Unit 15: Livestock Health and Diseases

Delivery guidance

Approaching the unit

The focus of this unit is on learners developing the skills required to assess the health of livestock species, deliver basic treatments for ill health and to plan strategies for livestock health management.

Learners need to know how and why pathogens and parasites cause ill health and affect productivity, the reasons and methods of controlling the spread of disease on and off the farm and the wider implications of this to national laws and regulation relating to agriculture.

Learners will need to be able to interact with a variety of livestock species. This will allow them to become familiar with the visual and behavioural indicators of good and poor health, as well as developing their practical skills in administering basic health treatments, which are essential for a career working with livestock. It would be useful to deliver this unit alongside *Unit 10: Farm Livestock Husbandry*, as many of the skills will be developed through both units and evidence of health assessment and management is likely to be naturally occurring while carrying out livestock husbandry tasks.

Employers should be encouraged to participate in the delivery and assessment of the unit where possible. If learners are involved with the routine husbandry of livestock species, there will be many opportunities for them to collect evidence in order to meet the assessment criteria. Tutors could also ask local veterinarians to deliver technical workshops, sharing their expertise and outlining both the practical and legal aspects of identifying and treating livestock infestations and diseases.

It might be more suitable to deliver the unit in a more holistic manner than indicated by the learning aims, depending on the access to livestock species available throughout the year. This could be achieved by taking each species in turn and examining the whole process from pathogens, symptoms, treatments and planning strategies to avoid and control infestations and disease development. Alternatively, each pathogen and parasite could be examined in turn, from structure through to practical management strategies.

Learners can develop their independent research skills by investigating livestock species of particular significance to their preferred career path. However, they will need to focus on cattle, deer, game birds, birds, goats, pigs, sheep and poultry for the purposes of assessing the unit, and so, using a variety of teaching resources and approaches will be necessary.

Access to a laboratory with microbiological equipment is useful for learners to appreciate the structure and scale of parasites and pathogens. Choose non- pathogenic bacteria for learners to view and work with and remember that their skills in operating a microscope are not as critical as their understanding of what they are viewing. It is more appropriate to provide samples under prefocused microscopes than to expect learners to prepare samples and set up microscopes.

Delivering the learning aims

Throughout learning aim A, learners should be given a variety of photographs, videos and animations to help them understand the concepts of the immune response. You could also use practical activities that involve all learners in demonstrating the spread of disease. Some useful resources for planning and managing these are included in the resources section of this delivery guide.

Learning aims B and C should be delivered and assessed through practical means where possible, but learner will also need to actively reflect on the practical activities they have carried out. You will need to make sure learners are organised in recording the detail of what they carry out, and that they are familiar with the processes of reflective practice.

Assessment model

Learning aim	Key content areas	Recommended assessment approach
A Understand how pathogens and parasites impact on livestock health management	**A1** Structure and reproduction of pathogens and parasites, and disease transmission **A2** Defence against disease	A report exploring the structure, growth, reproduction and transmission of disease caused by pathogens and parasites of livestock.
B Undertake health assessments for effective management of livestock health and welfare	**B1** Assessing general health in animals **B2** Livestock diseases and disorders	A portfolio of evidence, including: • witness statements and observation records of practical activities assessing the health of three different livestock species • witness statements and observation records of practical activities recording and monitoring livestock health • livestock health management plans and rationales • report on the management of two diseases and disorders and two infestations in livestock health, productivity and welfare planning.
C Explore livestock health management strategies to prevent and control ill health	**C1** Health and hygiene **C2** Theory and administration of basic treatments and health management **C3** Health planning, assessment, recording and monitoring	

Assessment guidance

Learners must create a report on the pathogens and parasites of livestock species for learning aim A. This could be a written report with suitable illustration, though a presentation, series of leaflets, blogs or vlogs would be equally valid.

Learners must select two species of **each** of the following organisms that may cause ill health in livestock:

- bacteria
- virus
- fungi
- parasites.

They must cover the key structures of each, factors affecting their growth and reproduction and the routes by which they can be transmitted.

Learners should then discuss the way that pathogens and parasites interact with the livestock host's immune system. This must include:

- physical and chemical components of the immune system
- adaptive B and T cells
- types of immunity, for example, natural active, artificial active, natural passive and artificial passive.

Learners should spend time carrying out research and carefully select their report format, so that they are able to demonstrate the depth of their understanding.

