Surveillance and Investigation of Animal Health

Overview

This module will provide in-depth knowledge of qualitative and quantitative risk analysis, animal health surveillance programmes and introduce students to disease modelling.

Subject areas: qualitative and quantitative risk analysis; design and evaluation of animal health surveillance and control programmes involving multiple herds; Farm-level animal disease and production surveillance; Disease modelling using Deterministic and Stochastic modelling.

Software

The below software below will be required to complete your studies:

@Risk: Please note, that to run @Risk on a Mac computer you will need to do so in Windows. Microsoft Office for Mac is not supported. For further information on the Mac requirements please refer to Palisade Knowledge Base available at: https://kb.palisade.com/index.php?pg=kb.page&id=1056.

The fee for the software licence required is valid for one year and is incorporated into the module fee. If studies for the module should extend into a second year, then an additional software fee may be payable.

Microsoft Excel and Microsoft Access: Comprehensive help and resources for Excel and Access are provided in the teaching material to help perform the required activities:

- **Microsoft Excel**: If using a Mac, the Excel layout may look different to a PC version.

- **Microsoft Access**: Additionally, Mac computers do not have the equivalent of Microsoft Access and you will be required to set up your Mac to run as a PC, using appropriate software such as Parallels, Bootcamp* (see below), or similar. For Mac usage, students are recommended to investigate prior to registering for this module, as there may be additional costs incurred.
(*Bootcamp may be used to access any Windows app, including @Risk, or Access: https://support.apple.com/en-gb/guide/bootcamp-assistant/welcome/mac)

Welcome to the course

Surveillance and Investigation of Animal Health is an optional module of the Veterinary Epidemiology and Public Health programme and may also be studied as a 240-hour Individual Module.

The treatment and prevention of problems in animal health and production require an understanding of the impact of risk factors. In addition, it is necessary to monitor disease occurrence and animal productivity using surveillance and monitoring systems. This activity will provide the baseline data about what is normal and will also help in detecting disease outbreaks and the emergence of new diseases. Data can be analysed at different levels of aggregation, from farm to national, or even international level. Farmers will be particularly interested in livestock production performance, as well as disease and welfare, whereas the emphasis for regulatory authorities will usually be disease and welfare. Since any data collection is very costly, it needs to be used strategically, which is where methods such as risk analysis and simulation modelling come in. Owing to the large amounts of information generated by surveillance and monitoring systems, efficient use of these systems requires an understanding of the basic concepts in database design and data manipulation.

This course will provide you with an overview of the different methods suitable for designing surveillance programmes as well as the tools that can be used to assist decision making in relation to control and prevention. During the course, we will cover the topic of risk analysis which has now become a standard component of policy development in animal health. The concepts of disease surveillance at national and farm level will be examined in some detail. The use of computer technology has become an important feature of animal health management: as you work through the course you will have an opportunity to use software packages designed especially for this purpose. Database development and use for simple analyses will be introduced and you will then explore the basic principles of simulation modelling for optimizing disease control strategies.

What will you learn from this course?

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

- describe the methods involved in risk analysis of animal health problems
- explain the components of disease surveillance and control at regional and farm level
- discuss the use of farm-level health and production information systems
- describe selected approaches to database design and data manipulation
- outline how simulation modelling can be used as part of policy development in animal health.

Course structure

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

Module 1: Risk Analysis

In this module (Units 1–3) risk analysis is introduced, with a particular emphasis on its use for trade policy decisions. It begins with a thorough discussion of the generic framework underlying this methodology. Both qualitative and quantitative risk assessment methods are presented in some detail, and models are developed actively using @RISK computer software. An introduction to probability theory is included as it is required in the design of quantitative risk assessment models.

Module 2: Herd Health Surveillance and Management

The second module (Units 4–7) covers various aspects of design and implementation of regional and farm-level production and disease surveillance programmes. It includes the specific requirements for dealing with epidemic, exotic and emerging disease problems. The methods and the necessary infrastructure are discussed, and control strategies for handling disease outbreaks are introduced. This module also provides background on the use of farm-level herd health and production programmes.

Module 3 Introduction to Data Management and Simulation Modelling

The third module (Units 8 and 9) provides an introduction to database design and related methods for more effective manipulation of data collected as part of surveillance or research activities. The basic principles of simulation modelling as a tool in animal health decision making are then introduced.

Tutor-marked assignments

In addition to your work on the nine 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 240-300 hours to complete. This is made up of approximately 20 hours' study time for each unit, 10–20 hours for the TMA(s) 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. There are TMA submission deadlines and for details please refer to the Programme Handbook.

The grade awarded will be based on the mark obtained in the written examination (80%) and on the mark for the compulsory assignment (20%).

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*Since 2020, exams have been held online. Instructions will be communicated prior to the start of the exams session.