

Online Course

AQUACULTURE EPIDEMIOLOGICAL SURVEILLANCE

23 September - 27 October 2021

1. Objective of the course

Epidemiology, understood as the study of the state of health and disease in populations, has great potential for the improvement of aquaculture health management. The term surveillance refers to systematic and continual animal health data collection, comparison and analysis, and timely diffusion of information in order to take appropriate measures. Current legislation requires the application of epidemiology to regulate animal movements and trade, and set up risk-based surveillance systems.

The course will provide participants with extensive comprehension of epidemiological methodologies and principles that they can apply in their professional activity. The course aims specifically to increase participants' knowledge of epidemiology to enable them to work closely and constructively with epidemiologists and understand, interpret and use the results of epidemiological surveys correctly.

At the end of the course participants will be able to:

- Understand the principles of disease causality.
- Investigate an outbreak of disease.
- Identify the transmission route for the propagation of diseases and apply appropriate biosafety measures.
- Interpret the results of diagnostic tests at population level considering sensitivity and specificity.
- Calculate the sample sizes needed to determine absence and prevalence of disease.
- Identify associations between diseases and risk factors.

2. Organization

The course is jointly organized by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), through the Mediterranean Agronomic Institute of Zaragoza (CIHEAM Zaragoza), and the EU H2020 project MedAID (Mediterranean Aquaculture Integrated Development, grant agreement no. 727315), with the collaboration of the University of Zaragoza, through the Faculty of Veterinary Science.

The course will be delivered by lecturers of renowned experience from universities and research centres of different countries. Academic coordination will be carried out by Ana Muniesa, lecturer of the Faculty of Veterinary Science of the University of Zaragoza.

The course will be held online, combining live sessions and individual work with support material. The course will be held over 3 weeks, from 23 September to 27 October 2021. The 7 live sessions lasting between 1 and 2 hours will be held from 15:00h to 17:00h (Central European Time). The total time required to complete the course including individual and practical work will be 64 hours.

English will be the working language of the course. All materials and lectures of the course will be delivered in English. However, the Organization will provide simultaneous interpretation of the live sessions into French and Spanish.

3. Admission

The course is designed for a maximum of 30 participants with a university degree. It is aimed at veterinarians and other professionals in the public and private sectors involved in aquatic animal health, with or without previous formal training in epidemiology.

4. Registration

Candidates must apply online at the following address:
<http://www.admission.iamz.ciheam.org/en/>

Applications must include the curriculum vitae and copy of the supporting documents most related to the subject of the course.

The deadline for the submission of applications is **15 July 2021**. The deadline may be extended if there are free places available.

Applications from those candidates requiring authorization to attend the course may be accepted provisionally.

All participants will be exempt from the payment of registration fees.



5. Teaching organization

The course will require individual work and active participation. The international characteristics of the course favour the exchange of experiences and points of view.

The programme is structured in live sessions and personal work. The live sessions will be used to address doubts on aspects of the programme and to present and resolve practical exercises. They will also include eminently practical topics delivered by guest lecturers of renowned experience in aquaculture health management. Individual work on the topics included in the programme will be based on notes, pre-recorded videos from lecturers, tutorials on practical exercises, recommended reading and other support material.

The practical work will focus on improving participants' skills in applying specific knowledge acquired in each topic.

6. Programme

1. Introduction to epidemiology

- 1.1. History of the beginnings of epidemiology
- 1.2. Definition of epidemiology
- 1.3. Epidemiology applications
- 1.4. Classification of epidemiology
- 1.5. Epidemiological methods
- 1.6. Suggested reading and self-tests

2. Introduction to epidemiological surveillance

- 2.1. Basic concepts and definitions
- 2.2. Classification of epidemiological surveillance systems
- 2.3. New approaches in epidemiological surveillance
- 2.4. Guest lecture: The World Organisation for Animal Health (OIE) and its role in aquaculture health. E. Peeler, CEFAS, UK
- 2.5. Guest lecture: Epidemiological surveillance of salmonid aquaculture in Norway of listed and non-listed diseases. E. Brun, NVI, Norway
- 2.6. Suggested reading and self-tests

