Unit 13: International Beef Production

Delivery guidance

Approaching the unit

Unit 13: International Beef Production is an internal optional unit available to learners studying the Level 3 International Diplomas in Agriculture (at 540, 720 and 1080 GLH). This unit is both a knowledge- and a skills-based unit and learners will find the knowledge, understanding and skills developed in this unit invaluable when pursuing a career in any aspect of the agricultural industry.

Tutors should use a wide variety of methods in the classroom-based sessions in order to ensure that learners achieve a good level of knowledge and understanding of beef production systems used; diet management and health and production targets; and the routine husbandry practices of cattle during the production cycle. This unit demands that knowledge is combined with extensive practical learning and it is envisaged that the centre facilities will be used along with strong external connections with beef producers and employers.
Guest speakers from the agricultural industry, such as beef producers, would also enhance the learners' experience when delivering this unit.

Delivering the learning aims

Learning aim A

This unit could be introduced by discussing the importance of legislation and welfare standards in key aspects of beef production, such as culling, husbandry and sustainability. This will lead seamlessly into learning aim A, which focuses on the beef production systems used. This learning aim draws upon the knowledge learners will receive from *Unit 9: International Poultry Production*, *Unit 10: Farm Livestock Husbandry*, *Unit 11: International Pig Production*, *Unit 12: International Sheep Production*, *Unit 14: International Dairy Production, Unit 15: Livestock Health and Diseases*, and *Unit 16: Livestock Nutrition*, establishing any prior knowledge that learners have of beef production. This is because there will be similarities regarding the methods and processes when producing any livestock and this can be drawn upon by learners when studying the unit.

Learners require a sound knowledge and understanding of the importance of the welfare needs of cattle and how these needs can be met, as well as the variation in the different production systems and their impact upon cattle welfare, husbandry, management and production numbers.

It is envisaged that once learners have a good understanding of the current conditions in the beef industry, tutors can then cover the different production systems and maintenance of welfare standards of cattle, as well as the targets for these systems such as growth rates, daily liveweight gain, finishing weight and food conversion. Tutors will need to cover the factors that affect the decisions as to which production system is to be used, as well as cattle breeds, liveweight and deadweight selling and carcass classification. Biosecurity, environmental impacts and pollution control will also have to be considered.

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Preparation for breeding including the suitable selection of animals to meet production aims and welfare standards must be investigated. This will also involve the need to comply with breeding policies and regulations. This will need to be delivered through classroom-based and practical sessions, as well as visits to other producers. Learners will also need to have an understanding of how stock is selected for sale, including the grading of finished animals, saleability and performance indicators.

Learning aim B

For learning aim B, learners will need to carry out diet management and feeding practices during the production cycle to maintain health and production targets. In order to do this, classroom-based sessions will initially be required to ensure that learners have secured a thorough understanding of the nutritional requirements of cattle and how this changes throughout their different life and production stages. Presentations, tutor-led discussions and active learning sessions will need to take place in the classroom to ensure that learners understand the nutritional requirements and how these are met in the different beef production systems.

In addition, learners will also need to have an awareness and understanding of the different types of cattle diet available and its uses, including any causes, treatments and prevention of common nutritional problems and deficiencies.
Practical activities will enhance learners' understanding and skills regarding the use and recognition of different cattle feeds, following different feeding plans and using different feeding equipment. A variety of offsite visits can be arranged to give learners the opportunity to assess grazing methods such as grass height, stocking rates and feed intake first hand, as well as different grazing systems and their aim to lower farm carbon footprints and improve herd health.

Learning aim C

For learning aim C, learners will need to know how to carry out routine husbandry of cattle during the production cycle to meet current welfare and husbandry standards. They will need to consider the preparations required for pre-calving and calving, such as feeding programmes and methods, identifying cows that need assistance, and scanning and marking. Learners will have to be able to demonstrate their knowledge regarding the care of calves, maintaining high levels of animal welfare in accordance with legislative requirements and best practice.

This learning aim would be best delivered initially through active learning such as discussions, group activities and individual activities in a classroom-based setting to ensure a sound knowledge and understanding of the welfare needs and legislative demands when producing beef. Practical activities can be arranged in a beef production setting (ideally with a variety of production systems such as both indoor and outdoor) or if this is not possible, practical work can be carried out in one setting while tutors can arrange for visits to other production systems. This will give learners the opportunity to witness the husbandry practices of cattle in different types of production systems. Guest speakers can also be invited into the centre to discuss these practices and assist learners with any queries they may have relating to the industry.

