



Universitat de Lleida

DEGREE CURRICULUM
**ZOONOSES, PUBLIC HEALTH
AND BIOSAFETY**

Coordination: FRAILE SAUCE, LORENZO JOSE

Academic year 2022-23

Subject's general information

Subject name	ZOONOSES, PUBLIC HEALTH AND BIOSAFETY			
Code	100354			
Semester	ANUAL CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Double bachelor's degree: Bachelor's Degree in Veterinary Medicine and Bachelor's Degree in Science and Production	3	COMPULSORY	Attendance- based
Course number of credits (ECTS)	9			
Type of activity, credits, and groups	Activity type	PRACAMP	PRAULA	TEORIA
	Number of credits	2.2	1.4	5.4
	Number of groups	2	2	1
Coordination	FRAILE SAUCE, LORENZO JOSE			
Department	ANIMAL SCIENCE			
Important information on data processing	Consult this link for more information.			
Language	Language (%): Catalán: 20% Spanish: 60% English: 20%			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
BLANCO PENEDO, MARIA ISABEL	isabel.blancopenedo@udl.cat	2,8	
FRAILE SAUCE, LORENZO JOSE	lorenzo.fraile@udl.cat	9,8	

Subject's extra information

Compulsory subject of the third year of the veterinary degree with a study load of 9 ECTS credits. Students will integrate and apply the knowledge of previously studied subjects such as statistics and pathology and infectious and parasitic diseases for the development of preventive medicine programs applied to each species and livestock production system.

Learning objectives

Students who pass the subject can collaborate in the health policies of farms and livestock companies, especially in aspects related to biosecurity and disease prevention. They can also make assessments of the most frequent infectious and parasitic pathologies, becoming valid interlocutors within the health organization of the company or livestock farm.

Competences

The competencies of this subject will be detailed for the degree in Veterinary Medicine (GVET) and for the degree in Animal Science and Production (GCPA):

BASIC SKILLS

(GVET and GCPA). CB1: Possess and understand knowledge in an area of study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of your field of study

(GVET and GCPA). CB2: Apply their knowledge to their work or vocation in a professional way and possess the competencies that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.

(GVET and GCPA). CB3: Ability to gather and interpret relevant data (usually within their study area) to make judgments that include a reflection on relevant social, scientific or ethical issues

(GVET and GCPA). CB4: Being able to transmit information, ideas, problems and solutions to both a specialized

and non-specialized audience.

(GVET and GCPA). CB5: Know how to develop those learning skills necessary to undertake further studies with a high degree of autonomy

(GCPA). CB9: Use the basic work methodologies referring to the disciplines indicated

(GCPA). CB10: Recognize and know how to apply the basic techniques of livestock experimentation and know how to interpret their results.

GENERAL COMPETENCES

(GVET and GCPA). CG1: Hygiene control, inspection and technology for the production and processing of food for human consumption from primary production to the consumer.

(GVET and GCPA). CG2: Individual or collective prevention, diagnosis and treatment, as well as the fight against animal diseases, be they considered individually or in groups, particularly zoonoses.

(GCPA). CG3: Analyze the strategies of animal production as a whole (facilities, behavior, welfare, nutrition, improvement, production, reproduction, environment, economy, marketing and product quality) with the aim of optimizing production.

(GCPA). CG4: Manage animal production systems with the aim of increasing efficiency (technical, economic, environmental,... ..) and the sustainability of the food chain over time.

(GVET). CG6: Development of professional practice with respect to other health professionals, acquiring skills related to teamwork, the efficient use of resources and quality management.

(GVET). CG7: Identification of emerging risks in all areas of the veterinary profession

SPECIFIC COMPETENCES

(GVET). CE14: Identify and apply the methods and procedures of clinical examination, complementary diagnostic techniques and their interpretation, as well as identify and apply the fundamentals of Necropsy

(GCPA). CE18: Recognize the welfare state of farm animals as a primary factor in production. Describe the different animal diseases, individual and collective, and their prevention measures. Collect and submit samples

(GCPA). CE19: Participate in conducting epidemiological studies and preventive programs in accordance with animal welfare standards, under veterinary supervision. Collaboration in risk analysis, including environmental and biosafety, as well as its assessment and management.

(GVET). CE22. Know the infectious and parasitic diseases of veterinary interest, including their diagnosis and fight, as well as applying the bases of Zoonosis and Public Health.

(GVET). CE23. Identify technical measures and regulations for the prevention, control and eradication of animal diseases, know the methods of health promotion in animal groups, including wild animals, in order to obtain the maximum economic performance in a social way, ethically and healthily acceptable.

