Master's Degree
Ruminant Medicine and Surgery

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Master's Degree
Ruminant Medicine and Surgery

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/veterinary-medicine/master-degree/master-ruminant-medicine-surgery**

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01

Introduction

When talking about veterinary medicine and surgery, we usually think about animals as individuals, however, when talking about production animals, it is essential to think of the herd as one. For this reason, this program is designed to specialize professionals in individual medicine and surgery as well as in herd health, through preventive measures, diagnosis, reproductive efficiency, management or assessment of production costs.

With this in mind, this program in Ruminant Medicine and Surgery addresses clinical skills, management, animal production and anatomopathological diagnosis as a fundamental aspect in the detection of herd diseases. It is a different approach that will allow the student to intervene in this area as an expert.

You will learn about all the existing methods useful for the treatment of ruminant pathologies from professionals with years of experience in the sector"

Due to the enormous amount of knowledge that is continually being produced, it is difficult for clinicians to constantly keep their knowledge up to date. Therefore, this program provides the best and most up-to-date evidence-based information to enable the Ruminant Veterinarian to not only solve day-to-day problems, but also to advise on management, animal welfare and productivity improvement.

The Master's Degree in Ruminant Medicine and Surgery facilitates the ongoing specialization of clinical veterinarians, whose busy daily activity makes it impossible for them to attend face-to-face training. It deals with the medicine and surgery of the individual animal in depth, a fact that is often surpassed by the importance of the herd in animal production.

Ruminant clinicians must have specialized knowledge and skills in order to solve individual problems or offer advice without forgetting the importance of the herd. They must be able to plan an adequate system of disease management and prevention, and reduction of animal production costs.

Although this Master's Degree places emphasis on the development of clinical skills, reproduction and notions of animal production, Animal Medicine and Surgery of the individual is also highly relevant. This is because, despite the fact that the economic importance of the herd is fundamental, postgraduate specialization programs in herd health issues in animal production are very common, but specialist courses in ruminant medicine and surgery are scarce.

This **Master's Degree in Ruminant Medicine and Surgery** contains the most complete and up-to-date educational program on the market. The most important features of the program include:

- The latest technology in online teaching software
- A highly visual teaching system, supported by graphic and schematic contents that are easy to assimilate and understand
- The development of practical cases presented by experts
- State-of-the-art interactive video systems
- Teaching supported by telepractice
- Continuous updating and recycling systems
- Autonomous learning: full compatibility with other occupations
- Practical exercises for self-evaluation and learning verification
- Support groups and educational synergies: questions to the expert, debate and knowledge forums
- Communication with the teacher and individual reflection work
- Content that is accessible from any fixed or portable device with an Internet connection
- Complementary documentation databases that are permanently available, even after the program

An essential and yet unique syllabus, created for veterinary clinicians that will set you apart as a specialist in this field of work"

With a methodological design that relies on proven teaching techniques, this innovative program will take you through different teaching approaches to allow you to learn in a dynamic and effective way"

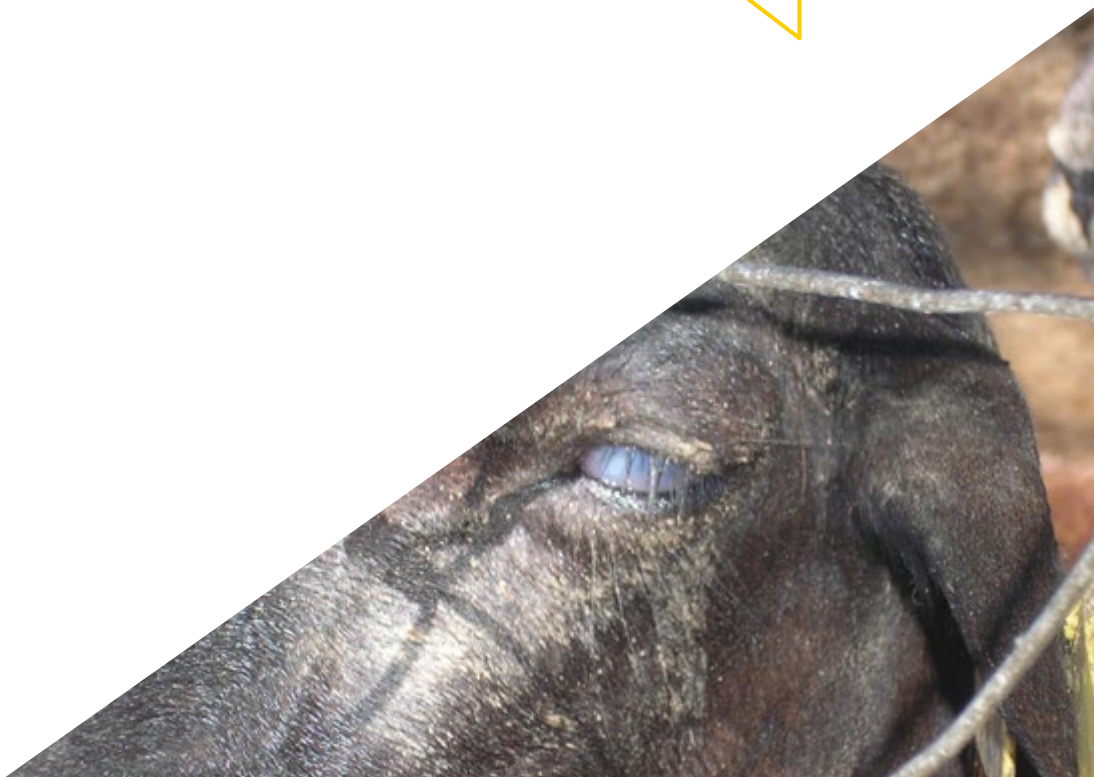
Our teaching staff is made up of professionals from different fields related to this specialty. In this way, TECH makes sure to offer professionals the up-to-date objective it intends. A multidisciplinary team of professionals who are trained and experienced in different environments will develop theoretical knowledge efficiently, but, above all, will provide students with practical knowledge derived from their teaching experience: one of the differential qualities of this program.

The efficiency of the methodological design of this Master's Degree, enhances the student's understanding of the subject. Developed by a multidisciplinary team of e-Learning experts, it integrates the latest advances in educational technology. In this way, the student will be able to study with comfortable and versatile multimedia tools that will give them the operability they need in their training.

This program is designed around Problem-Based Learning: an approach that conceives learning as a highly practical process. To achieve this remotely we will use online learning. With the help of an innovative system of interactive videos and Learning from an Expert, you will be able to acquire the knowledge as if you were truly facing the case you are learning about at that moment. A concept that will make it possible to integrate learning in a more realistic and permanent way.

With the experience of working professionals and the analysis of real success stories, in a high-impact academic program

Supported by evidence, the approach of this program will allow you to learn in a contextual way and acquire the skills you will really need in your daily practice



02

Objectives

Completing this program provides the veterinary professional with specialized and advanced clinical knowledge, based on evidence, enabling them to successfully carry out their daily clinical practice.

In addition to the up-to-date approach concerning the problems encountered on a daily basis, the bibliography provided and the structure of the topics will allow you to keep your knowledge up to date.

