



National Unit specification: general information

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| Unit title: | Milking (SCQF level 6) |
| Unit code: | H286 12 |
| Superclass: | SH |
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| Version: | 01 |

Summary

This Unit enables candidates to develop the specialist skills and knowledge required to milk livestock and produce hygienic milk on a dairy farm. This is an optional Unit within the National Certificate in Agriculture (SCQF level 6) but is also available as a free-standing Unit. Successful completion of this Unit may facilitate progression to further study of livestock, or to related employment.

Outcomes

- 1 Describe the basic structure of the udder and explain the mechanism of milk secretion and let down.
- 2 Carry out the routine of preparing, operating, cleaning and maintaining milking and ancillary equipment.
- 3 Record lactation performance indicators for a group of dairy cows.
- 4 Demonstrate an understanding of milk hygiene and compositional quality.

Recommended entry

While entry is at the discretion of the centre, knowledge of basic dairy production would be beneficial, which could be evidenced by the following Unit or equivalent:

XXXX XX *Dairy Production* at (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.*

General information (cont)

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Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the support notes of this Unit specification.

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

National Unit specification: statement of standards

Unit title: Milking (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 basic structure of the udder and explain the mechanism of milk secretion and let down.

Performance Criteria

- (a) Describe the main internal and external anatomical features of the udder.
- (b) Explain the mechanism of milk secretion.
- (c) Explain the mechanism of milk let down.

Outcome 2

Carry out the routine of preparing, operating, cleaning and maintaining milking and ancillary equipment.

Performance Criteria

- (a) Prepare milking equipment.
- (b) Prepare animals for milking.
- (c) Operate milking equipment.
- (d) Follow an effective and efficient milking routine.
- (e) Clean and disinfect milking equipment.
- (f) Maintain milking and ancillary equipment.

Outcome 3

Record lactation performance indicators for a group of dairy cows.

- (a) Record individual animal identity and daily milk yield for a group cows.
- (b) Establish lactation number and days in milk of current lactation for each of the cows in the group.
- (c) Establish and compare previous yields to current yield for each of the cows in the group.

Outcome 4

Demonstrate an understanding of milk hygiene and compositional quality.

- (a) Describe factors affecting milk composition in raw farm milk.
- (b) Describe factors affecting milk hygiene in raw farm milk.
- (c) Describe mastitis, routes of infection, treatment and prevention.
- (d) Explain the standard components of a milk buyers payment schedule for raw farm milk.

National Unit specification: statement of standards (cont)

Unit title: Milking (SCQF level 6)

Evidence Requirements for this Unit

Written and/or oral evidence is required to demonstrate that candidates have achieved all of the Outcomes and Performance Criteria. Evidence must be obtained under supervised conditions at appropriate points throughout the Unit.

Candidates must provide written and/or oral evidence which shows that they can:

- ◆ describe the udder, to include identification of a minimum of seven anatomical features, including the suspensory ligaments, alveoli, alveolar ducts, gland cistern, sphincter muscle, teat cavity, teat canal.
- ◆ explain the blood flow to and from the udder and the role of secretory cells.
- ◆ explain of the stimulus leading to milk flow, the role of oxytocin and the role of teat preparation in achieving optimal milk flow.
- ◆ state the role and purpose of vacuum and pulsation in harvesting milk by machine.

Outcome 2

Candidates must provide performance evidence, under supervised conditions which shows that they can:

- ◆ prepare dairy equipment prior to commencing milking in accordance with good farm practice.
- ◆ hygienically prepare teat prior to attachment of the milking cluster in a manner appropriate to the requirements of hygienic milk production.
- ◆ handle and operate the milking cluster in accordance with good farm practice.
- ◆ follow an effective and hygienic milking routine in accordance with good farm practice.
- ◆ clean and disinfect equipment in accordance with good farm practice.
- ◆ carry out routine basic maintenance of milking equipment in accordance with good farm practice.

Outcome 3

Candidates must provide written, graphical and/or oral evidence which shows that they can:

- ◆ record individual identity and daily milk yield for a minimum group of 10 cows in milk that have completed at least one lactation.
- ◆ establish lactation number and days in milk of current lactation of each cow in the group, accessing computer or paper records.
- ◆ establish and compare previous yields to current yield for both daily milk yield and lactation and/or annual yield for the same stage of a previous lactation, for each cow in the group.

National Unit specification: statement of standards (cont)

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Outcome 4

Candidates must provide written and/or oral evidence which shows that they can:

- ◆ description of a minimum of five factors which influence milk compositional quality.
- ◆ description of a minimum of five factors which influence milk hygiene quality on-farm.
- ◆ description of how cows contract mastitis infection, how they can be treated and how it can be prevented.
- ◆ explanation of at least two milk contracts in regard to buyers payment terms for milk compositional and hygiene quality standards.

National Unit specification: support notes

Unit title: Milking (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 is an optional Unit within the National Certificate in Agriculture at SCQF level 6, but can also be taken as a freestanding Unit. Practical delivery of this Unit could be integrated with the Unit *Dairy Production* (SCQF level 6). It would be beneficial if candidates had some prior knowledge of livestock.

