

Next Generation Higher National Unit Specification

Principles of Livestock Production (SCQF level 7)

Unit code: J8G6 47
SCQF level: 7 (32 SCQF credit points)
Valid from: session 2024 to 2025

Prototype unit specification for use in pilot delivery only (version 1.0) September 2024

This unit specification provides detailed information about the unit to ensure consistent and transparent assessment year on year.

This unit specification is for teachers and lecturers and contains all the mandatory information required to deliver and assess the unit.

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Unit purpose

This unit gives you an overview of livestock production in Scotland. It covers the science, husbandry and technology involved, along with the environmental considerations.

Unit outcomes

Learners who complete this unit can:

- 1 explain the principles of livestock science
- 2 describe and analyse the application of the principles of livestock science in a range of livestock production systems
- 3 describe the relationship between livestock production and the environment and develop strategies to enhance the relationship — making reference to sustainability principles (social, economic, environmental) and at least two United Nations (UN) Sustainable Development Goals (SDGs)
- 4 describe the application of precision livestock technology in a livestock production system

Evidence requirements

To successfully achieve these outcomes, learners must provide the following evidence:

Outcome 1

- ◆ Identify the structure and functions of reproductive and digestive anatomy.
- ◆ Explain the functioning of the endocrine system.
- ◆ Explain the functioning of the immune system.
- ◆ Explain the physiology of growth and reproduction.
- ◆ Identify appropriate animal feeds and their uses.

Outcomes 2 and 3

You can assess these outcomes by asking learners to produce a portfolio describing two livestock production systems, to include the following evidence:

- ◆ a description of the farm(s)
- ◆ a description of two different livestock production systems
- ◆ a description of the buildings and machinery used on farm for each livestock production system
- ◆ relevant health plans
- ◆ feeding plans for two groups of stock in each production system
- ◆ an analysis of the application of the principles of livestock science on farm
- ◆ a description of the relationship between the livestock production systems and the environment
- ◆ an explanation of how the livestock production systems meet sustainability principles and the aims of at least two of the UN SDGs
- ◆ potential strategies that could be used to enhance the relationship between livestock production and the environment

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Outcome 4

You can assess this outcome by asking learners to complete a project, to include the following evidence:

- ◆ collection of on-farm data using a precision livestock technology
- ◆ interpretation of data
- ◆ suggestions for how this data could be utilised

Knowledge and skills

The following table shows the knowledge and skills covered by the unit outcomes:

Knowledge	Skills
<p>Outcome 1 Learners should understand:</p> <ul style="list-style-type: none"> ◆ the principles of livestock science 	<p>Outcome 1 Learners can:</p> <ul style="list-style-type: none"> ◆ describe and explain the principles of livestock science
<p>Outcome 2 Learners should understand:</p> <ul style="list-style-type: none"> ◆ how the principles of livestock science affect livestock in production systems 	<p>Outcome 2 Learners can:</p> <ul style="list-style-type: none"> ◆ apply the principles of livestock science in production systems
<p>Outcome 3 Learners should understand:</p> <ul style="list-style-type: none"> ◆ the relationship between livestock production and the environment 	<p>Outcome 3 Learners can:</p> <ul style="list-style-type: none"> ◆ describe the relationship between livestock production and the environment
<p>Outcome 4 Learners should understand:</p> <ul style="list-style-type: none"> ◆ how to apply precision livestock technology in a livestock production system 	<p>Outcome 4 Learners can:</p> <ul style="list-style-type: none"> ◆ describe how to apply precision livestock technology in a livestock production system

Meta-skills

Throughout the unit, learners develop meta-skills to enhance their employability in the agriculture sector.

We aim, where possible, to deliver the content holistically, and assess in accordance with the integrated nature of agriculture. This allows learners to develop meta-skills throughout the course of the unit.