Assessment model

Learning aim	Key content areas	Recommended assessment approach
A Investigate beef production systems	**A1** Beef production systems **A2** Preparation for breeding **A3** Selecting animals for sale, end of use and the role of performance indicators	A report on a selected beef production system and the production cycle.
B Carry out diet management and feeding practices during the production cycle to maintain health and production targets	**B1** Nutritional requirements **B2** Diet management and feeding practices **B3** Grazing **B4** Nutritional problems	A portfolio of evidence, to include: ● planning documents ● evidence of carrying out routine beef cattle feeding and husbandry tasks to meet current standards and health and production targets.
C Carry out routine husbandry of cattle during the production cycle to meet current welfare and husbandry standards	**C1** Routine husbandry **C2** Care of calves	

Assessment guidance

This unit is an optional internally assessed unit available for the Level 3 International Diplomas in Agriculture (at 540, 720 and 1080 GLH), which is assessed using a number of independent tasks. The recommended assessment approach suggests two different assignments.

The first assignment covers learning aim A, which is a written report where learners are to concentrate on beef production systems and the beef production cycle. In order to gather the evidence for this learning aim, tutors can arrange for learners to embark on practical activities working with cattle in different production systems. They can also organise various visits to relevant establishments with different beef production systems and/or talks from guest speakers such as beef producers from the industry. This will allow learners to compare and contrast different production systems and select the one that they would like to report on for their summative assessment.

The second assessment covers learning aims B and C and learners are required to build a portfolio of evidence that demonstrate they have considered planning documents; evidence of carrying out routine cattle husbandry and feeding tasks safely; and meeting industry standards as well as following health and safety requirements. In order to gather the research for this assessment, learners will be able to use the practical activities carried out while completing the unit. In addition, the offsite visits and guest speakers can help by outlining the routine husbandry practices, grazing and feeding requirements in different beef production systems.

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Getting started

This provides you with a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 13: International Beef Production

Introduction

This unit gives learners an understanding of the different beef production systems used and their advantages and disadvantages for welfare and production levels.
Learners will gain a sound knowledge of all the different production systems and how these systems maintain the health and welfare of cattle for a range of different purposes.

Learning aim A – Investigate beef production systems

- Tutors could begin this learning aim with a discussion establishing any prior learner knowledge. This can lead to a description of the different production systems, what they involve and the considerations of these, as well as any welfare implications of them (e.g. slatted floors that can lead to foot problems).
- For learning aim A1, tutors can deliver a presentation about the current welfare standards in beef production. This can include the advantages and disadvantages of different systems, including intensive, cereal beef, semi-intensive, silage beef, 18-24 month, store systems, extensive and suckler beef.
- Tutors can form learners into small groups to research intensive, semi-intensive and extensive production systems. They are to research their allocated system and produce a poster stating their advantages, disadvantages and the welfare implications as well as current public opinion. These posters can be copied and distributed to the class so that they have a comprehensive set of notes for reference.
- Tutors can deliver a presentation about the targets for systems including growth rates, daily liveweight gain, finishing weights and food conversion. Learners can then be formed into small groups and allocated one target to research and produce a spider diagram of their findings to present to the class in a discussion.
- Learners can be formed into different small groups to research the factors that may affect a farmer's choice of production system, including financial, economic and marketing factors, location, current trends in farming practices, environmental factors and legislative requirements. The findings from this research will be presented in a class discussion.
- Tutors can arrange for a guest speaker, such as a beef producer, to come into the centre to talk to learners about liveweight and deadweight selling, carcass classification and grading, current trends and market changes. This can be followed by an organised visit to a livestock auction where learners can look at the different prices that beef cattle sell for and what influences these prices.
- Learners can be formed into different small groups and tutors can allocate each one with one different production system. They are then to identify the most suitable cattle breeds (both native and continental) along with their associated characteristics for that production system.
- Learners are to research different beef terminology and the different cuts of beef, such as entire, steer, store, conformation and marbling. Tutors can write up learners' findings on the board to ensure accuracy, and then learners can add these terms to a personal glossary for reference throughout the delivery of the rest of this unit.
- Tutors can deliver a short presentation about the importance of different

biosecurity measures and disease prevention used in beef production.

