Next Generation Higher National Unit Specification

Livestock Management Systems (SCQF level 8)

Unit code: J7AK 48

SCQF level: 8 (32 SCQF credit points)

Valid from: session 2023–24

Prototype unit specification for use in pilot delivery only (version 1.0) September 2023

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.

Unit purpose

This unit introduces learners to the management of livestock enterprises in Scotland. It covers science and husbandry, processing and product quality, enterprise performance, managing livestock waste, and environmental considerations. The unit is solution-focused, which means that learners develop their ability to solve livestock problems in farm-based scenarios.

It is aimed at learners with a specific interest in livestock farming and those who want to enhance their understanding of agricultural practice.

Entry to the unit is at your centre's discretion. Before taking the unit, learners should have a good understanding of livestock production systems (beef, lamb, dairy, pork, egg and chicken) in Scotland and how they operate. They could demonstrate this by completing the unit Principles of Livestock Production at SCQF level 7, which is part of the Higher National Certificate (HNC) in Agriculture.

This is a mandatory unit in the Higher National Diploma (HND) in Agriculture, and can also be taken on a stand-alone basis.

If learners study the unit as part of HND Agriculture, they may be able to progress to related degree-level study. Alternatively, they may want to go directly into employment in an agricultural business.

Unit outcomes

Learners who complete this unit can:

1 use scientific principles to identify appropriate livestock husbandry techniques in a production system
2 determine how the quality of livestock products and/or produce can be affected by the production system
3 appraise a livestock enterprise based on performance figures
4 determine how livestock wastes and pollutants can be handled to conform to good agricultural practice and protect the environment
5 describe the contribution that farmland could make to biodiversity enhancement using regenerative agriculture techniques and habitat management

Evidence requirements

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

Outcomes 1, 2 and 3

You should give learners a farm-based livestock problem, using a real or imagined scenario, for which they must:

♦ identify an appropriate solution
♦ justify the solution
♦ identify an acceptable level of incidence and/or prevalence of the problem

Identifying husbandry techniques (outcome 1)

Example problems could involve (but are not limited to):

♦ health
♦ nutrition
♦ reproduction
♦ performance

The impact of different production systems on livestock quality (outcome 2)

Example problems could involve (but are not limited to):

♦ product quality

Appraising a livestock system (outcome 3)

Example problems could involve (but are not limited to):

♦ technical performance — key performance indicators (KPIs)
♦ financial performance (including gross margin, variable costs)

Outcome 4

Learners must prepare a farm wastes and nutrient management plan, which should include:

♦ relevant livestock, housing and field data

♦ a plan for recycling the nutrients in animal manures, giving consideration to nutrient value, crop requirements and application timings, and in accordance with current regulations and best practice

♦ a description of the manure storage and machinery requirements to achieve the farm wastes and nutrient management plan objectives

♦ a description of non-animal wastes and how they should be managed

♦ an appreciation of the impact of pollutants on water quality and aquatic ecosystems, and strategies to mitigate negative effects

Outcome 5

Learners must investigate biodiversity on an individual farm. Their investigation should include:

♦ an overview of on-farm habitats, including brief descriptions

♦ the following specific details for one habitat:

— a detailed description

— the species present, including population status

— management of habitat to maintain and/or enhance

— value of the habitat to the farm

Knowledge and skills

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

Knowledge	Skills
Outcome 1 Learners should understand: ♦ the application of scientific principles in a livestock production system	**Outcome 1** Learners can: ♦ use scientific principles to select and justify appropriate husbandry techniques to solve a livestock performance and/or production problem
Outcome 2 Learners should understand: ♦ how the production system and husbandry can affect livestock products and/or produce quality	**Outcome 2** Learners can: ♦ use scientific principles to select and justify appropriate husbandry techniques to solve a livestock products and/or produce quality problem
Outcome 3 Learners should understand: ♦ how to appraise a livestock enterprise	**Outcome 3** Learners can: ♦ use business and science principles to select and justify appropriate business and/or husbandry techniques to solve a livestock enterprise performance problem
Outcome 4 Learners should understand: ♦ how to manage farm wastes and pollutants	**Outcome 4** Learners can: ♦ create a farm wastes management plan
Outcome 5 Learners should understand: ♦ the positive and negative impacts of farmland and husbandry practices on biodiversity	**Outcome 5** Learners can: ♦ describe the contribution farmland can make to biodiversity

Meta-skills

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

Self-management

This meta-skill includes:

