Unit 22: Undertake Beef Production

Unit code: M/600/9581

QCF Level 3: BTEC National

Credit value: 10

Guided learning hours: 60

● Aim and purpose

This unit aims to develop learners skills in beef stock production and an understanding of how these can be applied in practice. The unit is designed primarily for learners in a centre-based setting looking to progress into the sector or onto further education.

● Unit introduction

Food issues are a high priority on the Government's agenda and the agriculture industry needs an increasingly skilled workforce to produce the nation's food supply. The average age of the UK agricultural workforce has increased and has now reached almost 60.

This unit focuses on training and developing a skilled workforce in two ways. Firstly, learners will develop and improve their practical skills within a commercial farm background.

Secondly, and equally important, the learners will develop skills in enterprise monitoring and critical analysis of performance through carrying out practical tasks, recording information and analysing herd data performance figures to identify areas of strength and weakness. Throughout the unit learners will need to work effectively as a member of a team, sometimes in taught groups and sometimes in a farm duty or work experience situation.

Health and safety procedures will be emphasised in all practical sessions.

● Learning outcomes

On completion of this unit a learner should:

1   Know beef production systems used in the UK

2   Understand principles of suckler herd health and breeding

3   Be able to perform routine beef stock skills

4   Be able to complete and use beef management records.

Unit content

1 Know beef production systems used in the UK

Beef breeds and characteristics: identify native and continental breeds; beef terminology (eg entire, steer, store, conformation, hybrid, polled, killing-out percentage-ko%, marbling); early and late maturity; characteristics of growth (eg effect of sex); identify the meat cuts in the animal

Types of production systems: intensive (eg cereal beef); semi-intensive (eg silage beef, 18-24 month, store systems); extensive (eg suckler beef); targets for systems (eg growth rates, daily live-weight gain (DLWG), finishing weight, food conversion); market requirements; live-weight and deadweight selling; carcass classification and grading; health problems associated with beef systems; housing and handling systems; welfare and codes of practice

2 Understand principles of suckler herd health and breeding

Production cycle and herd health: choice in time of calving and weaning; oestrous cycle; body condition score of cow; nutritional requirements; herd health and diseases

Breeding management: choice of breed; bull and cow selection (eg use of Estimated Breeding Values-EBVs, interpretation of breeding data); calving management; management of natural service and artificial insemination (AI) eg heat detection, compact calving and artificial manipulation of the oestrus cycle, pregnancy diagnosis (PD); problems with re-breeding

3 Be able to perform routine beef stock skills

Calf tasks: handle and restrain calves (eg handling, temperature, halter); signs of health; disbudding; supernumerary teats; ear tag; vaccination; drench; dose; stomach tube; castration; feeding

Large animal tasks: weighing and recording; moving; dosing; body condition scoring- BCS; signs of health; vaccination; injection; select for slaughter; health and safety; feeding; grazing and stocking rates; housing

4 Be able to complete and use beef management records

Legislative records: passports; veterinary medicines; movement; dead stock

Performance records: weighing; feeding (eg amount, feed stock-taking, DLWG); market trends (eg prices, timing, carcass grades); unit costs of production and gross margin comparison

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P1 identify characteristics of given beef breeds	**M1** monitor growth and health in a specified beef system	**D1** identify the strengths and weakness in a specified beef system and suggest areas for improvement
P2 describe given beef production systems		
P3 outline key nutritional and health requirements for given beef production systems		
P4 explain the production of a suckled calf [CT, RL]	**M2** make suggestions for the improvement of a specified suckler beef system using EBVs	
P5 explain factors affecting suckler herd performance		
P6 complete risk assessment relevant to routine beef stock procedures		**D2** for a specified beef system, produce unit costs of production and identify areas for improvement.
P7 carry out routine beef stock procedures to meet given objectives [TW, EP, SM]		
P8 collect and use beef management data [IE]	**M3** produce a gross margin for a specified beef system.	
P9 complete beef management records in compliance with relevant legislative requirements.		

PLTS: This summary references where applicable in the pass criteria, in the square brackets, the elements of the personal, learning and thinking skills. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key			
	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Delivery

Delivery of this unit will involve practical and written assessments, visits to suitable collections. It could link to work experience placements.

Centres are encouraged to integrate theory and practical sessions wherever possible and to make use of the centre's own farm, together with links with local employers and businesses relevant to this unit.

It is essential that some farm information, physical and financial, is readily available, respecting the needs of confidentiality with local businesses.

The unit has been designed to enhance learners' practical skills as well as develop their critical analysis and reflective skills, especially where enterprise performance is being considered. This might form useful feedback to an employer or farm manager and result in a positive outcome for both parties.

Theory sessions are meant to build on and enhance the practical sessions to widen learner knowledge in relation to many of the routine tasks they carry out. Tutors should decide whether these theory sessions are delivered before or after the practical sessions. Learners should also visit relevant beef enterprises, such as local farms, abattoirs, markets, feed mills and breeding centres.

Teamwork and health and safety must be an integral part of every session.

Learning outcome 1 should include a visit to a local market with a wide range of beef breeds on offer. Similarly, learners can gain experience of different beef systems in theory sessions and also from visits to local farms.

