27136 - Veterinary Biotechnology

Información del Plan Docente

Academic Year	2017/18
Faculty / School	100 - Facultad de Ciencias
Degree	446 - Degree in Biotechnology
ECTS	6.0
Year	4
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

For students enrolled in the subject, places, times and dates of lectures and practical sessions will be public via Bulletin Board advertisements of the grade on the platform Moodle at the University of Zaragoza, https://moodle2.unizar.es/add/, and in the moodle page for the course. These routes will be also used to communicate enrolled students their distribution by groups of practical sessions, which will be organized by the coordination of degree.

Provisional dates will be available on the website of the Faculty of Sciences in the corresponding section of the Degree in Biotechnology: https://ciencias.unizar.es/grado-en-biotecnologia.

In this web there will be also available the dates of exams.

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

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3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

5.2.Learning tasks

5.3.Syllabus

Part I. Technological aspects of animal welfare.

-Animal Welfare: Concepts and different views. Ethical and regulatory aspects. Environmental effects on animals that involve poor welfare. The value of preference tests in relation to welfare. Stress and well-being: general adaptation or stress syndrome. Welfare measurement: physiological and behavioural indicators.

-The effects of production efficiency on animal welfare. Relationships between disease, production rates and animal welfare. Problems arising from intensive production systems. Farm animal welfare and intensive production systems. Welfare of animals during transport. Effects of stress on meat quality.

-New markers of disease, immunological stress and animal welfare. Acute phase proteins (APP): definition, types, APP according to species. Response in experimental models: inflammation, infection, stress during transport, other. Method for measurement of APP. Validation and standardization of APP assays.

-Effect of animal welfare in the production and quality of products of animal origin. Applications of the APP measurements in farm animals and pets.

Part II. Genetic biotechnology for improving animal production and health.

-Genetic variation applied to animal identification: most commonly used molecular markers.

-Genetic identification in domestic animals: paternity testing; studbooks control; effectiveness of improvement plans; traceability; breeds and species identification.

-Genes of interest in animal production: improvement of animal products.

-Resistance and genetic susceptibility to diseases of livestock interest: Scrapie ovine, porcine stress syndrome, BLAD ...

-Identification and characterization of microbial species using genetic markers (16S rRNA, MLST) and genomic analysis (NGS).

- *In vitro* models for the study of animal diseases.

-New therapies in animals. Stem cells. Cell therapy in domestic animals.

Part III - Biotechnological aspects of diagnosis and prevention of animal diseases.

-Biotechnology applied to optimize diagnostic tools in animal health. Increase of sensitivity and specificity of current diagnostic methods.

-Biotechnology applied to the improvement of diagnosis of zoonosis and detection of foodborne pathogens.

-Vaccine development through biotechnology applied to animal health. Specifications of the vaccines for reducing the risk of virulence reversion and the interference with passive immunization.

-Stimulation of the growth of immune system to prevent infectious diseases in domestic animals.

-Search for biomarkers and/or antigens that may be directly or indirectly employed to improve animal disease control strategies.

-Markers of apoptosis and programmed cell death.

Learning activities 2 and 3

-Determination of animal welfare by quantitative measurement of acute phase proteins.
-Application of biotechnology to diagnosis of animal diseases.
-Application of biotechnology to diagnosis of zoonoses and foodborne pathogens.
-Vaccine manufacturing procedures using biotechnological systems.
-Management of a laboratory of high biosafety level.
-Clinical applications of mesenchymal stem cells in animal species.

5.4.Course planning and calendar

Schedules of lectures and problems will coincide with the officially established and will be available at: https://ciencias.unizar.es/grado-en-biotecnologia.

The places, calendar and groups for training and practical sessions will be established in coordination with the rest of maters at beginning of course. The Coordinator will produce the groups of students for these activities at beginning of course to avoid overlaps with other subjects.

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5.5.Bibliography and recommended resources