♦ focusing: collecting the correct information for the farm wastes management plan by filtering out non-essential material; concentrating on finding the right information to solve the production-based problems

♦ integrity: reflecting on the ethics of farming livestock; considering livestock welfare and learners' personal views along with business decisions

♦ adapting: developing openness and adaptability by problem solving production and/or performance problems

Social intelligence

This meta-skill includes:

♦ communicating: building communication skills — particularly an ability to listen — to receive and give information accurately

♦ feeling: developing empathy when considering animal welfare; nurturing a social conscience about livestock farming and the environment

Innovation

This meta-skill includes:

♦ curiosity: seeking to improve information sourcing; asking questions to enhance understanding

♦ holistic thinking: approaching the farming system in all its complexity, giving consideration to the environment, livestock and associated mechanisation

♦ sense-making: demonstrating and developing synthesising and logical thinking skills when analysing information to solve problems

Literacies

Numeracy

Learners develop numeracy skills by:

♦ interpreting livestock figures, both technical and financial

Communication

Learners develop communication skills by:

♦ gathering information for all learning outcomes
♦ communicating their findings in assessments

Digital

Learners develop digital skills and computer literacy by:

♦ producing assessment evidence, and engaging with learning materials and course content

Delivery of unit

This is a mandatory unit in HND Agriculture.

The notional design length for the unit is 160 hours. However, the amount of time you allocate to each outcome is at your discretion. We suggest the following distribution of time, including assessment:

Outcome 1 — Use scientific principles to identify appropriate livestock husbandry techniques in a production system
(40 hours)

Outcome 2 — Determine how the quality of livestock products and/or produce can be affected by the production system
(40 hours)

Outcome 3 — Appraise a livestock enterprise based on performance figures
(40 hours)

Outcome 4 — Determine how livestock wastes and pollutants can be handled to conform to good agricultural practice and protect the environment
(20 hours)

Outcome 5 — Describe the contribution that farmland could make to biodiversity enhancement using regenerative agriculture techniques and habitat management
(20 hours)

Additional guidance

The guidance in this section is not mandatory.

Approaches to delivery

As you deliver the unit, you should arrange visits to a range of livestock farms, as well as teaching the theoretical knowledge. The problems you ask learners to address could be based on real or imagined scenarios, but they should always be farm-based.

Use scientific principles to identify appropriate livestock husbandry techniques in a production system (outcome 1)

You should cover:

♦ nutrition and ration formulation
♦ health planning, including:
    — conventional and organic (preventative)
    — metabolic
    — nutrition
♦ reproductive husbandry and technology, including:
    — estimated breeding values (EBVs)
    — indices
    — breeding improvement schemes
♦ intensive versus extensive systems, giving consideration to:
    — welfare
    — ethics
    — the environment
♦ farm wastes and associated buildings and mechanisation, including:
    — slats
    — pumps
    — floor design
♦ advanced livestock buildings and mechanisation concepts, including:
    — psychrometric charts
    — thermal insulation
    — heat balance, upper and lower critical limit and/or temperatures
♦ digital platforms and data handling

Determine how the quality of livestock products and/or produce can be affected by the production system (outcome 2)

You should cover:

♦ livestock products and/or produce quality parameters
♦ factors affecting livestock products and/or produce quality
♦ processing livestock products and/or produce to make a safe product for human consumption

Appraise a livestock enterprise based on performance figures (outcome 3)

You should cover:

♦ technical and financial performance
♦ benchmarking livestock enterprises
♦ gross margins interpretation and variable costs

Determine how livestock wastes and pollutants can be handled to conform to good agricultural practice and protect the environment (outcome 4)

You should cover:

♦ livestock wastes, operational farm wastes and associated pollutants
♦ the shift of attitude away from farm wastes to how materials are applied to land in a way that benefits the agriculture and the circular economy
♦ EU good agricultural and environmental conditions (GAECs), UK Environment Agency general binding rules, and DEFRA (Department for Environment, Food & Rural Affairs) guidance on cross-compliance
♦ farm wastes and nutrient management plan, including:
  — livestock, housing and field data relevant to a farm wastes and nutrient management plan
  — a plan for the recycling of animal manure nutrients, with consideration to nutrient value, crop requirements, rotation and application timings, in accordance with current regulations and best practice
  — a description of the manure storage and machinery requirements to achieve the farm wastes and nutrient management plan objectives
♦ water quality, controlled activities regulations and nitrate vulnerable zones

Describe the contribution that farmland could make to biodiversity enhancement using regenerative agriculture techniques and habitat management (outcome 5)

You should cover:

- natural capital, including:
    — biodiversity level on farm
    — policy
    — indicator and priority species
    — habitats
    — benefits
    — biodiversity sampling
- habitat creation and management, and associated husbandry

Approaches to assessment

Outcomes 1, 2 and 3

To achieve these outcomes, learners must explore a farm-based livestock problem, based on real or imagined scenarios.