For learning aims B and C, a minimum of three health assessments of different livestock species must be undertaken by learners and supervised by a suitable assessor. The level of complexity of the situation and the competence of the learner must be referenced and signed witness statements included in the portfolio. There must be plenty of formative assessment opportunities allowing learners to assess a range of species and livestock at different ages, health status and production levels.

Learners could provide evidence of their practical work in the form of photographs or video recordings, along with presentation slides and notes, illustrated reports or other suitable formats to evidence their knowledge and understanding of health assessment.

Learners will also need to provide evidence for the part they play in implementing health management strategies, including hygiene maintenance, record keeping and administering healthcare interventions through a variety of routes of administration. Learners must not be assessed in the administration of treatments until they are of a suitable level of competence, so as to minimise stress and promote high standards of animal welfare.

Learners will need to research and report on the assessment and management of two diseases and disorders, as well as two infestations. These do not need to be diseases or disorders that learners are actively involved in managing, though if there are aspects that can be integrated into this, then this would be useful. This information can then be used to inform planning for health management strategies.

Learners must include written plans for health management strategies, which could be discussed either in a written format, through a semi-structured interview process or a combination of the two. They should be encouraged throughout the teaching of the unit to reflect on the health assessments and health management strategies they have been involved in. To meet the higher level assessment criteria, learners must be prepared to consider the following:

- the effectiveness of the strategies and actions taken in different contexts

- welfare and productivity levels
- identifying areas where their skills have been developed
- what went well, and any difficulties encountered for their own involvement in assessing and managing livestock health
- planning processes and legislative requirements
- alternative plans and actions that may be appropriate, and how these would be implemented.

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 15: Livestock Health and Diseases

Introduction

- This unit will help to prepare learners for managing the health of livestock in their care. Employer engagement will help to contextualise the unit for learners and progress their skills development in identifying, preventing and controlling ill health in livestock. You could involve employers in the following ways:
    - guest speakers, such as veterinarians, stockpersons and farm managers
    - technical workshops in health assessment and managing livestock health
    - contribution of ideas to assignments
    - assessment of practical skills in identifying key health indicators of livestock and implementation of health management strategies
    - opportunities for observation during work experience
    - support and mentoring.
- Previous BTEC learners who have successfully completed the course could also be asked to share their experiences or act in a mentoring capacity.

Learning aim A – Understand how pathogens and parasites impact on livestock health management

Tutors can introduce the unit by establishing the level of knowledge learners already have about ill health in livestock and the prevention and control of disease. Provide learners with the assessment model and assignment outlines, to ensure that they are aware of the need to evidence their practical skills development.

- Learners can take part in a class discussion, identifying the different livestock they have experience of, any common ailments that they already know about and how they may spread.
- Ask learners to classify these into their underlying causes (grouped into parasites and pathogens) and to further classify pathogens into bacterial, viral and fungal groups.
- Give learners diagrams of a range of pathogens and provide labels for important structures.
- Use 3D animations of bacteria, viruses and fungi to explore the differences between sizes and structures.
- Set up microscopes for learners to view bacterial and fungal structures.
- Discuss with learners how pathogens may cause damage to livestock and how this can impact on production and welfare.
- Learners are given images of parasites on a slide presentation. They should work independently to research the internal and external structure, life cycles and reproduction methods of given parasites from the unit content, which they then summarise and add into extra slides on their own presentation.
- Set up a laboratory practical to demonstrate the growth requirements of bacteria, fungi and viruses. Discuss the impact of these requirements on the success of the pathogens in a livestock environment.
- Ask learners to identify natural barriers to infection using a projected image that the class

can label. This can be extended to other features of the non-specific immune response.

- Learners could conduct independent research into the defence functions of blood.
- Show learners animated videos of adaptive immunity, then ask them to put together a summary of the key features of adaptive immunity and how they respond to defend the body.
- Provide props so that learners can perform a role play of the interactions of the adaptive immune response to pathogen invasion.
- Outline the processes involved in vaccination, providing real examples of different types of vaccines used and how each one works.
- Learners to put together a storyboard to show the development of different types of immunities.

Learning aim B - Undertake health assessments for effective management of livestock health and welfare

Certain criteria in this learning aim may be covered during the teaching of the pathogens and parasites in learning aim A. Wherever possible, learners should be interacting with and assessing the health of different livestock species.