(GVET). CE46. Assess and interpret the productive and health parameters of an animal group, considering the economic and welfare aspects

TRANSVERSAL COMPETENCES

(GVET and GCPA). CT1: Acquire an adequate oral and written comprehension and expression of Catalan and Spanish

(GVET and GCPA). CT2: Acquire a significant command of a foreign language, especially English

(GVET and GCPA). CT3: Acquire training in the use of new technologies and information and communication technologies

(GVET and GCPA). CT4: Acquire basic knowledge of entrepreneurship and professional environments

(GVET and GCPA). CT5: Acquire essential notions of scientific thought

(GCPA). CT6: Analyze specific situations, define problems, make decisions and implement action plans in search of solutions.

(GCPA). CT7: Apply acquired knowledge to real situations

Subject contents

Block 1.- INTRODUCTION

Unit 1.-

Epidemiology. Concept. Historical development. Descriptive and analytical epidemiology. Objectives and working methods.

Unit 2.-

Cause concept. Historical evolution. Models of causality. Criteria of causality.

Unit 3.-

Determinants of the disease associated with the host, the causative agent and the environment.

Unit 4.-

Transmission and maintenance of infections in the population.

Block 2.- DESCRIPTIVE EPIDEMIOLOGY

Unit 5 (1) .-

Forms of disease presentation: epidemic, endemic, pandemic and sporadic disease. Epidemic curves.

Unit 5 (2) .-

Trends in the temporal distribution of the disease and its detection: Time series analysis.

Unit 6.-

Ways to measure the disease. Morbidity measures: prevalence and incidence. Relationships between prevalence and incidence. Mortality measures. Gross and specific rates and ratios.

Unit 7.-

Sampling. Population and sample. Types of sampling. Sample size. Calculation of the sample size to detect a disease in a population and to determine the prevalence.

Unit 8.-

Diagnostic criteria. Errors associated with the application of diagnostic tests. Assessment of diagnostic tests. Sensitivity and specificity. Relationships between sensitivity and specificity. Application of diagnostic tests. Positive and negative predictive values. Concordance between diagnostic tests.

Unit 9.-

Epidemiological data. Data types and measurement scales. Selection of variables. Epidemiological data sources. Data Collect. Questionnaires: structure, elaboration and validation. Most frequent variables in epidemiological studies.

Block 3.- ANALYTICAL EPIDEMIOLOGY

Topic 10 (1) .-

Analytical epidemiology. Goals. Types of epidemiological studies. Classifications. Causal inference in observational studies.

Topic 10 (2) .-

Observational studies. Cohort studies. Case-control studies. Goals. Design. Experimental studies.

Unit 11.-

Clinical trials. Field tests. Goals. Design.

Unit 12.-

Epidemiological measures of association. Measures of magnitude: relative risk, odd ratio and prevalence ratio. Impact measures: Attributable risk and attributable fraction. Population measures.

Unit 13.-

Multiple data analysis in observational studies. Confusion: concept. Risk estimation in the presence of confusion. Interaction: concept. Risk estimation in the presence of interaction.

Block 4.- SANITARY POLICE AND BIOSECURITY

Unit 14.-

Organization and structure of animal health.

Unit 15.-

Control of animal movement. Identification and registration of farms. The quarantine.

Unit 16.-

Epidemiological surveillance. Surveillance systems.

Unit 17.-

Control and eradication of diseases.

Unit 18.-

Epidemiological surveillance networks

Unit 19.-

Introduction to risk analysis. Risk management and communication. Risk in imports.

Unit 20.-

Biosecurity measures on farms.

Unit 21.-

Hygiene and disinfection. Other prevention, control and eradication measures.

Topic 22 (I and II) .-

Immunizations and mass treatments.

Block 5.- PREVENTIVE MEDICINE PROGRAMS

Topic 23 (I and II) .-

Economics of disease. General concepts and interest. Evaluation of the economic cost of the disease. Cost-benefit analysis of disease control.

Topic 24 (I and II) .-

Preventive medicine programs in swine production. Production systems and their impact on health. Production objectives and parameters as indicators of health.

Unit 25.-

Preventive medicine programs in swine production. Programs in breeding females. Reproductive efficiency.

Topic 26 (I and II) .-

Preventive medicine programs in swine production. Programs in growing animals.

Unit 27.-

Fattening calf preventive medicine programs. Management in intensive and extensive systems.

Topic 28 (I and II) .-

Preventive medicine programs in dairy cattle. Reproduction, peripartum and health control of neonates.

Unit 29.-

Preventive medicine programs in dairy cattle. Milking sanitary management and mastitis control.

Topic 30.-

Antiparasitic control in large ruminants

Topic 31 (I and II) .-

Preventive medicine programs in poultry. General concepts. Vaccination as a fundamental tool.

Unit 32.-

Preventive medicine programs in poultry. Specific programs.

Unit 33.-

Preventive medicine programs in small ruminants. Production systems and their impact on health. Production objectives and parameters as indicators of health.

Unit 34.-

Preventive medicine programs in small ruminants. Adult animal.

Unit 35.-

Antiparasitic control in small ruminants.

Unit 36.-

Preventive medicine programs in small ruminants. Animal during the first ages.

Unit 37.-

Preventive medicine programs in small ruminants. Animal during bait.