- Learners can then complete a matching activity where they are given different scenarios (such as outbreaks of disease on their farm and outbreaks of disease at a local auction) with various biosecurity measures including disinfection, beef dips etc. They are then to match the two together and explain why they are the most appropriate for that scenario.
- Facilitate a class discussion about the environmental impact of biosecurity measures and ways that this impact can be reduced.
- Learners are to carry out practical work with cattle, working through a practical book to ensure that they cover health and safety, movement of cattle, preventing pest and vermin in beef production systems, feeding and watering using a range of different systems and a range of bedding types. They are to record evidence of this in their practical workbook as they go along.
- Tutors to facilitate a class discussion about the legislation governing beef production and the welfare implications of beef production, which will include culling, husbandry, transport and sustainability.
- Ask learners to jot down on sticky notes the welfare implications of housing and handling systems, culling, husbandry and sustainability. They are then to feed back their ideas to the rest of the class.
- Learners are to form into pairs and tutors allocate each pair with different housing- related welfare issues including slatted floors, lighting and ventilation, space, poor hygiene, nutrition, lack of pain management, physiological and psychological stress and health problems associated with beef systems. They are to research them and produce factsheets. These factsheets can be copied and distributed to the group to ensure all learners have a comprehensive set of notes for reference.
- For learning aim A2, tutors can deliver a short presentation on the factors to consider when selecting stock for breeding to meet production aims and welfare standards.
- Working in small groups, give learners case studies about different cattle breeds (e.g. Herefords and Charolais) with varying characteristics, and ask them to rank them in order of the most suitable for breeding to the least.
- Tutors to deliver a presentation on the different reproductive technologies available in beef production, such as artificial insemination and sexed semen. Arrange for a guest speaker to come into the centre and discuss the advantages and disadvantages of each technique.
- Learners are to participate in multiple practical activities in the centre's cattle area, recording information and then gathering evidence in their practical books. They are to assess and evaluate a bull and a cow prior to breeding. This should include the following: health check both cattle herds and individual cows; body condition score beef; and carry out behavioural assessments both on herds and individual animals.
- Tutors to deliver a presentation on the signs and indicators of ovulation, the oestrus cycle, the role of hormones, heat observation and optimum time for service.
- Arrange for another guest speaker (ideally a vet) to come into the centre to talk to learners about pregnancy diagnosis techniques, andrology, sperm analysis and principles and application, and health and safety throughout the preparation for breeding.
  For learning aim A3, tutor to deliver a presentation on the factors that affect the choice of animals for sale, including their assessment, grading and finishing weights.

- Learners are to form into pairs to research saleability factors, selection factors and the preparation of animals for market and slaughter. They can then feed back their findings through a class discussion.
- Facilitate a tutor-led discussion about the current legislation governing transport, including WATO and records that must be kept.
- Invite a guest speaker to visit the centre (ideally a local beef producer) to talk to learners about performance indicators and calculations, such as calving percentage, mortality rates, financial indicators and productivity.
- Throughout the delivery of this learning aim, learners will have carried out classroom sessions, practical sessions and employer involvement that they can utilise when producing their summative assessment. This should be in the form of a written report looking at UK beef production systems and the beef production cycle.

Learning aim B – Carry out diet management and feeding practices during the production cycle to maintain health and production targets

- Tutors can begin this learning aim with a short discussion to recap and establish any prior learner knowledge regarding different nutrients.
- For learning aim B1, facilitate a group discussion about the different nutritional requirements of cattle at the different life stages/stages of growth and development (including newborn, juvenile, adult, pregnant and finishing) as well as different feeding systems.
- Learners can participate in multiple practical activities where they must select the appropriate equipment, prepare feeds and feed calves, while tutors observe and provide witness statements for learners' portfolios of evidence.
- For learning aim B2, learners are to work in the cattle areas and identify the different feeding and watering equipment. They are then to discuss the advantages and disadvantages of this equipment in terms of efficiency, ease of use, hygiene and cleaning.
- Learners are to participate in a practical activity where they must examine cattle feed and assess its quality, interpreting the nutritional content from the packaging. They will then examine feed storage and assess its suitability for maintaining feed quality and preventing contamination.
- Facilitate a class discussion about feeding records and recording systems, as well as weight gain at different stages and the importance of recording weights.
- Tutors to deliver a presentation on the changes to nutritional requirements when weaning, pregnant and finishing.
- A practical activity should be carried out where grazing is assessed for its suitability for beef cattle.
- For learning aim B3, facilitate a class discussion about the advantages and disadvantages of the different grazing methods including continuous, rotational, diversity of grass species and quality of grazing.
- Arrange for an offsite visit so that learners can witness first-hand grazing and stocking rates, as well as how employers assess and establish grazing systems to lower farm carbon footprints and improve herd health.
- For learning aim B4, tutors can deliver a short presentation on the common nutritional problems in cattle, such as poor appetite, reduced growth and lethargy.
- Learners can be formed into small groups and are allocated with different nutritional problem. They are to conduct research and produce a poster outlining the causes of the problem, its recommended treatment(s) and prevention. These posters can be copied and distributed to the class so that they have a comprehensive set of notes for reference.