In this Unit candidates are required to develop the specialist skills and knowledge required to milk cows. They will learn about milk production, secretion and let down in the udder and the importance of hygienic milk harvesting. Candidates will also learn the operation, cleaning and maintenance of milking and ancillary dairy equipment. Candidates will gain specialist knowledge in mastitis control, milk recording and understanding regarding milk payment structures. This Unit should prepare candidates for progression to Higher National Units, Scottish Vocational Qualifications, other related land-based qualifications or to related employment.

In Outcome 1, the basic components of the udder should include the suspensory ligaments, alveoli, alveolar ducts, gland cistern, sphincter muscle, teat cavity, teat canal. The importance of oxytocin, blood flow to and from udder, udder stimulation and milk let down, should be acknowledged.

Outcome 2 will provide candidates with the opportunity to develop practical skills and knowledge in relation to the hygienic and efficient milking of livestock, whilst supervised.

Candidates will be expected to be able to:

- ◆ check milk pump oil levels and belt tensions.
- ◆ prepare a milking parlour and bulk tank for milking.
- ◆ check vacuum levels are correct.
- ◆ move cows from field/housing to collecting area.
- ◆ prepare cows for milking according to farm standard operation procedure.
- ◆ milk cows according to standard operating procedure.
- ◆ identify and dispose of milk unsuitable for consumption in accordance with instructions.
- ◆ complete milking procedure according to standard operating procedure.
- ◆ clean and disinfect work area and equipment to the farms standard operating procedure.

Outcome 3 provides candidates with underpinning knowledge in relation to monitoring the production and progress of cow milk production. Candidates should know how to access, interpret, analyse and record individual cow milk performance data.

Candidates should be able to monitor and understand graphical milk production trends including lactation curves and 305 day corrected lactation curves for individual cows and groups/herds.

National Unit specification: support notes (cont)

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In Outcome 4, candidates should be familiar with examining and interpreting different milk contracts, milk hygiene and compositional measurements and milk cheque payments. Candidates should be aware that differences in breed, age, stage in lactation, nutrition and health can influence milk quality, as can environmental factors such as housing and equipment cleanliness standards and protocols. This Outcome will allow candidates to gain knowledge in contagious and environmental mastitis infection types, infection routes, the importance of clean work practices, ensuring teat health and the use of intra-mammary infusions, anti inflammatories, dry cow therapy and teat sealants. Candidates should be exposed to cow identification systems which highlight animals undergoing treatment and milk that is unsuitable for human consumption.

This Unit is broadly aligned to the following National Occupational Standards (NOS) from Lantra:

- LP13 Prepare for carry out and complete the milking of livestock
- LP35 Prepare monitor and maintain the milking of livestock by machine

Guidance on learning and teaching approaches for this Unit

This Unit should be delivered in as practical a context as possible with delivery taking place on a dairy farm to learn about milk production and milk harvesting, and in a classroom. The emphasis should always be on the practical application of knowledge and understanding.

Candidates would benefit from a balanced approach to learning by undertaking visits to dairy farms operating a range of milking systems and participating in classroom activities to develop knowledge and skills in milking. Work experience on a dairy farm could be beneficial.

By adopting the above learning and teaching approaches and/or through the Outcomes and corresponding Evidence Requirements, the Unit should provide candidates with an opportunity to develop the following essential skills for life, learning and work:

- ◆ Employability — through developing practical skills in line with good farm practice and working on time limited tasks.
- ◆ Sustainability — through considering the use of resources and recycling.
- ◆ Technical skills — through operating milking equipment and working with livestock.
- ◆ Organisational skills — in terms of personal management through punctuality, record keeping.
- ◆ Interpersonal skills — through contact with farm staff and in class groups.

National Unit specification: support notes (cont)

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Guidance on approaches to assessment for this Unit

A holistic approach to assessment of Outcomes is encouraged, and the following approaches to assessment suggested.

- Outcome 1: This could be assessed by a combination of labelling diagrams and a short written question paper.
- Outcome 2: This could be assessed by carrying out a milking under supervision, supported by an assessor observation check-list.
- Outcome 3: A written assignment or report could be used, combined with a practical work experience.
- Outcome 4: An assignment could be set for a farm scenario or milking situation.

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).

Opportunities for developing Core Skills

In this Unit candidates will develop knowledge and skills in milking cows, maintaining animal health, operating and maintaining milking systems and achieving high levels of hygiene in the work area and in dairy plant and equipment. Candidates will:

- ◆ identify anatomical and physiological components of the udder.
- ◆ prepare, operate and maintain plant and equipment for milking.
- ◆ carry out milking in accordance to a standard operating procedure.
- ◆ maintain records associated with milking.
- ◆ interpret and analyse milk production information from milk records.
- ◆ maintain milk hygiene and udder health.

This means that as they are doing this Unit candidates may develop aspects of the Core Skills of *Communication*, *Numeracy* and *Problem Solving*.

National Unit specification: support notes (cont)

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In addition aspects of the following Core Skills could be developed where particular learning and teaching approaches are adopted:

- ◆ *Working with Others* — through group work, eg to collect data in relation to milk production
- ◆ *ICT* — through recording data electronically or investigating milk records
- ◆ *Numeracy* — through the recording and analysis of data

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 |
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