3. Study and analysis of the disease

- 3.1. Outbreak investigation
 - 3.1.1. Definitions of outbreak, suspected case, abnormal mortality
 - 3.1.2. Sampling
 - 3.1.3. Diagnosis
 - 3.1.4. Sensitivity, specificity
 - 3.1.5. Suggested reading and self-tests
 - 3.1.6. Tutorials, and introduction to practical exercises
- 3.2. Disease detection
 - 3.2.1. Sampling
 - 3.2.2. Diagnosis

- 3.2.3. Suggested reading and self-tests
- 3.2.4. Tutorials, and introduction to practical exercises
- 3.3. Quantify the disease
 - 3.3.1. Sampling
 - 3.3.2. Parameters to quantify the disease (morbidity, mortality, lethality, apparent prevalence, actual prevalence)
 - 3.3.3. Diagnosis
 - 3.3.4. Suggested reading and self-tests
 - 3.3.5. Tutorials and introduction to practical exercises
- 3.4. Practical work session (topics 3.1; 3.2; 3.3). Computer exercises. Win Epi session. A. Muniesa and I. de Blas, Univ. Zaragoza, Spain
- 3.5. Guest lecture: Bacterial diseases with impact on sea bass and sea bream farming. S. Zrncic, CVI, Croatia
- 3.6. Guest lecture: Viral diseases with impact on Mediterranean fish farming. A. Toffan, IZSve, Italy
- 3.7. Guest lecture: Diagnostic procedures in the case of mortality caused by unknown aetiology. N. Vendramin, DTU Aqua, Denmark

4. Prediction of disease: risk and modelling

- 4.1. Introduction
- 4.2. Risk analysis
 - 4.2.1. Components of risk analysis
 - 4.2.2. Risk qualitative analysis
 - 4.2.3. Risk quantitative analysis
- 4.3. Modelling
 - 4.3.1. Classification of epidemiological models
 - 4.3.2. Phases in the development of an epidemiological model
 - 4.3.3. Types of models (deterministic, probabilistic, mixed)
 - 4.3.4. Computational techniques
- 4.4. Tutorials, examples and practical exercises
- 4.5. Guest lecture: Risk Assessment of VER/VNN Introduction and Spread in Seabass Farms. S. Tavorpanich, NVI, Norway

5. Tools for control and eradication

- 5.1. History of the beginnings of the Health Police
- 5.2. Basis of Preventive Medicine and Health Police
 - 5.2.1. Prevention
 - 5.2.2. Control
 - 5.2.3. Eradication
- 5.3. Suggested reading and self-tests
- 5.4. Guest lecture: Biosecurity in Mediterranean fish farming. A. Le Breton, Vet'Eau, France
- 5.5. Guest lecture: Fish farming Health Defense Groups in Spain. Objectives and surveillance programmes. J. López Ramón, UCH, Spain
- 5.6. Guest lecture: Tools for the evaluation of surveillance systems. B. Basurco, CIHEAM Zaragoza, Spain

GUEST LECTURERS

B. BASURCO, CIHEAM Zaragoza (Spain)
E. BRUN, Norwegian Veterinary Institute, Oslo (Norway)
I. DE BLAS, Univ. Zaragoza (Spain)
A. LE BRETON, Vet'eau, Grenade sur Garonne (France)
J. LÓPEZ RAMÓN, Univ. Cardenal Herrera, Valencia (Spain)
E.J. PEELER, CEFAS Weymouth Laboratory (United Kingdom)

A. MUNIESA, Univ. Zaragoza (Spain)
S. TAVORNPANICH, Norwegian Veterinary Institute, Oslo (Norway)
A. TOFFAN, IZSve, Legnaro (Italy)
N. VENDRAMIN, DTU Aqua, Lyngby (Denmark)
S. ZRNCIC, Croatian Veterinary Institute, Zagreb (Croatia)