures when handling VMPs and evaluate any recommendations for workers
- Importance of safe disposal of pharmaceuticals — Cytotoxic vs Non-cytotoxic

Higher National Unit specification: Statement of standards (cont)

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Evidence Requirements for this Unit

Learners will need to provide evidence to demonstrate their Knowledge and/or Skills across all Outcomes by showing that they can:

For Outcome 1, explain:

- a minimum of two of the following terms: Absorption, Distribution, Metabolism and Elimination and describe factors which affect each process.
- the concept of agonism and antagonism.
- the concept of specificity and its significance in terms of side-effects for the patient.
- the impact of down regulation and/or up regulation on the activity of drugs.
- two different forms of drug interaction.
- two different forms of adverse reaction.

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

For Outcome 2:

- explain the modes of action of one commonly used animal medicine from five of the following groups:
  - Antibacterial and Antiviral drugs
  - Parasiticides
  - Anti-inflammatories
  - Analgesics, Sedatives and Opioid Drugs
  - Vaccines
  - Drugs acting on the cardiovascular system
  - Drugs acting on the endocrine system
  - Drugs acting on the urinary system.

- retrieve information from drug data sheets for each of the 5 medicines, to include:
  - Contraindications and warnings
  - Drug interactions
  - Storage and handling conditions.

The learner should have access to the relevant National Office of Animal Health (NOAH) datasheets or NOAH Datasheet Compendium.

For Outcome 3:

- 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.

Performance evidence is required of the learner's ability to:

- 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.

Higher National Unit specification: Statement of standards (cont)

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

For Outcome 4:

- describe the remit of the Veterinary Medicines Regulations 2009 (or other current legislation).
- describe the Distribution Categories for veterinary medicines in terms of impact within a veterinary practice/pharmacy/other retailer: who can prescribe/who can dispense (Discussion should explain the role of an SQP).
- describe any further implications for medicines classified as Controlled Drugs (Schedules 1–5).
- describe and evaluate the impact of the prescribing cascade when prescribing VMPs.
- describe processes relevant to prescribing, dispensing and labelling of VMPs with evaluation on the necessity/benefits of having such procedures in place.
- describe and evaluate areas for consideration in pharmacy management — environment, shelving, position, stock rotation.
- describe appropriate safety measures when handling VMPs and evaluate any recommendations for workers.
- describe and evaluate the importance of safe disposal of pharmaceuticals — Cytotoxic vs Non-cytotoxic.

Higher National Unit Support Notes

Unit title: Animal Care: Drugs and Medicine (SCQF level 8)

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 intended for learners who are working in or are seeking a career in the animal care industry or for learners 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. Learners should develop an understanding of the factors which influence absorption of drugs in the context of how they might affect treatment of the patient.

Absorption:

- Effects of route of administration by common methods, eg Oral, SC, IM, IV
- Bioavailability
- Factors affecting absorption — blood supply, formulation (particle size and lipid/water solubility), First Pass Metabolism and its effect on oral absorption

Distribution:

- Protein binding and its effect on movement of drug through the fluid compartments
- Factors affecting distribution: Diseases which affect protein levels, Competition between drugs, Natural Barriers, Tissue Perfusion

Metabolism:

- Sites (liver mainly)
- Phase I/II reactions and the purpose of each
- Factors affecting metabolism: Induction of enzymes, Drug Interactions, Species Variation

Elimination:

- Hepatic vs Renal
- Elimination half-life and its significance in terms of repeat dosing, withdrawal periods, five half-life rule
- Therapeutic range — wide vs narrow
- Factors affecting elimination: Renal — GFR (hypotension, hypovolaemia, patient age); hepatic — Liver Disease, Entero-hepatic circulation

Receptor Mediated effects:

- Agonism vs Antagonism — interaction between drug and receptors
- Specificity — implications in terms of side effects for the patient
- Down-regulation and Up-regulation — implications in terms of long term drug use
- Drug interactions – implication of using polypharmacy — (summation, synergism, potentiation, antagonism)
- Adverse reactions

Outcome 2

This Outcome covers the action of commonly used animal medicines. Learners 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.

Learners 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.

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.

Learners 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.

Higher National Unit Support Notes (cont)

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Outcome 4

This Outcome covers the legislation associated with the use of VMPs in the workplace and learners 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 Veterinary Medicines Regulations (most current version)
  With appropriate reference to:

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

- Important elements at the time of writing which should be covered include:
  — 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 approaches to delivery of this Unit

This Unit is likely to be part of a Group Award designed to provide learners 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. Learners 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.

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.

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.

Outcome 1

This Outcome could be assessed by sampling; for example from the terms Absorption, Distribution, Metabolism and Elimination two of the four areas could be assessed along with factors which affect the stated process.

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 should include route of excretion, renal and hepatic elimination; elimination half-life.

For receptor and non-receptor mediated explanation should include: agonist and antagonist effects; down-regulation and up-regulation; specificity; drug interactions; adverse reactions.

Outcome 2

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.

Evidence for the Knowledge and/or Skills in this Outcome could be provided via sampling. Learners 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

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 learner competence.

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.

Higher National Unit Support Notes (cont)

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Outcome 4

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

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.

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, however there may be 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 learners may have to research the current legislative provision and prepare a report that evaluates the use of the legislation in the workplace.

This Unit may also provide 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 could develop the Using Number component of the Core Skill.

History of changes to Unit

Version	Description of change	Date

General information for learners

Unit title: Animal Care: Drugs and Medicine (SCQF level 8)

This section will help you decide whether this is the Unit 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 intended to develop your knowledge of pharmacological principles and their application in the use of animal medicines. You will become familiar with the range of medicines in common use, safe methods of administration and current associated legislation.

On completion of this Unit you will be able to:

- explain the basic principles of pharmacology in terms of treatment of the patient.
- explain the action and safety guidelines of commonly used animal medicines.
- explain and apply a range of techniques to administer drugs to animals.
- evaluate the current legislation associated with the use of Veterinary Medicinal Products in the UK.

You will be assessed by a mixture of open and closed-book theoretical assessments and a practical assessment.