The Master's Degree in Ruminant Medicine and Surgery will allow the veterinary clinician to update and broaden their knowledge and skills in Ruminant Medicine and Surgery"

General Objectives

- Determine the methods of physical and chemical containment for the development of the clinical activity
- Examine the different methods of diagnostics and research within the herd
- Specify the existing treatments useful for the treatment of ruminant pathologies
- Analyze the importance of analgesia in ruminants, the basis of animal welfare and the management of diseases that usually cause pain in ruminants
- Establish the economic and health impact of pain in animals and its impact on production
- Generate specialized knowledge on identification and treatment procedures specific to ruminants, in order to reduce, treat or avoid pain in our veterinary management
- Develop the main analgesic techniques and procedures applied in ruminants
- Obtain productive yields in beef and dairy cattle in an economically viable manner and in a context of production sustainability
- Manage animal feeding as an element for the technical-economic optimization of milk production in cattle, respecting animal welfare and minimizing environmental impact
- Advise and manage, technically and economically, the reproductive plans of small ruminant farms
- Manage a farm animal population from a genetic point of view and initiate or complete their specialization in notions of genetic improvement and selection
- Analyze the physiological functioning of all those parts or organic systems of ruminants that, directly or indirectly, participate in the reproductive function, both in the female and in the male, as well as the disorders related to them
- Determine the biotechnology techniques applicable in the field of animal reproduction to improve, productively and/or economically, the reproductive performance of ruminants
- Examine the reproductive phenomena that are necessary gestation and their diagnosis
- Develop the reproductive phenomena that occur before, during and after childbirth, as well as those situations of obstetric applicability
- Generate specialized knowledge on gestation in cattle from its beginning
- Establish the most important phases and events from a practical point of view
- Determine the critical points of gestation and their detection
- Analyze the techniques for pregnancy diagnosis in cattle by palpation, ultrasound and other techniques
- Determine fetal viability and embryo sexing
- Analyze the different methods of diagnosis and treatment of the different pathological conditions directly related to the reproductive function in ruminants
- Examine the mechanics of euthyroid delivery in cows
- Address the causes of dystocia and determine the techniques and methods of resolving dystocia in cattle
- Establish an appropriate methodology for the screening of ruminants with cardiovascular, respiratory and hemolymphatic problems
- Identify all clinical signs associated with cardiovascular, respiratory and hemolymphatic diseases in ruminants
- Address the main cardiovascular, respiratory and hemolymphatic pathologies affecting ruminants, their diagnosis and treatment
- Develop specialized knowledge on the most common gastrointestinal problems in ruminants
- Specify all clinical signs associated with each gastrointestinal disease
- Analyze the specific clinical approach to each gastrointestinal pathology
- Determine the prognosis and the most appropriate treatment in each case
- Examine the physiological functioning of the urinary system
- Establish an appropriate methodology for examination of the patient with urinary and renal problems
- Identify all clinical signs associated with kidney disease
- Establish the specific clinical approach to patients with renal disorders

- Provide specialized knowledge of the most common neurological problems in ruminants
- Identify all clinical signs associated with each neurological disease
- Establish the specific clinical approach for each pathology
- Determine the prognosis and the most appropriate treatment in each case
- Address the main ocular pathologies affecting ruminants, their diagnosis and treatment
- Determine the importance of ocular diseases in ruminants
- Analyze the economic and health impact of diseases with ocular signs
- Develop screening procedures and specific treatments for ruminants that differ from other species
- Examine the main diseases and their specific treatment
- Generate specialized knowledge of the most frequent dermatological problems in cattle and small ruminants
- Identify all clinical signs associated with each dermatological disease
- Establish the specific clinical approach for each pathology and determine the prognosis and the most appropriate treatment for each skin disease
- Determine the importance of endocrine pathologies in ruminants and their relationship with metabolic diseases of the puerperium
- Generate specialized knowledge on the main metabolic processes in cattle and small ruminants
- Examine the clinical approach to the different infectious and parasitic diseases in ruminants
- Compile the complementary methods available to diagnose the main infectious and parasitic pathologies
- Determine the general and specific treatment of the main infectious and parasitic pathologies
- Generate advanced knowledge on the prevention of the main infectious and parasitic diseases
- Review surgical principles and adapt them to ruminant surgery
- Determine the main surgical conditions affecting soft tissues in ruminants
- Be able to make the decision to plan a surgical intervention
- Analyze the fundamental surgical techniques
- Address perioperative complications
- Generate specialized knowledge to take the necessary measures to prevent such complications
- Establish how to search for complementary information on soft tissue surgery in ruminants
- Determine the importance and impact of lameness in ruminants
- Examine how to diagnose lameness
- Develop the main conditions of the musculoskeletal system in ruminants
- Generate specialized knowledge to make the decision to indicate a surgical intervention
- Establish the fundamental surgical techniques in ruminant traumatology and orthopedics
- Analyze perioperative complications and take the necessary measures to prevent such complications
- Know how to search for complementary information on ruminant traumatology and orthopedics

Specific Objectives

Module 1. Clinical Skills

- Compile the methods of containment in bovine animals
- Determine the basic material for a ruminant clinical veterinarian
- Identify problems at the collective level
- Establish the basis of diagnosis and know the special diagnostics in ruminant medicine
- Specify antimicrobial therapies by means of laboratory studies
- Analyze fluid therapy as a daily work tool
- Demonstrate the different analgesic therapies in ruminants
- Propose different anesthetic and sedation protocols at systemic and local level
- Review particular analgesia and sedation protocols in ruminants
- Diagnose the main pathologies that cause pain and the techniques or drugs necessary for their treatment
- Enable the student to establish the pharmacological therapeutic treatments or specific techniques in exploratory and/or surgical procedures necessary for each pathology

Module 2. Animal Production and Anatomopathological Diagnosis

- Adequately interpret dairy cattle production parameters and assess new management and adaptation models in the face of a climate change scenario
- Ensure optimal management of beef cattle farms within the framework of sustainability and animal welfare
- Advise and manage, technically and economically, the reproductive plans of small ruminant farms
- Assess and interpret production parameters in a small ruminant farm, considering economic and welfare aspects
- Design action protocols and technologies to optimize small ruminant farms, whether for dairy or meat production
- Analyze the feeding of dairy cows in a sustainable environment while maintaining production objectives, using, as much as possible, grazing resources
- Manage the feeding of maternal beef cows in a sustainable environment, maintaining production objectives and using, as much as possible, grazing resources
- Optimize the fattening process through the use of by-products
- Examine the feeding of herds in a sustainable environment while maintaining production objectives, using, as much as possible, grazing resources, optimizing the lamb fattening process through feeding strategies
- Establish the concepts of consanguinity and kinship. Estimate these parameters in a domestic cattle population as a basis for a correct genealogical management of the population
- Estimate the fundamental genetic parameters of a population: Repeatability and heritability, as a basis for a correct approach to genetic improvement
- Use the methodologies required for genetic improvement through selection

Module 3. Reproduction

- Determine the characteristics and pathologies of the estrous cycle in ruminants
- Establish cycle control techniques to optimize production based on reproduction
- Identify the possible alterations that the reproductive system may suffer in both males and females, in order to diagnose and treat them
- Recognize the most frequent miscarriages in ruminants and the main causes that can lead to them
- Develop the best method of labor management once the different stages of labor have been identified
- Examine the phases involved in the physiological puerperium of ruminants

- Address the pathologies that can be established in a pathological puerperium
- Examine the physiology of lactation and diagnose the main pathologies of the mammary gland
- Determine the reproductive biotechnologies to be applied according to the type of livestock farm
- Perform gestational diagnosis, diagnosis of fetal pathology and embryo sexing gestation
- Determine how to diagnose and treat dystocia, resolve uterine torsion, consider and perform cesarean section
- Generate specialized knowledge on how to plan and perform a fetotomy

Module 4. Cardiovascular, Respiratory and Hemolymphatic Diseases in Ruminants

- Learn how to perform a complete physical examination of the cardiovascular, respiratory and hemolymphatic systems
- Understand the diagnostic procedures used in suspected cardiovascular, respiratory and hemolymphatic pathology, and the interpretation of their results
- Accurately recognize the clinical signs of pathologies of the cardiovascular, respiratory (upper or lower respiratory tract) and hemolymphatic systems
- Determine the main causes of disease of the cardiovascular, respiratory and hemolymphatic systems in cattle, sheep and goats
- Examine the necessary and triggering factors of traumatic reticulopericarditis and Bovine Respiratory Syndrome (BRS)
- Identify the main pathogens involved in the development of BRS and know their relative importance within the complex
- Determine the epidemiology and clinical significance of bovine leukosis and anemia in small ruminants