Self-management

This meta-skill includes:

- ◆ focusing: collecting the correct information for the portfolio by filtering out non-essential material
- ◆ integrity: reflecting on the ethics of farming livestock, considering their welfare and the learners' personal views
- ◆ adapting: developing openness and adaptability by considering the environmental impacts of livestock production systems, and the impact the environment and climate change has on livestock production systems

Social intelligence

This meta-skill includes:

- ◆ communicating: building communication skills, particularly an ability to listen, receive information and give information to obtain accurate data for the portfolio
- ◆ feeling: developing empathy when considering animal welfare, and nurturing a social conscience about livestock farming and the environment

Innovation

This meta-skill includes:

- ◆ curiosity: improving information sourcing and questioning to enhance understanding
- ◆ holistic thinking: approaching the farming system in all its complexity, considering the environment and livestock
- ◆ sense-making: demonstrating and developing synthesising and logical and computational thinking skills when analysing data

Literacies

Learners develop core skills in the following literacies:

Numeracy

Learners develop numeracy skills by:

- ◆ collecting and interpreting real farm data for outcome 4
- ◆ using figures inherent in livestock production

Communication

Learners develop communication skills by:

- ◆ gathering information for all learning outcomes
- ◆ communicating findings through assessments

Digital

Learners develop digital skills and computer literacy by:

- ◆ collecting and analysing data for outcome 4, ideally utilising digital technologies
- ◆ producing assessment evidence, as well as engaging with learning materials and course content

Delivery of unit

As you deliver the unit, you should arrange visits to a range of livestock farms as well as teaching the theoretical knowledge. You should link into the Professional Practice and Skills at SCQF level 7 unit by making reference to practical livestock skills.

Additional guidance

The guidance in this section is not mandatory.

Approaches to delivery and assessment

Explain the principles of livestock science (outcome 1)

Suggested content

Describe and explain the principles of livestock science, including:

- ◆ anatomy:
 - the structure and functions for the male and female reproductive tracts, including mammalian and avian examples, the digestive anatomy of the monogastric and ruminant animal, and the udder
- ◆ endocrine system:
 - the role and function of the endocrine system for reproduction, growth, and digestion
- ◆ immune system:
 - the main pathogens, along with common disease examples, their transmission routes, and appropriate prevention and treatment strategies
- ◆ growth and reproduction:
 - the properties of muscle, adipose and skeletal tissue, and identification of the cells involved in their construction
 - gamete development, oestrus, ovulation, mating, fertilisation, implantation, placentation, foetal growth, gestation, parturition, care of the neonate and lactation
- ◆ feed and nutrition
 - identification of feeds, their properties and appropriate uses

Suggested evidence

You can assess this outcome using short, in-class, closed-book tests, or short, open-book tests, which can include multiple-choice and short-answer questions.

Describe and analyse the application of the principles of livestock science in a range of livestock production systems (outcome 2)

Suggested content

- ◆ Describe various production systems, including beef, lamb, dairy, pigs, broilers and layers.
- ◆ Explain the variety in systems: intensive, extensive, regenerative and organic systems, geographies.
- ◆ Describe the husbandry in each system including:
 - breeding: pre-mating checks, mating and artificial intelligence (AI), pregnancy, parturition and care of the neonate
 - health: signs of ill-health; diseases (including symptoms, prevention and treatment); health plans

- nutrition: feed identification (not rationing), following a ration to actually make the diet, body condition scoring (BCS), basic requirements
- welfare and behaviour: positive animal welfare, signs of suffering, five freedoms
- housing: basic housing principles
- grass and fodder management: utilisation (not production)
- ◆ Explain products and outputs including:
 - products from different systems: meat, wool, eggs and milk
 - the importance of sending clean stock to slaughter, preparing stock for slaughter, preparing stock for sale, injection sites and bruising (not carcass grading)

Describe the relationship between livestock production and the environment, and develop strategies to enhance the relationship (outcome 3)

Suggested content

- ◆ soil: erosion, sedimentation, compaction, organic matter, role as a fertiliser, rotation
- ◆ water courses: nitrogen, eutrophication, flooding
- ◆ biodiversity
- ◆ awareness of impacts of livestock on climate change: methane and efficiency
- ◆ awareness of impacts of climate change on livestock: fluke, heat stress
- ◆ potential strategies to enhance the relationship between livestock production and the environment: late cutting of grass, use of water margins, conservation grazing systems, improved efficiencies, reduced use of plastics