You could assess this by writing three scenarios per outcome, with each student selecting one to 'solve'. We give some options in the table below. You are not restricted to these, and there are many other options. Ideally, you should ensure learners have the opportunity to look at different production systems and choose the one they want to solve. You could present each problem in the form of a short video accompanied by supporting documents, like photos, feedback from the processor, and gross margin information.

Potential problem scenarios

Learners could consider many possible problem scenarios. Here are some examples (with the production system given in parentheses):

Outcome 1
- avian influenza identified in the UK: what measures should the farmer take? (layers)
- high number of cases of pneumonia in calves (beef)
- lowland flock scanned at 125% (sheep)

Outcome 2
- high number of 'soft shells' in layer enterprise (layers)
- high Bactoscan and SCC (somatic cell count) in milk (dairy)
- PSE (pale, soft, exudative meat) found in pork post-slaughter (pigs)

Outcome 3
♦ large losses between scanning and lambing in hill flock (sheep)
♦ gross margin shows suckler herd losing £100 per cow (beef)
♦ average number of lactations is 2.5 in 150-cow herd (dairy)

Outcome 4
Students must prepare a farm wastes and nutrient management plan. The plan should include:

♦ livestock, housing and field data relevant to a farm wastes and nutrient management plan
♦ a plan for the recycling of the nutrients in the animal manures, giving consideration to nutrient value, crop requirements and application timings, in accordance with current regulations and best practice
♦ description of the manure storage and machinery requirements to achieve the farm wastes and nutrient management plan objectives
♦ description of the non-animal wastes and how they are managed
♦ appreciation of the impact of pollutants on water quality and aquatic ecosystems and strategies to mitigate negative effects

Outcome 5
Students must investigate biodiversity on an individual farm. The investigation should include:

♦ an overview of habitats on farm, including brief descriptions
♦ the following for one habitat:
    — a detailed description
    — the species present, including population status
    — management of habitat to maintain and/or enhance
    — value of the habitat to the farm

You could assess this outcome in various ways, including short-answer questions, a poster and/or presentation, short video, or short essay.

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

Livestock Management Systems (SCQF level 8)

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 to:

♦ use scientific principles to identify appropriate livestock husbandry techniques in a production system

♦ determine how the quality of livestock products and/or produce can be affected by the production system

♦ appraise a livestock enterprise based on performance figures

♦ determine how livestock wastes and pollutants can be handled to conform to good agricultural practice and protect the environment

♦ describe the contribution that farmland could make to biodiversity enhancement using regenerative agriculture techniques and habitat management

This is a mandatory unit in the Higher National Diploma (HND) in Agriculture. You can also take it on a stand-alone basis.

Before taking the unit, you should have a good understanding of livestock production systems (beef, lamb, dairy, pork, egg and chicken) in Scotland and how they operate. You could demonstrate this by completing the unit Principles of Livestock Production at SCQF level 7, which is part of the Higher National Certificate (HNC) in Agriculture.

When you study this unit, you learn the practical application of livestock husbandry techniques, along with the science behind them. You look to identify and solve various livestock problems, whether in real or imagined scenarios, and to describe what an appropriate outcome would be. You also learn about how livestock products can be processed and marketed to produce a safe, traceable and high-quality food product. You assess livestock enterprises in terms of their technical and financial performance, and compare these figures to industry benchmarks. You consider how livestock farms can have both a positive and a negative effect on the environment, and look at what farmers can do to enhance the positive effects and mitigate the negative effects.

Throughout the unit, you develop meta-skills to enhance your employability in the agricultural sector. There are opportunities to develop meta-skills in:

- self-management
- social intelligence
- innovation

If you study the unit as part of HND Agriculture, you may be able to progress to related degree-level study. Alternatively, you may want to go directly into employment in an agricultural business.

Administrative information

15

Published: September 2023 (version 1.0)

Superclass: SH

History of changes

Version	Description of change	Date

Note: please check [SQA's website](#) to ensure you are using the most up-to-date version of this document.