Module 5. Ruminant Gastrointestinal and Urinary Tract Diseases

- Recognize the clinical signs of the main pathologies affecting the gastrointestinal system of ruminants
- Develop knowledge of the main gastrointestinal pathologies affecting bovines
- Examine the typical signs of diseases affecting the oral cavity of cattle and their possible differential diagnoses
- Analyze the mechanisms of the different causes of indigestion in cattle
- Establish action protocols for cattle suffering from abomasal displacement
- Identify clinical signs and therapeutic options for the main causes of intestinal obstruction in cattle
- Specify the diagnosis of diarrhea in cattle
- Establish treatment protocols for cattle with diarrhea
- Develop the main gastrointestinal pathologies affecting small ruminants
- Generate specialized knowledge to perform a clinical examination of a patient with urinary and renal problems
- Identify the alterations inherent to the different renal diseases
- Establish an appropriate diagnostic plan for the main clinical manifestations of renal problems
- Correctly diagnose the different renal problems and issue a prognosis for these animals
- Determine a treatment plan, both short and long term, for major urinary and renal problems

Module 6. Neurological and Ophthalmological Diseases

- Specify the information needed in the clinical examination of the neurological patient
- Be able to perform a neurological examination in bovines and small ruminants
- Localize lesions in a patient with a neurological disorder
- Identify the main pathologies affecting the bovine brain, brainstem, cerebellum and spinal cord
- Develop the main alterations affecting peripheral nerves in cattle
- Study the main nervous pathologies affecting small ruminants
- Examine the particular examination protocols in ophthalmology in ruminants
- Enable the student to diagnose the main ocular pathologies and their relationship with other diseases
- Determine the necessary therapeutic and/or surgical treatments for each pathology
- Establish management measures and treatment protocols for the main neurological pathologies affecting cattle and small ruminants
- Develop knowledge of the main ocular pathologies affecting bovines
- Develop knowledge of the main ocular pathologies affecting sheep and goats

Module 7. Metabolic, Endocrine and Dermatological Diseases in Ruminants Toxicology and Neonatology

- Identify the main pathologies affecting the skin of rumiants
- Analyze the origin of the problem and establish the prognosis of dermatitis
- Recognize the clinical and laboratory signs of the main dermatological diseases
- Determine the symptoms of skin diseases of infectious origin (viral, bacterial, fungal and parasitic) and propose therapeutic options
- Establish the symptoms of cutaneous and mucocutaneous diseases, propose therapeutic and management options, and determine if it is a reportable disease
- Recognize the main cutaneous neoplasms in cattle and small ruminants, propose appropriate treatment and determine the prognosis

- Identify the clinical signs of metabolic diseases and understand the associated endocrinopathies, their prognosis, treatment options and prevention
- Specify the diagnostic procedures used in endocrinology and their interpretation
- Recognize the main manifestations of the most common nutritional problems in cattle and small ruminants
- Establish management strategies to correct nutritional problems in a production system and to treat affected individuals
- Recognize the clinical manifestations of the main causes of poisoning in cattle and small ruminants
- Establish an appropriate treatment plan for animals with exposure to toxic agents

Module 8. Infectious and Parasitic Diseases in Ruminants

- Identify the main infectious diseases affecting ruminants
- Establish the differential diagnosis of the clinical signs of the main infectious and contagious pathologies in ruminants
- Propose a work methodology for patients with infectious and contagious disorders
- Provide specialized knowledge to treat and prevent the main infectious and contagious pathologies in ruminants
- Understand and identify the different realities and challenges faced by ruminants according to the type of production system in which they are involved
- Be able to identify the technical differences, advantages and disadvantages of vaccines available on the market
- Be able to, depending on the infectious challenge faced by ruminants, develop an effective, efficient and economically justifiable vaccination plan adapted to the reality of each farm
- Identify the clinical signs of parasitic diseases affecting ruminants
- Specify the diagnostic procedures used in parasitology and their interpretation
- Determine a theoretical-practical methodology for the patient with parasitic diseases
- Provide specialized knowledge to establish programs for the control and management of parasites in ruminants

Module 9. Soft Tissue Surgery

- Examine, substantiate and develop prognosis of surgical techniques related to common ruminant wounding, dehorning and eye surgery
- Analyze prognosis of surgical techniques related to umbilicus, foreskin, penis and scrotum surgery
- Generate specialized knowledge on surgical techniques related to urinary tract surgery

Module 10. Musculoskeletal System Surgery

- Establish the anatomy and biomechanics of the hoof, as well as its functional trimming
- Generate specialized knowledge in order to establish a differential diagnosis of hoof pathologies, their treatment and prognosis
- Diagnose septic processes of the distal limb and know their therapeutic options
- Determine the diagnosis of lameness in ruminants
- Describe, substantiate and define prognosis of surgical techniques related to cranial cruciate ligament rupture, superior patella fixation, coxofemoral dislocation and fracture of the femoral neck of the ruminant
- Examine joint pathologies and establish the therapeutic options and their prognosis
- Analyze tendon injuries and establish the therapeutic options and their prognosis
- Describe, substantiate and define prognosis of surgical techniques related to the resolution of specific fractures with external coaptation and/or open reduction and internal fixation of the ruminant

03

Skills

This Master's Degree in Ruminant Medicine and Surgery has been created as a high-skilled training for veterinary professionals. Its intensive specialization will enable the student to work in all fields related to this area with the confidence of an expert in the field.

The Master's Degree in Ruminant Medicine and Surgery will provide you with the personal and professional skills necessary to play an appropriate role in any professional situation in this field of intervention"

General Skills

- Possess the fundamental clinical knowledge required for daily practice in cattle and ruminants
- Access the necessary bibliography to keep up to date with the latest developments
- Use the most advanced and up-to-date veterinary methods in ruminant intervention
- Recognize the principles of evidence-based veterinary medicine
- Gain knowledge of the theoretical aspects of specialization in Ruminant Medicine and Surgery with a specific focus on the herd as a group

Take the step to get up to date on the most relevant aspects of Ruminant Medicine and Surgery"

Specific Skills

- Utilize ruminant clinic skills
- Optimize animal production criteria in ruminants
- Intervene in the different reproductive contexts of ruminants
- Detect and treat cardiovascular disease in ruminants
- Detect and treat respiratory diseases in ruminants
- Detect and treat hemolymphatic disease in ruminants
- Detect and treat diseases of the gastrointestinal tract in ruminants
- Detect and treat urinary diseases in ruminants
- Detect and treat neurological diseases in ruminants
- Detect and treat ophthalmologic diseases in ruminants
- Detect and treat metabolic diseases in ruminants
- Detect and treat endocrine diseases in ruminants
- Detect and treat dermatological diseases in ruminants
- Intervene in toxicology
- Intervene in neonatology
- Detect and treat infectious diseases in ruminants
- Detect and treat parasitic diseases in ruminants
- Perform soft tissue surgery
- Perform surgery of the musculoskeletal system

04

Course Management

Within the concept of total quality of our program, TECH is proud to provide students with a teaching staff of the highest level, chosen for their proven experience. Professionals from different areas and fields of expertise that make up a complete, multidisciplinary team. A unique opportunity to learn from the best.

