# Epidemiology and Animal Health Economics

## Overview

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## Welcome to the course

Epidemiology and Animal Health Economics is a core course in the Veterinary Epidemiology and Public Health programme and may also be studied as a 240-hour individual module.

The subject areas of basic statistics, veterinary epidemiology and animal health economics are covered in this course. Statistics underpins almost every assessment of cause-effect relationships which is then used to decide on measures to improve livestock productivity, health and welfare.

Statistical methods provide some of the analytical tools that are used during epidemiological investigations. Outbreaks of infectious animal diseases experienced in the UK, such as classical swine fever and foot and mouth disease, as well as the emergence of diseases such as bovine spongiform encephalopathy (BSE or 'mad cow disease') have emphasized the importance of understanding their disease epidemiology in order to be able to deliver control programmes effectively. Decision making, at the farm level in particular but also at the national level, increasingly has to take economic factors into consideration, leading to an increased relevance of the subject area of animal health economics.

This course will provide you with an overview of analytical methods relevant in the context of animal disease control and livestock production. It will give you a basic introduction to statistical analysis, and a fairly comprehensive overview of veterinary epidemiology and animal health economics.

**What will you learn from this course?**

By the end of this course you should be able to:

- conduct basic statistical analyses through the application of parametric and non-parametric methods
- apply relevant descriptive epidemiological measures
- explain the methods used to design and analyse epidemiological studies
- integrate quantitative knowledge of diagnostic test uncertainty into diagnostic decision making
- conduct basic economic analyses of animal health problems at farm level and national project level
- critically review publications addressing cause-effect relationships


**Course structure**

The course consists of 14 units of study, all of which you should complete. They make up the following three modules.

**Module 1: Introduction to Statistics**

In the introductory module (Units 1-3), basic statistical methods will be introduced, starting with descriptive statistics and general probability theory in Unit 1. The next unit covers estimation and hypothesis testing: this will involve the application of methods of statistical inference. The last unit discusses different types of studies and their design considerations, as well as regression analysis and non-parametric techniques.

**Module 2: Introduction to Veterinary Epidemiology**

The second module (Units 4-10) provides an overview of veterinary epidemiology. It begins with an introduction to the principles of epidemiological investigation, followed by descriptive epidemiological measures. Units 6 and 7 discuss the design and analysis of epidemiological studies, and Unit 8 explains a range of concepts relating to interpretation of diagnostic tests. Unit 9 introduces statistical aspects of sampling animal populations, and the module is completed by an overview of animal disease information management.

**Module 3: Introduction to Animal Health Economics**

The third module (Units 11-14) will allow you to explore various economic aspects of animal health and production. Unit 11 provides a general introduction to the main basic economic concepts used in economic analysis, and you will learn about economic tools for decision-making in Units 12 and 13. The last unit focuses on examples of applications of economic analysis at the farm and the project level.

## Tutor-marked assignments

In addition to your work on the 14 units, you are required to complete and submit at least one tutor-marked assignment (TMA) for assessment. If you submit more than one – and you may submit up to two – your best TMA will be used in the calculation of your final mark. Full information on how to approach and submit TMAs is provided in the Programme Handbook and in the assignments themselves. You should bear in mind that your TMA will count for 20% of your final mark for the course.

## Study time

The entire course, including revision and examination, is designed to take approximately 350 hours to complete. This is made up of 15-20 hours' study time for each unit, 10-20 hours for the TMA(s) – so that the units and assignments will require a total of about 240 hours – and the remaining time for personal study and revision. You may find that some units will take you more or less time than estimated, depending on your familiarity with the subject.

## Assessment

Your work for this course will be assessed by means of an unseen written examination paper* which will take the form of essay questions. In addition, you must submit at least one and up to two TMAs.  The grade awarded will be based on the mark obtained in the written examination (80%) and on the mark for the compulsory TMA (20%).

*Since 2020, exams have been held online. Instructions will be communicated prior to the exam's session.