Outcomes 2 and 3

Suggested evidence

You can assess this outcome by means of a portfolio in which learners describe two livestock production systems, to include:

- ◆ a description of the farm(s)
- ◆ a description of two different livestock production systems
- ◆ a description of the buildings and machinery used on farm for each livestock production system
- ◆ relevant health plans
- ◆ feeding plans for two groups of stock in each production system
- ◆ an analysis of the application of the principles of livestock science on farm, including feeding, health and breeding
- ◆ an analysis of the relationship between the livestock production systems and the environment
- ◆ potential strategies to enhance the relationship between livestock production and the environment

The portfolio should be 3,000 words in total.

Describe the application of precision livestock technology in a livestock production system (outcome 4)

Suggested content

- ◆ the importance of data for livestock production
- ◆ data-collection methods using precision livestock technologies
- ◆ the application of data on farm

Suggested evidence

You can assess outcome 4 through a project where learners collect farm data, input the data into a spreadsheet, and then interpret it and make suggestions. They can present this as a poster, oral presentation, video, podcast or suitable equivalent. Alternatively, they can produce a written assessment, in the form of a 1,500-word report or suitable equivalent.

An example project would be to ask learners to collect lamb weights using electronic identification (EID), analyse weights by looking at the daily live weight gain (DLWG), then suggest a worming strategy.

You can assess this outcome alongside outcome 4 in the Principles of Crop Production unit.

Equality and inclusion

This unit is designed to be as fair and as accessible as possible with no unnecessary barriers to learning or assessment.

You should take into account the needs of individual learners when planning learning experiences, selecting assessment methods or considering alternative evidence.

Guidance on assessment arrangements for disabled learners and/or those with additional support needs is available on the assessment arrangements web page:

www.sqa.org.uk/assessmentarrangements.

Information for learners

Principles of Livestock Production (SCQF level 7)

This information explains:

- ◆ what the unit is about
- ◆ what you should know or be able to do before you start
- ◆ what you need to do during the unit
- ◆ opportunities for further learning and employment

Unit information

This unit gives you the knowledge and skills you need to:

- ◆ describe and explain the principles of livestock science
- ◆ apply the principles of livestock science in production systems
- ◆ describe the relationship between livestock production and the environment and develop strategies to enhance the relationship — making reference to sustainability principles (social, economic, environmental) and at least two United Nations (UN) Sustainable Development Goals (SDGs)
- ◆ describe the application of precision livestock technology in a livestock production system

When you study the unit, you learn the theoretical knowledge of the scientific principles that underpin livestock production, including animal health, breeding and nutrition. You can then see these principles put into context on farm, and watch how they are applied through livestock husbandry. You look at the effect livestock production systems have on the environment and what farmers can do to reduce any negative impacts. The unit shows you how precision technology can be used to assist livestock farmers.

You do not need any prior experience or understanding of livestock production systems to study the unit. The Professional Practice and Skills at SCQF level 7 unit allows you to put much of this theory into practice if you complete it at the same time.

You can be assessed in a variety of ways:

- ◆ Outcome 1: you can be assessed using short tests that include short-answer or multiple-choice questions.
- ◆ Outcomes 2 and 3: you create a portfolio of your investigations into a livestock production system on farm.
- ◆ Outcome 4: you carry out a project in which you collect and analyse real farm data, and make suggestions on your findings.

This unit gives you the knowledge to work on a livestock enterprise on a farm. The Professional Practice and Skills at SCQF level 7 unit gives you the associated practical livestock skills. Together, they give you the knowledge and skills to become a stock person

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on farm. If you complete the Higher National Diploma (HND) Agriculture, you can look to run and lead a livestock enterprise on farm.

Administrative information

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Superclass: SH

History of changes

Version	Description of change	Date
1.0	Added UN SDGs to unit outcomes and unit information sections. Removed content on mechanisation. Changed unit code.	September 2024

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