An impressive teaching staff, made up of professionals of the highest level, will be the professors throughout the program, providing the most real, close and current learning experience"

Management

Dr. Ezquerra Calvo, Luis Javier

- PhD in Veterinary Medicine from the University of Extremadura
- Degree in Veterinary Medicine from the University of Zaragoza
- Specialist in Applied and Experimental Animal Surgery, University of Zaragoza
- Specialist in Animal Reproduction and Artificial Insemination, University of Zaragoza
- Diploma from the European College of Veterinary Surgeons in Large Animals
- Presents 6 five-year teacher evaluation periods

Professors

Dr. Acín Tresaco, Cristina

- PhD in Veterinary Medicine from the University of Zaragoza and Extraordinary Doctorate Award from the same university
- Degree in Veterinary Medicine from the University of Zaragoza. Diploma of Advanced Studies
- Teacher in different graduate and postgraduate courses, university specialization programs and master's degree, and coordinates different subjects
- She actively participates as director of master's degrees, doctoral theses and final projects in the Veterinary Degree and as external expert evaluator and member of the tribunal of different doctoral theses
- She is a reviewer of scientific articles in more than 15 journals indexed in the Journal Citation Report (JCR)
- Three six-year periods of recognized research (CNEAI) and is accredited as a Professor Hired Doctor, Professor of Private University and Full Professor by ANECA

Dr. Barba Recreo, Martha

- Veterinary Outpatient Equine Clinic, Gres-Hippo, St. Vincent de Mercuze, France
- Professor, researcher and clinical veterinarian in the Equine Internal Medicine Service, Faculty of Veterinary Medicine, CEU Cardenal Herrera University, Valencia
- Degree in Veterinary from the University of Zaragoza
- PhD in Biomedical Sciences, Auburn University, Alabama, USA
- Diploma of the American College of Internal Medicine, Large Animals
- Rotating internship in Equine Medicine and Surgery at the University of Lyon, VetAgro-Sup, France
- Residency in Equine Internal Medicine, J.T. Vaughan Large Animal Teaching Hospital, Auburn University, Alabama, U.S.
- Assistant Professor, Department of Animal Medicine and Surgery, Faculty of Veterinary Medicine, CEU Cardenal Herrera University, Valencia
- Professor and veterinary specialist in Equine Internal Medicine and research associate, Weipers Centre Equine Hospital, University of Glasgow, Scotland, United Kingdom

Dr. Badiola Díez, Juan José

- PhD in Veterinary from the Complutense University of Madrid
- Degree in Veterinary Medicine with Distinction and Extraordinary Award from the Complutense University of Madrid
- Diploma in Veterinary Pathology from the European College of Veterinary Pathology
- University Professor at the University of Zaragoza
- Full Professor and Associate Professor at the University of Zaragoza
- Assistant Professor and Interim Adjunct Professor at the Complutense University
- In all these positions he has taught the subjects of Veterinary Histology and Anatomic Pathology. Professional Experience
- President of the General Council of Veterinary Associations of Spain from 2001 to 2019
- Expert in transmissible spongiform encephalopathies (Scrapie and Bovine spongiform encephalopathy) Lentivirosis in small ruminants (Visna-Maedi and Caprine encephalitis arthritis). Diseases caused by mycobacteria (Paratuberculosis and tuberculosis)

Dr. Bracamonte, José Luis

- Founding Fellow of the American College of Veterinary Surgeons
- Doctorate in Veterinary Science in Equine Laparoscopy
- Degree in Veterinary Medicine, Faculty of Veterinary Medicine, University of Extremadura, Spain
- Diploma of the American College of Veterinary Surgery in large animals
- Diploma of the American College of Veterinary Surgery in large animals
- Diplomate, European College of Veterinary Surgeons (Equine)

- Certified by the European College of Equine Veterinary Surgery
- Minimally Invasive Surgery in Large Animal Laparoscopy
- Founder and specialist in minimally invasive laparoscopic surgery in large animals from the American College of Veterinary Surgery
- ACVS committee member for minimally invasive surgery specialist
- Teacher for ACVS Fellowship Programs
- Large animal surgery especially on horses in the disciplines of Western Pleasure, Barrel Racing, Reining, Cutting and Dressage horses
- Large animal surgeon in beef cattle/calf (Angus breed) and dairy cattle productions
- Training of 15 surgical residents, all of whom are ACVS Diplomates
- Presentations at international surgical congresses and more than 20 national presentations in Canada for equine veterinarians

Dr. Blanco Murcia, Francisco Javier

- Head of Service of the Clinical Service of Ruminants and Other Species of Abasto of the Clinical Veterinary Hospital (UCM)
- Director and owner of Los Molinos Large Animal Clinic
- PhD in Veterinary from the Complutense University of Madrid
- Degree in Veterinary Medicine from the Complutense University of Madrid
- Veterinary Diploma in Lidia Bull Studies
- Diploma of Clinical Anesthesiology in Companion Animals, UCM
- Specialist intern in Bovine Medicine and Surgery at the UCM Clinical Hospital. Category: director
- Diploma in Bovine Podiatry at Conafe. Category: director
- Consultant veterinarian, Association of Sanitary Defense of the Sierra de Guadarrama and collaborating agent authorized as certifying agent, recognized by the Community of Madrid in different years
- Founding member of ANEMBE, and First Treasurer of the association
- Two six-year research periods

Dr. Correa, Felipe

- PhD in Veterinary Sciences, Andrés Bello University, Santiago, Chile
- Degree in Veterinary Medicine from Mayor University, Santiago, Chile
- Internship in Equine Surgery at Milton Equine Hospital, Canada
- Internship in Surgery and Large Animal Medicine, University of Guelph, Canada
- Master's Degree in Veterinary Sciences, Austral University of Chile
- Diploma in University Teaching, Andrés Bello University, Santiago, Chile
- Master's Degree Candidate in Equine Surgery, University of Pretoria, South Africa

Mr. Delpón, Héctor Santo-Tomás

- Degree in Veterinary Medicine from the University of Zaragoza
- Degree in Veterinary Medicine from the University of Zaragoza with specializations in Clinical and Animal Production
- Postgraduate studies at the University of Liverpool, UK for the Certificate in Advanced Veterinary Practice (CertAVP)
- Volunteer in Mozambique to train local livestock farmers in milk production

Dr. Escribano, Miguel

- Degree in Veterinary Medicine from the University of Extremadura, and PhD in Veterinary Medicine from the same university in 1995
- Predoctoral Research Fellow 1992-1996. Agricultural Research Service. Government of Extremadura
- UEx Postdoctoral Research Fellow
- Assistant LRU Type I. Animal Production Technology and Animal Physiology. School of Agricultural Engineering. Agricultural Engineer
- Assistant LRU Type II. Animal Production Technology and Animal Physiology. School of Agricultural Engineering. Agricultural Engineer
- University Professor. Animal Production Technology and Animal Physiology. School of Agricultural Engineering. Agricultural Engineer
- University Professor. Animal Production Faculty of Veterinary Sciences. University of Extremadura
- Participation as a teacher in different Master's Degrees and Postgraduate Courses
- Director of a considerable number of Doctoral Theses, Bachelor's and Master's Degree Final Projects

Dr. González Orti, Noelia

- PhD from the University of Zaragoza
- Degree in Veterinary Medicine from the University of Zaragoza
- Associate Professor, teaching the subjects of Reproduction and Obstetrics and Integration of Ruminants
- Specialist in Animal Reproduction (1999, CIHEAM: Mediterranean Agronomic Institute of Zaragoza)
- Associate Professor in 2005 and 2007 at the University of Zaragoza (Spain) in the subject of Reproduction and Obstetrics and in the Master's Degree of Initiation to Research in Sciences
- Veterinarian at the Department of Animal Pathology
- In 2006 she obtained the Pedagogical Training Diploma. Since then, she has continued to complete her training in the programs of the Institute of Educational Sciences of Zaragoza in the field of teaching innovation
- Associate Professor in 2005 and 2007 at the University of Zaragoza (Spain) in the course of Reproduction and Obstetrics and in the Master's Degree of Initiation to Research in Veterinary Sciences, in the Department of Animal Pathology
- In 2006 she obtained the Pedagogical Training Diploma. Since then, she has continued to complete her training in the programs of the Institute of Educational Sciences of Zaragoza in the field of teaching innovation
- Her professional career is focused on the improvement of gamete and embryo preservation methods in different animal species