Learning outcome 2 will involve links with a suckler herd or similar system. Where a centre's own farm does not have one, tutors need to establish links with one in their locality.

Learning outcome 3 is largely practical. Health and safety must be strictly adhered to and should also feature biosecurity measures. Learners could be assessed on work experience or when involved in carrying out duties on the centre's own farm.

Learning outcome 4 will be delivered in the final part of the programme and should form a useful summary of what has been learned to date. Access to farm records will be necessary.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives **an indication of the volume of learning it would take the average learner** to achieve the learning outcomes. It is **indicative and is one way of achieving the credit value.**

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit.
Assignment 1: Beef breeds and Systems (P1, P2, P3, M1, D1) and briefing session.
Theory session: welfare issues and codes of practice, safety issues, beef breeds, growth patterns, breeds for systems of production.
Theory session: production targets for beef systems, feeding, health and disease issues, nutritional requirements.
Practical sessions: identify breeds, visit market and abattoir.
Assignment 2: Suckler Beef Production (P4, P5, M2) and briefing session.

Topic and suggested assignments/activities and/assessment
Theory session: production cycle of sucklers, timing of calving, health and disease, nutrition and grazing.
Theory session: breeding and improvement using EBVs, the oestrus cycle, calving index, fertility problems, heat synchronisation techniques, pregnancy diagnosis.
Practical session: signs of health, heat synchronisation, PD, visit suckler units.
Assignment 3: Routine Beef Stock Tasks (P6, P7) and briefing.
Theory session: vaccination and immunity, housing, stocking rates.
Practical session: calf and adult tasks that include care of the newborn calf, handling, disbudding, spare teat removal, ear tagging, vaccination, weighing, drenching, body condition scoring, select for slaughter, grazing.
Assignment 4: Beef Enterprise Performance (P8, P9, M3, D2) and briefing.
Theory session: legislative records, welfare, health and safety.
Theory session: performance records, carcass grades, market requirements, costs of production.
Practical session: weighing and recording, monitoring growth rates, visit beef units.
Unit review.

Assessment

For P1, learners must be able to recognise both native and continental beef breeds that are used in UK beef production systems, as well as the various cross-breeds. Evidence could be a written description, a presentation or a test. Learners are also expected to describe the various characteristics of these breeds.

Learners need to understand the many different beef systems that exist, and for P2 they need to understand concepts such as early and late maturity and production targets for the various systems. For P3, learners must describe the main nutritional and health requirements for specified beef systems. They should be able to state amounts of feed fed per head per day as well as the normal health preventative measures in place in beef units. For P4, learners must describe, for a specified system, the timing of insemination and management of a suckler cow until she calves and the rearing of the calf. For P5, learners should list the factors that affect suckler cow performance and include nutrition, the environment and housing.

For P6, learners must complete at least two risk assessments before carrying out beef stock tasks. One assessment could be for calf stock tasks and one for adult beef stock tasks. The same template should be used by all learners. P7 can be assessed during relevant beef stock practical sessions and tutors need to ensure that several tasks are included so that learners can experience a broad range. For P8, learners need to collect and use beef management data. Examples that might be used are growth rates, daily live-weight gain calculations, the formulation or adjustment of rations. For P9, learners need to complete beef management records in line with legislative requirements, for example passport applications. Useful material is available from the British Cattle Movement Service. Other documentation could include movement records such as when sending animals to slaughter or market.

For M1, learners are to monitor growth and health in a specified beef system. Tutors must choose both the timing of and the time limits for the assessment carefully. Learners may need access to farm records. Care should also be taken to ensure that that there is equality of monitoring, some learners might choose adult cattle to monitor, where there might be fewer health issues to monitor than in a calf rearing one unit. For M2, learners must understand how EBVs work and be able to select bulls that are likely to improve the carcass or growth characteristics of the finishing animals. It would be desirable for the tutor to select a suckler herd where EBVs are not used. For M3, learners must produce a gross margin for a specified beef system. They should present the gross margin correctly, and include detail of figures used in their calculations, for example where they state output/sales they should state the selling price that their calculations are based on. There are various examples that learners can be guided by in the published data referred to in the indicative reading list.

For D1, learners should be reasonably familiar with a specified beef system. This might be one from their recent work experience, the centre's own enterprise, or one at home. Learners must aim to identify all relevant factors such as health and disease, housing and environment, nutrition, welfare, and labour input. They need to identify the strengths and weaknesses of the beef system and suggest improvements. For D2, learners should choose their own system with tutor guidance. This might stimulate their interest and could provide useful feedback to employers or farm managers. Tutors might also consider how evidence is presented and link this with the communication areas within Functional Skills. Learners will need access to farm information.

Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, M1, D1	Beef Breeds and Systems	You are to identify breeds for specified beef systems, monitor and assess how they are fed and kept healthy, and identify areas for improvement in a beef system.	Practical observation and assessments. Written evidence.
P4, P5, M2	Suckler Beef Production	Describe the management of a suckler herd from the time of calving through a whole production cycle and suggest how improvements can be made using EBVs.	Practical observation and assessments. Written evidence.
P6, P7	Routine Beef Stock Tasks	Carry out specified beef stock tasks over a given period of time in a safe manner.	Practical observation and assessments. Written evidence.
P8, P9, M3, D2	Beef Enterprise Performance	For a specified beef system, you are to produce physical and financial data to identify strengths and weaknesses of the system.	Practical observation and assessments. Written evidence.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC land-based sector suite. This unit has particular links with:

Level 2	Level 3	
Introduction to Farm Animal Production	Element LP25.1 Deliver basic treatments to livestock Element LP30.1 Prepare livestock accommodation Element LP30.2 Receive livestock into, and evaluate, accommodation Element LP48.1 Promote and maintain the health and well-being of livestock	
	Understand and Promote Animal Health	
	Understanding Livestock Breeding and Nutrition	

Essential resources

Learners will need access to a suckler herd and a rearing/finishing beef system with appropriate safe handling facilities and equipment. They will also need access to farm recording systems and relevant information used for recording, to monitor and analyse animal performance.

Employer engagement and vocational contexts

This unit focuses on how beef enterprises operate and learners should have access to relevant commercial enterprises. This may include the centre's own farm but should also, where possible, include work experience farms, local markets, relevant industry links such as abattoirs, breeding centres, feed mills, national shows such as the annual beef event, and other local farms. Learner experience and employability will be enhanced if they achieve National Proficiency Test Training, for example Telescopic Forklift Handling, Safe Manual Handling or Use of Veterinary Medicines.

Indicative reading for learners

Textbooks

Allen D – *Planned Beef Production and Marketing, 3rd Edition* (Blackwell Science, 1990) ISBN 0632026111

Allen D – *Rationing Beef Cattle* (Chalcombe Publications, 2001) ISBN 0 948617 446

Ball P and Peters A – *Reproduction in Cattle, 3rd Edition* (Blackwell Publishing, 2004) ISBN 1405115459

Fuller R – *Suckled Calf Production* (Chalcombe Publications, 1998) ISBN 0 948617 40 3

Hulsen J and Swormink BK – *From Calf to Heifer* (Roodbont, 2006) ISBN 10: 90 75280 95 5

Nix J – *Farm Management Pocketbook, 39th Edition* (The Andersons Centre, 2009) ISBN 0954120159

Porter V – *The Field Guide to Cattle* (Voyageur Press, 2008) ISBN 13: 978 0 7603 3192 7

Soffe R and McConnell P – *The Agricultural Notebook, 20th Edition* (Blackwell Science, 2003) ISBN 0632058293

Straiton E – *Cattle Ailments* (Crowood Press, 2008) ISBN 978 1 86126 383 4

Thickett B, Mitchell D and Hallows B – *Calf Rearing* (Farming Press, 2003) ISBN 186126643X

Thomas H – *Storey's Guide to Raising Beef Cattle* (Storey Books, 2000) ISBN 1580173276

Journals

Beef Farmer

Farm Business

Farmers Guardian

Farmers Weekly

Websites

www.bcms.gov.uk	British Cattle Movement Service
www.dardni.gov.uk	Department of Agriculture and Rural Development
www.defra.gov.uk	Department for Environment Food and Rural Affairs
www.eblex.org.uk	English Beef and Lamb Executive
www.fawc.org.uk	Farm Animal Welfare Council
www.mlc.org.uk	Meat and Livestock Commission
www.rpa.gov.uk	Rural Payments Agency
www.tradingstandards.gov.uk	Trading Standards

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are …
Independent enquirers	researching evidence from published statistics and other general information
Creative thinkers	outlining beef farm production
Reflective learners	suggesting methods of improvement to beef farm enterprises
Team workers	engaged in practical groups in taught sessions and in small teams in a work situation
Self-managers	working to deadlines, and managing their research skills and time
Effective participators	working in a team carrying out farm practical skills.

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	analysing farm data to suggest improvements to a beef enterprise
Creative thinkers	suggesting methods of improvement to beef farm enterprises
Reflective learners	comparing and contrasting their experience with what they have learned
Team workers	working as part of a team in a commercial situation
Self-managers	organising own work and home schedule within a commercial environment
Effective participators	working in a team in commercial farm work.

Functional Skills — Level 2

Skill	When learners are ...
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	recording, identifying, calculating and analysing farm information such as growth rates, daily live-weight gains, electronic passport applications, unit cost analysis
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	
Manage information storage to enable efficient retrieval	
Follow and understand the need for safety and security practices	
Troubleshoot	
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records	
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	
Evaluate the selection and use of ICT tools and facilities used to present information	
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	

Skill	When learners are ...
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	producing calculations for feed rations
	compiling and calculating unit costs of production
	analysing and calculating volumes and densities
	presenting accounting information
Identify the situation or problem and the mathematical methods needed to tackle it	
Select and apply a range of skills to find solutions	
Use appropriate checking procedures and evaluate their effectiveness at each stage	
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	
Draw conclusions and provide mathematical justifications	
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting researched information from own observations and published material in a variety of ways
	understanding and interpreting instructions given for various tasks
	communicating within a small team of skilled staff in a commercial situation.
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	