- Tutors to deliver a short presentation about the nutritional diseases and disorders in beef cattle, such as specific nutrient deficiencies, excesses, parasitism and disorders. Carry out a practical activity where grazing is assessed for its suitability for beef cattle.
- The summative assessment for learning aim B should be in the form of a practical portfolio and learners will have gathered evidence for this throughout the practical sessions. Formative assessments can take place during the course of the practical sessions.

Learning aim C – Carry out routine husbandry of cattle during the production cycle to meet current welfare and husbandry standards

- Tutors could begin this learning aim by facilitating a group discussion about the routine husbandry requirements of cattle. Ask learners to draw upon their practical experience from learning aim A and build on the notes they have taken from their practical workbooks.
- For learning aim C1, learners are to undertake a substantial amount of practical sessions working with cattle and calves. They should be involved in all aspects of husbandry and practical workbooks (or portfolios) should be used to ensure that learners are competent at carrying out routine husbandry with cattle.
- Within their practical sessions, learners will cover housing, bedding, equipment, biosecurity, feeding, watering, health checking and maintenance, use of preventative treatments including endoparasite and ectoparasite treatments, observing vaccination and nutritional supplements. Cattle husbandry should also include handling and restraining and temperature monitoring. Calf husbandry should also include handling and restraining, temperature monitoring, use of halters, grooming, transport, inspection, marking and clipping and identifying lameness.
- Tutors to deliver a short presentation about the records that need to be kept when keeping cattle for beef production and the legislative requirements of beef cattle records.
- Learners are to form into pairs and create spider diagrams about all the issues they can think of in beef production and suggest ways of minimising these issues.
- Learners are to prepare notes about isolation, why we isolate, when to isolate and how, which should then be discussed as a class.
- For learning aim C2, facilitate a class discussion about the care of calves and pre- calving and how high welfare standards impact upon survival rates and reduce instances of mortality.
- Arrange for a visit or practical activity in the centre's beef area when calving is taking place (or the use of video footage if this is not possible) and observe a range of instances where calves require care.
- Learners are to form into pairs and tutors can allocate each pair with one factor related to the care of a new-born calf, such as temperature taking, disbudding, removal of supernumerary teats, ear tagging and castration. They are to carry out research and produce factsheets. These factsheets can be copied and distributed to ensure all learners have a comprehensive set of notes for reference.
- Learners to participate in an interactive whiteboard activity where they approach the board and annotate it with disease prevention methods in cattle and calves. This can be followed by a class discussion using these annotations.
- As with learning aim B, the summative assessment for learning aim C is a portfolio of evidence. Learners will have completed the practical activities, offsite visits and talks from guest speakers and should be collecting evidence throughout to add to their portfolios.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

This unit links to:

- Unit 9: International Poultry Production
- Unit 10: Farm Livestock Husbandry
- Unit 11: International Pig Production
- Unit 12: International Sheep Production
- Unit 14: International Dairy Production.

Resources

In order to deliver this unit, centres will need access to a range of different livestock in order to carry out practical husbandry, feeding and breeding activities. If there is only one beef production system at the centre, liaison with other beef producers will be required.

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Internationals in Agriculture/Horticulture/Land-based subjects. Check the Pearson website (http://qualifications.pearson.com/endorsed-resources) for more information as titles achieve endorsement.

Textbooks

Gillespie J and Flanders F, *Modern Livestock and Poultry Production*, CENGAGE Delmar Learning, 2009 ISBN 9781428318083 – A useful text that covers the different production of all livestock

Herring AD, *Beef Cattle Production Systems (Modular Texts)*, CABI Publishing, 2014 ISBN 9781845937959 – A useful text that outlines the different beef production systems

Royer S and Royer N, *Raising Beef Cattle for Dummies*, John Wiley & Sons, 2012 ISBN 9780470930618 – A very easy-to-follow text that outlines beef production and the raising of cattle

Watson JS and More JA, *Breeding and Rearing of Cattle – Milk and Beef Production*, Hervey Press, 2014 ISBN 9781446530160 – A useful text that focuses on the breeding and rearing aspect of cattle for beef production

Websites

'Gov.uk' – search for 'Animal Welfare' for DEFRA, the government organisation that outlines the animal welfare and legislation of keeping, transporting and maintaining records when keeping livestock

'National Beef Association (NBA)' – website for more information about this UK organisation dedicated to the production and welfare of beef cattle

'Royal Society for the Prevention of Cruelty to Animals (RSPCA)' – website to find out more information about the welfare of farm animals in the UK

Pearson is not responsible for the content of any external internet sites. It is essential for tutors to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that tutors bookmark useful websites and consider enabling learners to access them through the school/college intranet.