Dr. González Sagues, Adrián

- Founder and current manager of "ANKAPODOL S.L. Cuidados de Pezuñas"
- Internationally recognized trainer, collaborator of the English Laboratory program and director of the Spanish program of the Master's Degree of Podiatric Health at the University of Florida (USA), winner of the "Honor and Plow Awards" presented by Ann Veneman, Secretary of Agriculture of the United States
- Degree in Veterinary Medicine from the University of Zaragoza
- Partner and Technical Advisor in 4 hoof care companies, three of them in Spain and one in Mexico, trimming the hooves of about 70,000 cows per year with 12 employees
- Degree in Veterinary Medicine from the Complutense University of Madrid
- Clinical Veterinarian at Monge Veterinarios S.L.P.
- Associate Professor in the Department of Animal Medicine and Surgery UCM Veterinary Faculty
- Collaboration in the teaching of Ruminant Production Medicine at the Faculty of Veterinary Medicine of the Complutense University of Madrid from 2008 to 2014
- Tutor in Final Degree Projects since 2015
- Clinical veterinarian in Santa Teresa Veterinary Clinic
- Collaboration in the work team of the research project, Parasite-host interaction in bovine Besnoitiosis: Study of the molecular mechanisms in target cells and organs that determine the progression of infection
- Ministry of Economy, Industry and Competitiveness, Ref. AGL 2016- 75202-R
- Theoretical-practical course called Updating and New Applications of Musculoskeletal, Visceral and Reproductive Ultrasound in Bovine Species. U.C.M. Faculty of Veterinary Medicine
- Oral Communication ANEMBE Vigo, Clinical management of traumatic brain stem injuries in a calf
- Organizing Committee in ANEMBE Cáceres Seminar for beef cattle
- ANEMBE Vigo International Congress. ANEMBE Sevilla International Congress

Dr. Galapero Arroyo, Javier

- External advisor to national companies in the Agro-Livestock sector
- PhD in Veterinary Medicine from the University of Extremadura
- Degree in Veterinary Medicine from the University of Extremadura
- Master's Degree in Extensive Livestock Farming Management
- Teacher in different graduate and postgraduate courses, university specialization programs and master's degrees
- Development of doctoral theses and final projects in the Veterinary Degree and as external

expert evaluator and member of the tribunal of different doctoral theses
- Reviewer of scientific articles in three journals indexed in the Journal Citation Report (JCR)

Dr. Gil Huerta, Lydia
- PhD in Veterinary Medicine Sciences, University of Zaragoza
- Degree in Veterinary Medicine
- Higher Diploma in Animal Production
- Master of Science (CIHEAM)
- Director of the Department of Animal Pathology (Veterinary Faculty) since 2015 to the present
- Principal researcher of 38 Transfer and Research projects and five Infrastructure projects
- Developer of R&D&I Spin-Off Companies
- Publications: National (37); International (58)
- Participation in national and international conferences (220)
- She has three nationally recognized six-year research periods and one six-year transfer period (CNEAI)
- Director of 16 doctoral theses
- Member of the University Staff Board and of the Veterinary Faculty Board
- Member of the Health and Safety Committee of the University and the Faculty of Veterinary Medicine of Zaragoza

Dr. Gil Molino, María
- Responsible for the Diagnostic Service and performing clinical diagnostic tasks in different areas, mainly in Infectious Pathology, Parasitology and Pathological Anatomy and in Medical Pathology and Toxicology
- Degree in Veterinary Medicine from the University of Extremadura
- Completion of the Degree Work
- Diploma of Advanced Doctoral Studies
- Samples Reception and Veterinary Diagnostic Area at the Clinical Veterinary Hospital

Dr. Hornillo Gallardo, Andrés
- PhD in Veterinary Medicine from the University of Extremadura
- Degree in Veterinary Medicine from the University of Extremadura
- Venia Docendi granted to Scientific and Research personnel by the University of Extremadura in the area of Animal Production and Food Science
- Venia Docendi granted to Scientific and Research personnel by the University of Extremadura in the area of Animal Production and Food Science and in the area of Economics, at the School of Agricultural Engineering
- Accreditation by the Technical Education Committee of the Teacher Evaluation Program of the National Agency for Quality Assessment and Accreditation (ANECA)
- Research in the analysis of extensive animal production systems. Analyzing sustainable production models, the technical and economic analysis of livestock and agri-food systems
- High level publications of the first decile in JCR. Participation in a regionally competitive project and inclusion in a research group of the University of Extremadura

Dr. Iglesias García, Manuel
- Clinical veterinarian and surgeon at the Veterinary Hospital of the Extremadura Hospital at the University of Extremadura
- PhD from the Alfonso X el Sabio University
- Degree in Veterinary Medicine from the Alfonso X el Sabio University (UAX)
- Master's Degree in Equine Surgery and obtained the title of "General Practitioner in Equine Surgery" from the "European School of Veterinary Postgraduate Studies"
- Master's Degree in Equine Surgery at the Veterinary Hospital of Alfonso X el Sabio University

- Spanish Certificate in Equine Clinic (CertEspCEq)
- He actively participates as director of final projects in the Veterinary Degree
- Collaboration in the teaching of veterinary interns and undergraduate students during the Master's Degree in Equine Surgery
- Professor of the Master's Degree in Large Animal Boarding at Extremadura University for the last 3 years

Dr. Luño Lázaro, Victoria

- PhD in Animal Medicine and Health, Excellent Cum-Laude, University of Zaragoza
- Degree in Veterinary Medicine and Animal Health, University of Zaragoza
- Master's Degree in Mammalian Reproductive Biology and Technology, University of Murcia, Spain
- Postgraduate Diploma in Statistics Applied to Health Sciences, UNED
- Associate Professor since 2016 and Assistant Professor Doctor since 2019 at the Faculty of Veterinary Medicine of Zaragoza (Spain) in the subjects of Reproduction and Obstetrics, Swine Integration, Equine Integration, Poultry and Rabbit Integration and Reproductive Biotechnologies in different animal species. She teaches in different graduate and postgraduate courses
- Faculty of Veterinary Medicine of the University of Zaragoza and the University of Murcia, and in the Official Master's Degree in Swine Health and Production and Official Master's Degree in Biology and Technology of Mammalian Reproduction
- Her professional career has been focused on the study of new techniques and protocols to improve the quality of cryopreserved semen in different domestic species such as swine and horses, analyzing different parameters of semen quality, functionality and fertility. Additionally, she is working on the development of new methods and media for oocyte and embryo vitrification to improve fertilization rates and embryo development in the laboratory

Dr. Muñoz Morán, Juan Alberto

- Member of the Examination Committee of the European College of Veterinary Surgeons
- Degree in Veterinary Medicine from the Complutense University of Madrid
- PhD in Veterinary Science
- Graduate of the European College of Veterinary Surgeons
- Graduated in Experimental Animals, category C, University of Lyon (France)
- Master's Degree in Veterinary Medicine Sciences from the Alfonso X el Sabio University, Madrid
- Residency in large animal surgery at the Veterinary University of Lyon
- Internship in equine surgery at London Equine Hospital, Ontario
- Internship in equine medicine and surgery at Lyon Veterinary University
- Professor of large animal surgery at the Veterinary University of Pretoria, South Africa
- Head of the Equine Surgery residency program at the Veterinary University of Pretoria, South Africa
- Head of the large animal surgery service and professor at Alfonso X el Sabio University, Madrid
- Head of the Postgraduate Master's Degree in Sports Medicine and Equine Surgery at the Alfonso X el Sabio University
- Head of the Postgraduate Master's Degree in Equine Surgery at Alfonso X el Sabio University
- Editor of the journal of equine veterinary medicine and surgery "Equinus"
- Equine surgery clinician at the Montreal Veterinary University
- Equine surgery clinician at the Veterinary University of Lyon
- Co-author of CD-ROM on Thoracic Extremity Anatomy of the Horse
- Partner Surgeon at the Veterinary Clinic of "Grand Renaud", Saint Saturnin, France
- Surgeon at the Equine Hospital of Aznalcóllar, Seville