Topic 38.-

Preventive medicine programs in rabbit farming.

Unit 39.-

Aquaculture preventive medicine programs.

Practical classes:

Practice 1.-

The Win Epi program applied to the sample size calculation. Resolution of practical cases .--- 2 hours

Practice 2.-

The Win Epi program applied to the evaluation of diagnostic tests. Resolution of practical cases .--- 2 hours

Practice 3.-

Epidemiological data analysis (I) --- 2 hours

Practice 4.-

Epidemiological data analysis (II) --- 2 hours

Seminar 1.-

Practical case of preventive medicine in pigs. 2 hours

Seminar 2.-

Practical case of preventive medicine in birds. 2 hours

Seminar 3.-

Preventive medicine case study in calves. 2 hours

Methodology

Teaching is structured in theory and practice with an approximate relationship between them of 2.5: 1. The expected duration of the theoretical class is 50 minutes according to the ETSEA class schedules.

The practices will be carried out both in person and not in person with tutoring.

Due to the health situation of the COVID19 pandemic, teaching can be done in person, in person, or virtually. The teacher has the methodology adapted to each of these possibilities. Whenever possible, the evaluation will be in person.

Development plan

The detailed calendar by weeks will be published on the virtual campus and on the ETSEA website so that students can organize themselves more efficiently.

Evaluation

Activity	Goals	Observations	Score weight (%)
Exams	Evaluation of general competences of the subject	Three exams will be carried out following the official calendar of the UdL.	70%

Epidemiological study solution	Evaluation of specific competences of the subject	During the academic year but more focused on the last semester.	20 %
Evaluation of the epidemiological survey	Evaluation of specific competences of the subject	During the academic year but more focused on the last semester.	10%
Total			100%

The evaluation is continuous. There will be three theoretical exams throughout the course coinciding with the scheduled evaluation weeks.

20% of the grade will be determined by the delivery of a work at the end of the course that will be carried out in groups of 2 people on a practical case that will be agreed with the teacher on its selection and by the evaluation of an epidemiological survey (10%) which will also be done between two people.

The rubrics for the evaluation process of the epidemiological survey and the practical case will be available on the virtual campus so that students can consult them.

Bibliography

Textbooks represent the basic bibliography to be used by a student taking the subject of zoonosis, public health and biosecurity in the veterinary degree. The books will be available in the library for your consultation. Below is a list of recommended textbooks that, to a greater or lesser degree, have been used in the development of this program:

Blocks 1, 2 and 3:

1. Thrusfield, M. 1995. *Veterinary epidemiology*. 2nd ed. Blackwell Science Ltd, Oxford.

Thrusfield, M. 1990. *Epidemiología veterinaria*. Editorial Acribia, Zaragoza. (Edición traducida al español de la primera edición en inglés de 1986).

2. Martin, S. W., A.H. Meek, y P. Willeberg, P. 1987. *Veterinary epidemiology. Principles and methods*. Iowa State University Press, Ames, Iowa.

Martin, S. W.; Meek A. H., Willeberg P. 1997. *Epidemiología veterinaria : principios y métodos*. Editorial Acribia, Zaragoza. (Edición traducida al español).

3. Noordhuizen, J. P. T. M., K. Frankena, C. M. van der Hoofd, y E. A. M. Graat. 1997. *Application of quantitative methods in veterinary epidemiology*. Wageningen Pers, Wageningen.

4. Casal, J., E. Mateu de Antonio. 1999. *Problemas de Epidemiología Veterinaria*. Servicio de Publicaciones de la Universidad Autónoma de Barcelona, Bellaterra.

5. Pfeiffer, D. U. 1999. *Veterinary epidemiology - An introduction*. <http://www.rvc.ac.uk/epibook> .

6. Petrie, A., P. Watson. 1999. *Statistics for Veterinary and Animal Science*. Blackwell Science Ltd. Oxford.

Blocks 4 and 5:

1. Radostis, OM (2001). Herd health. Food animal production medicine. 3^o edition. Saunders company.
2. Toma B, Dufour, B, Sanaa, M, Benet, JJ, Ellis P, Motou, FY, Louza A. (1999). Applied veterinary epidemiology and the control of disease in populations. AEEMA.
3. Dufour B, Hendrixx, P (2009). Epidemiological surveillance in animal health. 2^o edition OIE.
4. Muirhead, MR, Alexander TJ (2001). Manejo sanitario y tratamiento de las enfermedades del cerdo. Referencias para la granja. Intermédica.
5. Brand, A. Noordhuizen, JPTM, Schukken, YH (1996). Herd health and production management in dairy practice. Wageningen press.

Web pages of interest:

<http://www.cdc.gov>

<http://www.rvc.ac.uk/epivetnet/>

<http://www.oie.int>

<http://www.who.int>

<http://www.mapa.es/es/ganaderia/ganaderia.htm>

<http://www.sanidadanimal.info>