- Give learners information on the normal ranges of weight, temperature, pulse, respiration and waste output of cattle. Discuss with learners how these measurements could be made, including the equipment and techniques that could be used. Ask them to think about how and why abnormal results occur.
- Learners to work individually to research the normal ranges for each of the other species listed in the unit content.
- Learners could work in small groups to collate their findings, and then explore the other factors that indicate whether an animal is in good or poor health.
- Discuss with learners the differences between health indicators and species, including the measurements that are taken (e.g. why temperature is likely to be taken for cattle, but not poultry).
- Learners could put together checklists of health indicators and condition scoring for relevant species.
- Tutors can arrange for a stockperson to come into the centre to deliver a technical workshop to learners, which can cover how to condition score, weigh and measure livestock. It would be useful for the stockperson to discuss the practicalities of organising the equipment and timing for this, the selection of livestock and how the tasks may be incorporated into routine husbandry.
- Provide photographs and videos of livestock as a springboard for discussing postural changes and what these may mean. Discuss how the environmental temperature, state of bedding, availability of space and cleanliness can affect health.
- Introduce the role and scope of the Animal and Plant Health Authority (APHA), including relevant procedures for disease notification.
- Ask learners to carry out assessments of livestock housing, and consider how this contributes to the health status of the livestock that occupy it.
- Ask learners to carry out research into the clinical signs, treatments, prognosis and prevention of diseases and disorders. Learners should research a minimum of two diseases or disorders each, putting together a presentation that can be given to the class. Ensure learners cover species that are susceptible and whether or not the disease is notifiable to APHA.

Learning aim C – Explore livestock health management strategies to prevent and control ill health

Learners will draw upon their knowledge from learning aims A and B throughout learning aim C. They should be actively involved in the routine health assessment and management of livestock, undertaking practical work wherever possible.

- Learners could work in groups to summarise the hygiene procedures that help to prevent the spread of disease, looking at how these might be adapted when working with different livestock species, including their advantages and disadvantages.
- Demonstrate different sterilisation processes and discuss the suitability of each method in different contexts with learners.
- Show learners examples of different treatments that may be given for diseases and disorders. Ask them to identify how these are administered and the conditions for correct administration.
- Tutors can arrange for a local veterinarian to come into the centre to give a master class on the legalities, advantages and disadvantages of medical treatments for diseases and disorders and routine health maintenance.
- Give learners templates demonstrating the various ways to keep records. Allow learners to practise using both manual and computerised records.
- Learners could collate information from the unit, in order to draft plans for the health management of one species of livestock. Give learners guidance and feedback on the key records that need to be kept for events and treatments. Ensure that learners include details on environmental factors, management practices, vaccination schedules and planning for an outbreak of disease.
- Learners could plan and compile evidence for their portfolio.

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

This unit links to:

- Unit 7: Work Experience in the Land-based Sectors
- Unit 10: Farm Livestock Husbandry.

As well as these links, the knowledge, understanding and skills gained in this unit, when combined with the other units within the qualification, will prove invaluable to any learners who wish to embark on an independent business venture, or progress into a managerial position.

Resources

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.

Journals

'*Journal of Animal Health and Production*' (Nexus Academic Publishers) – peer- reviewed papers, articles and reviews on infectious and non-infectious diseases of livestock, poultry and wildlife species. This journal is useful for tutors to keep up-to-date with current research in animal diseases.

'*Livestock Science*' (Elsevier) – peer-reviewed articles on many areas of managing livestock. This journal is useful for tutors to keep up-to-date with current research in identifying and managing disease in livestock.

Websites

'Farm animal health (HWB)' – this website includes some good teaching resources and videos for farm animal health.

'Gov.uk' – search for 'Keeping livestock healthy: disease controls and prevention' for UK government guidance and legislation on managing livestock health, Department for Environment, Food and Rural Affairs (DEFRA). It includes information about the legal responsibilities of livestock producers in managing livestock health, with guidance sections on health management strategies.

'National Animal Disease Information Service (NADIS) – search for 'Disease identification, prevention and control in livestock'. Information on a range of livestock species and diseases, including links to download an app for signs and symptoms of livestock disease with video clips

'National Office for Animal Health (NOAH)' – this is a representative body for the UK animal medicine industry, and the website includes many useful downloadable fact sheets and other resources on the handling and use of veterinary medicines in livestock.

'University of Utah' – search for 'Comparative sizes of microbes'. An interactive scale tool with good illustration for learners to appreciate the differences in size between bacteria, viruses, fungi and parasites

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.