Dr. Moreno Burgos, Bernardino

- PhD in Veterinary Medicine from the University of Zaragoza
- Degree in Veterinary Medicine from the University of Zaragoza
- Associate Professor from 2010 to 2016 at the University of Zaragoza, teaching in the subjects of Pathological Anatomy and Microbiology and Immunology
- Assistant Professor PhD from 2016 to present, teaching in the subjects of Pathological Anatomy and Microbiology
- Supervision of 3 doctoral theses (2 of them in progress), several bachelor's and master's degree theses, tutoring of scholarship holders, coordination of subjects

- Postdoctoral residency at the University of Edinburgh from 1995 to 1998, working on lentivirosis and ovine mycobacteriosis
- From 1998 to 2004, worked at the Basque Institute for Agricultural Research (NEIKER), performing pathological diagnosis and research activities
- From 2004 to 2009, work in the private diagnostic laboratory of EXOPOL, performing pathology diagnosis and research activities

Ms. Martín Cáceres, Leonor

- Director of the Farm in the Faculty of Veterinary Medicine
- Doctoral training and doctoral thesis
- Degree in Veterinary Medicine from the University of Extremadura
- PhD from the University of Extremadura with her thesis "Effect of supplementation with protected fat on goat milk production". Qualification: Oustanding Cum Laude
- Professor of Animal Production I, Animal Production II and Ethnology and animal management in the veterinary field, in the Animal Production and Food Science Area of the Veterinary School
- She teaches at the Tajo-Salor-Almonte Shepherds School organized by the Cooprado Foundation
- Management of 6 Veterinary Degree Final Projects carried out at the Veterinary Farm with sheep and goat herds

Ms. Martínez Asensio, Felisa

- Degree in Veterinary Medicine from in 1987
- PhD from the University of Zaragoza
- Specialist in Artificial Insemination of Livestock by the General Council of Veterinary Associations of Spain, the Faculty of Veterinary Medicine and the General Council of Aragón
- Specialist in Animal Reproduction from the Mediterranean Agronomic Institute of Zaragoza
- Associate Professor at the University of Zaragoza (Spain) in the subject of Reproduction and Obstetrics, and in the Master's Degree of Initiation to Research in Veterinary Sciences, in the Department of Animal Pathology
- She completed her training in the programs of the Education Sciences Institute of Zaragoza in the field of teaching innovation
- Tutor of 4th and 5th year students of the Veterinary Degree in the subject "Supervised External Practices of the Veterinary Degree"
- Tutor of 1st year students in the Orientation Program of the University of Zaragoza
- She actively participates as a tutor of final degree projects in the Veterinary Degree and as a member of the tribunal of different Doctoral Theses and final degree and Master's degree projects

Dr. Medina Torres, Carlos E.

- Veterinarian from the National University of Colombia
- Assistant Professor and Internal Medicine Specialist, School of Veterinary Medicine, Faculty of Science, University of Queensland
- PhD in Veterinary Science from the University of Guelph, Ontario
- Master of Science, University of Liverpool, England
- Diploma of the American College of Internal Medicine in the specialty of Large Animals and of the European College of Internal Medicine
- Certificate in University Teaching Practice (CUTP) from The University of Queensland
- PhD at the University of Queensland
- Assistant and Clinical Professor of Large Animal Internal Medicine at the Large Animal Clinic, Faculty of Veterinary Medicine and Animal Husbandry, National University of Colombia
- Research Associate in Sports Physiology at the Department of Morphology, Anatomy, Physiology and Pathology of the University of Messina, Italy
- Tutor, Teaching Assistant and Professor in Anatomy, Physiology, Internal Medicine of Production Animals and Internal Medicine and Surgery of Companion Animals
- Assistant Professor, Research Associate and Director of the Equine Herpes Virus Research Laboratory at the University of California, Berkeley, USA

- Equivalent to Senior Lecturer and Clinical Specialist in Internal Medicine at the University of Queensland, Australia

Dr. Parejo Rosas, Juan Carlos

- PhD in Veterinary Medicine from the University of Extremadura
- Degree in Veterinary Medicine from the University of Extremadura
- Master's Degree in Environmental Impact Assessment, Ecological Research Institute, Malaga
- University Specialist in Conservation of Domestic Animal Breeds. University of Cordoba (Official Degree)
- Associate Professor. Faculty of Veterinary Sciences. University of Extremadura
- "Luis de Cáceres" End of Degree Award. Extremadura Savings Bank
- Distinguished Alumni Diploma. Faculty of Veterinary Sciences. University of Extremadura
- Collaboration scholar. Department of Zootechnics. University of Extremadura
- Fernando Valhondo Callaff Scholarship Holder. Faculty of Veterinary Sciences. University of Extremadura
- University Teacher Training Scholarship, Faculty of Veterinary Sciences, University of Extremadura
- Associate Professor. Faculty of Veterinary Sciences. University of Extremadura
- Director of Doctoral Theses, Bachelor's and Master's Degree Final Projects
- He has been granted the recognition of 2 teaching evaluation sections as "Outstanding"

Dr. Quinteros, Diego Daniel

- Degree in Veterinary Medicine from the University of Buenos Aires, Argentina
- Diploma from the American College of Veterinary Surgeons
- Veterinary Surgeon at Integral Equine Veterinary Services - Pincen, Córdoba
- Diagnosis and treatment of claudication in sporting equines at Performance Equine Services, Ocala
- Professor (Head of Practical Works) and Surgeon at the Large Animal Hospital of the University of the Center of the Province of Buenos Aires
- Associate Veterinarian at the Equine Reproduction Center "Doña Pilar" - Lincoln, Province of Buenos Aires
- Member of the surgical team at the Veterinary Center of the Hippodrome of San Isidro-San Isidro, Buenos Aires, Argentina
- Private outpatient practice at the San Isidro Hippodrome-San Isidro, Buenos Aires
- Intensive care of colic patients
- San Isidro Hippodrome Veterinary Center-San Isidro, Buenos Aires

Dr. Re, Michela

- PhD in Veterinary Medicine from the Complutense University of Madrid
- Degree in Veterinary Medicine from the State University of Milan
- Veterinarian of the Los Molinos Large Animal Clinic developing clinical activity in equines and bovines
- Veterinarian of the Sierra de Guadarrama Sanitary Defense Association and collaborating agent authorized as Certifying agent, recognized by the Community of Madrid
- "Assistance activity at the Complutense Clinical Veterinary Hospital", developing the activity in the Large Animal Surgery Service of the Complutense Clinical Veterinary Hospital

Dr. Rodríguez Medina, Pedro Luis

- Secretary, Vice-Dean and Dean of the Faculty of Veterinary Medicine of the University of Extremadura
- Professor of Animal Nutrition at the University of Extremadura since July 1990
- PhD in Veterinary Medicine from the University of Extremadura
- Degree in Veterinary Medicine from the University of León
- Associate Professor of Animal Production at the University of Extremadura during the years 1985-1987. Associate Professor of Animal Production at the University of Extremadura during the years 1987-1988. Assistant Professor of Animal Nutrition at the University of Extremadura during the years 1988-1989. Interim Professor of Animal Nutrition at the

University of Extremadura during the years 1989-1990

- He teaches in the Veterinary Degree, as well as in the Master's Degree in Meat Science and Technology and the Clinical Internship of the UEX. He is coordinator of the Animal Production Area in the practical subjects of the Veterinary Degree "Outpatient Clinic and Animal Production Activities" and "Livestock Resources, Hygiene and Food Technology"
- He has supervised eight doctoral theses and is an ENAC Technical Expert in Near Infrared Reflectance Spectroscopy
- Professional career linked to sheep feed research and development in permanent contact with sheep sector cooperatives
- Participation in multiple research projects related to the sheep sector
- Direct research contracts with cooperative companies in the sheep and cattle sector
- Secretary, Vice-Dean and Dean of the Faculty of Veterinary Medicine of the University of Extremadura

Ms. Sardoy, María Clara

- Integral Equine Veterinary Services Pincén in Córdoba, Argentina
- Degree in Veterinary Medicine from the University of Buenos Aires, Argentina
- Master's Degree in Clinical Sciences, Kansas State University, USA
- Internship in Equine Internal Medicine Kansas State University-Manhattan, KS, USA
- Residency in Equine Clinical Theriogenology at Equestrian Club Buenos Aires, Buenos Aires, Argentina
- Faculty member at Milton Equine Hospital in Campbellville, ON, Canada

Dr. Soler Rodríguez, Francisco

- Professor of Toxicology at the Department of Animal Health Medicine of the University of Extremadura in Cáceres
- PhD in Veterinary Medicine from the University of Cordoba, doing his doctoral thesis on veterinary plant toxicology at the Department of Pharmacology and Toxicology of the Faculty of Veterinary Medicine of Cordoba
- Degree in Veterinary Medicine from the University of Córdoba (Degree thesis on plant intoxication)
- All his teaching experience has been focused on veterinary Toxicology, starting as a collaborator in the Department of Pharmacology and Toxicology of the Faculty of

Veterinary Medicine of Cordoba during the academic year 1984/85

- Since 1987, he has taught the subjects of Veterinary Toxicology and Veterinary Law and Deontology in the Bachelor's Degree and later in the Degree in Veterinary Medicine. University of Extremadura
- In addition to teaching graduate courses, he also teaches in different postgraduate courses and university specialization master's degrees

Dr. Zalduendo Franco, Daniel

- Technical and commercial management at ANKA
- Coordination of podiatry services with sales and marketing of podiatric health products and foals at ANKA
- Degree in Veterinary Medicine from the University of Zaragoza in 2007 with specializations in Clinical and Animal Production
- Postgraduate studies at the University of Liverpool (UK) to obtain the Certificate in Advanced Veterinary Practice (CertAVP)
- Coordination of HIPRA's Mastitis Unit, enabling it to offer vaccines and services to more than 50 countries

Ms. Zurita, Sofía Gabriela

- Degree in Veterinary Medicine from the Catholic University of Salta, Argentina
- Master's Degree in Companion Animal Medicine and Surgery (Small Animals and Equidae); Specialty in Equidae. Faculty of Veterinary Medicine, University of Extremadura
- Currently a PhD student at the University of Extremadura
- From 2018 to the present, Veterinarian in the Reception and Diagnostic Service of biological samples of the Veterinary Clinical Hospital of the University of Extremadura
- Scientific activity, developed in Argentina and currently in Spain, participating in publications on meat quality and infectious diseases
- Courses and internships in Argentina at the Animal Health Laboratory - INTA EEA Cerrillos-Salta, Meat Quality Laboratories INTA Balcarcee Institute of Food Technology Castelar, as well as in Spain at the University of Extremadura
- Internal Large Animal Veterinary Medicine, Internship in Companion Animal Medicine and Surgery (Small Animals and Equids); Specialty in Equids. HCV – UEx
- Veterinary Clinics in Emergency Services for small and large animals in the city of Salta, Argentina
- Organizer of the 3rd NOA Student Veterinary Conference, Salta - Argentina

The leading professionals in the field have come together to offer you the most comprehensive knowledge in this field, so that you can advance with total guarantees of success"

05

Structure and Content

The contents of this Master's Degree have been developed by the different experts on the course, with a clear purpose: to ensure that our students acquire each and every one of the necessary skills to become true experts in this field.

A complete and well-structured program that will lead the professional to the highest standards of quality and success.

A comprehensive teaching program, structured in well-developed teaching units, oriented towards learning that is compatible with your personal and professional life"

Module 1. Clinical Skills

1.1. Handling and Restraint of Cattle
- 1.1.1. Introduction
- 1.1.2. Physical Immobilization Methods
  - 1.1.2.1. Head
  - 1.1.2.2. Limbs
  - 1.1.2.3. Immobilization Devices
- 1.1.3. Animal Takedown
  - 1.1.3.1. Takedown Systems
  - 1.1.3.2. Handling in Decubitus Position

1.2. Veterinary Equipment in Field Clinics
- 1.2.1. Introduction
- 1.2.2. Examination Material
- 1.2.3. Surgical Material
- 1.2.4. Obstetrical Material
  - 1.2.4.1. Childbirth
  - 1.2.4.2. Insemination
  - 1.2.4.3. Breeder Assessment
- 1.2.5. Sample Extraction Material
- 1.2.6. Drug Administration Material
- 1.2.7. Fluid Therapy Material
- 1.2.8. Medication
  - 1.2.8.1. Antibiotic Therapy
  - 1.2.8.2. Anti-Inflammatories
  - 1.2.8.3. Hormonal
  - 1.2.8.4. Metabolic and Vitamin
  - 1.2.8.5. Anti-Parasitics II

1.3. Herd Health Research
- 1.3.1. Introduction
- 1.3.2. Definition of Health and Disease
- 1.3.3. Animal Welfare: Indicators and Determinants
  - 1.3.3.1. Stress
  - 1.3.3.2. Management
  - 1.3.3.3. Hygiene
  - 1.3.3.4. Transport
- 1.3.4. Health
  - 1.3.4.1. Disease Transmission
  - 1.3.4.2. Registration and Controls
  - 1.3.4.3. Individual and Herd Clinical Assessment
  - 1.3.4.4. Complementary Tests
  - 1.3.4.5. Reporting and Monitoring

1.4. Diagnosis and Clinical Reasoning
- 1.4.1. Introduction
- 1.4.2. Diagnostic Process
  - 1.4.2.1. Clinical Examination
  - 1.4.2.2. Hypothetical-Deductive Reasoning
  - 1.4.2.3. Archive
- 1.4.3. Reasoning Patterns
  - 1.4.3.1. Pattern Recognition Methods
  - 1.4.3.2. Probability
  - 1.4.3.3. Pathophysiological Reasoning
- 1.4.4. Clinical Signs and Diagnostic Tests
  - 1.4.4.1. Logical Exclusion of Disease
  - 1.4.4.2. Inductive-Deductive Reasoning
- 1.4.5. Errors
- 1.4.6. Clinical Reasoning Exercise
  - 1.4.6.1. Clinical Scenarios
  - 1.4.6.2. Clinical Examination
  - 1.4.6.3. Clinical Reasoning

1.5. Special Diagnostic Procedures
- 1.5.1. Introduction
- 1.5.2. Skin
- 1.5.3. Cardiovascular
  - 1.5.3.1. Percussion
  - 1.5.3.2. Electrocardiography
  - 1.5.3.3. Ultrasound
  - 1.5.3.4. Radiography

1.5.3.5. Pericardiocentesis
1.5.3.6. Blood Culture
1.5.4. Respiratory System
1.5.4.1. Bronchoalveolar Lavage
1.5.4.2. Parasitological Tests
1.5.4.3. Nasal Swabs
1.5.4.4. Radiography
1.5.4.5. Ultrasound
1.5.4.6. Thoracentesis
1.5.4.7. Biopsy
1.5.4.8. Biomarkers
1.5.5. Abdomen
1.5.5.1. Rectal Examination
1.5.5.2. Rumen Fluid Analysis
1.5.5.3. Abdominocentesis
1.5.5.4. Radiography
1.5.5.5. Hepatic Biopsy
1.5.5.6. Liver Function Test
1.5.5.7. Urinary
1.5.6. Mammary Glands
1.5.6.1. California Mastitis Test
1.5.6.2. Conductivity
1.5.6.3. Collection for Microbiological Analysis
1.5.7. Musculoskeletal System
1.5.7.1. Arthrocentesis
1.5.8. Cerebrospinal Fluid Analysis
1.6. Antimicrobial Therapy in Cattle
1.6.1. Introduction
1.6.2. Characteristics of the Different Groups of Antimicrobials
1.6.2.1. Sulfonamides
1.6.2.2. Penicillins
1.6.2.3. Tetracyclines
1.6.2.4. Macrolides
1.6.2.5. Aminoglycosides

1.6.2.6. Cephalosporins
1.6.2.7. Lincosamides
1.6.3. Categorization of Antibiotics According to the Risk of their Use
1.6.4. Selection of an Antimicrobial According to the Process
1.6.5. Bacterial Resistance to Antimicrobials
1.7. Fluid Therapy
1.7.1. Introduction
1.7.2. Fluid Therapy in Calves
1.7.2.1. Lactic Acidosis in Calves
1.7.3. Fluid Therapy in Adult Cattle
1.7.3.1. Sodium Balance and Dysnatremia
1.7.3.2. Hypokalemic Syndrome in Cattle
1.7.3.3. Calcium and Magnesium Disorders
1.7.3.4. Treatment of Phosphorus Balances
1.7.4. Fluid Therapy in Small Ruminants
1.7.5. Use of Blood and Blood Products in Ruminants
1.8. Analgesia
1.8.1. Assessment of Pain in Cattle
1.8.2. Negative Effects of Pain
1.8.2.1. Chronic Pain
1.8.2.2. Acute Pain
1.8.3. Strategies for the Treatment of Pain
1.8.3.1. Preventive Analgesia
1.8.3.2. Multimodal or Balanced Analgesia. Analgesic Drugs
1.8.3.3. Opioids
1.8.3.3.1. Pure Agonists
1.8.3.3.2. Partial Agonists
1.8.3.4. α2-Agonists: Xylazine, Detomidine
1.8.3.5. NSAIDs: Ketoprofen, Carprofen, Meloxicam
1.8.3.6. Local Anesthetic. Lidocaine
1.8.3.7. Dissociative Anesthetics. Ketamine
1.8.4. Local Anesthetics
1.8.4.1. Transduction
1.8.4.2. Peripheral of Conduction Blockages
1.8.4.3. Intravenous Regional Anesthesia
1.8.4.4. Nerve Blocks
1.8.4.5. Epidural Administration of Drugs
1.8.4.6. α2-Agonists:
1.8.4.6.1. α2-Agonists Mechanism of Action, Adverse Effects, Antagonists
1.8.4.6.2. Routes of Administration. Epidural, IV, IM, SC
1.8.5. Combination with Other Drugs: Local Anesthetics, Opiates, Ketamine
1.8.5.1. NSAIDS
1.8.5.2. Mechanism of Action
1.8.5.3. Types of NSAIDs
1.8.5.4. Central Modulatory Inhibitory Effect
1.8.5.5. Preoperative and Postoperative Application
1.8.5.6. Anesthetics
1.9. Sedation and Anesthesia Effect
1.9.1. Introduction
1.9.2. Pharmacological Immobilization
1.9.2.1. Means of Teleapplication
1.9.2.1.1. Directly in a Crate or Sleeve Handle
1.9.2.1.2. By Syringe
1.9.2.1.3. At a Distance, Adminstering the Drug with Darts
1.9.3. Animal in Decubitus or Standing Animal
1.9.3.1. Tranquilization Methods
1.9.3.2. Animal Standing Combining Sedative and Local Anesthesia Techniques
1.9.4. Pharmacological Immobilization plus Locoregional Anesthesia
1.9.4.1. The α2-Receptor Agonist Tranquilizers: Xylazine, Detomidine, Romifidine, Medetomidine
1.9.4.2. Advantages of α2-Receptor Agonists
1.9.4.2.1. Volume
1.9.4.2.2. Sedative Effect
1.9.4.2.3. Analgesic
1.9.4.2.4. Mixed
1.9.4.2.5. Antagonizable
1.9.4.3. Disadvantages of α2-Receptor Agonists
1.9.4.4. Intraoperative and Postoperative Analgesia

1.9.4.4.1. α2, Opiates, Ketamine and Tiletamine
1.9.4.4.2. Local and Regional Anesthesia
1.9.4.4.3. NSAIDs (Non-Steroidal Anti-Inflammatory Drugs)

1.10. Local and Regional Analgesia
1.10.1. Incision Line Infiltration Blockage
1.10.2. Inverted Block
1.10.2.1. Inverted L-Block
1.10.2.2. Paravertebral Block
1.10.2.2.1. Proximal and Distal Paravertebral Anesthesia
1.10.2.2.2. Dorsal and Ventral Branch Blockage
1.10.3. Epidural Anesthesia
1.10.3.1. Administration
1.10.3.2. Localization
1.10.3.3. Indications
1.10.3.4. The Doses
1.10.3.5. Duration of Effect
1.10.3.6. Applied Pharmacological Combinations
1.10.4. Anesthetics
1.10.4.1. Ketamine
1.10.4.2. Tietamine
1.10.4.3. Etorphine. Prohibited its Use, Possession and Commercialization
1.10.4.3.1. Withdrawn from the Market in 2005
1.10.5. Update on Anesthesia in Cattle and Other Ruminants
1.10.5.1. New Anesthetic Protocol
1.10.5.2. Anesthetic Model
1.10.5.3. Anesthetic Combination. Phencyclidines-Detomidine
1.10.5.3.1. Zolazepam-Tiletamine
1.10.5.3.2. Ketamine
1.10.5.3.3. Detomidine
1.10.6. Maintaining the Anesthesia
1.10.6.1. Dosage
1.10.6.2. Antagonization
1.10.6.2.1. Precautions
1.10.6.2.2. Basic Anesthetic Monitoring
1.10.7. Anesthetic Depth
1.10.7.1. Cardiovascular System
1.10.7.2. Heart Rate
1.10.7.3. Peripheral Pulse Palpation
1.10.7.4. Capillary Refill Time
1.10.7.5. Respiratory System
1.10.7.6. Respiratory Rate and Pattern
1.10.7.7. Mucosal Color
1.10.7.8. Electronic Monitors: Portable Pulse Oximeter

Module 2. Animal Production and Anatomopathological Diagnosis

2.1. Necropsy and Anatomopathological Diagnosis in Cattle
2.1.1. Cattle Necropsy
2.1.2. Respiratory Pathology
2.1.3. Digestive Pathology
2.1.4. Renal Pathology
2.1.5. Nervous Pathology
2.1.6. Reproductive Pathology
2.1.7. Other Pathologies
2.2. Necropsy and Anatomopathological Diagnosis in Small Ruminants
2.2.1. Systematic Necropsy Procedure in Small Ruminants
2.2.2. Necropsy in the Field
2.2.3. Pathological Diagnostic Reasoning
2.2.4. Anatomopathological Diagnosis and Main Lesions by Organs and Systems
2.2.5. Anatomopathological Report
2.2.6. The Suspicion and Anatomopathological Diagnosis of Emerging Diseases in Small Ruminants
2.3. Transmissible Spongiform Diseases
2.3.1. Introduction
2.3.2. Etiology
2.3.3. Clinical Picture of Each Disease
2.3.4. Characteristic Lesions
2.3.5. Pathogenesis
2.3.6. Sensitive and Resistant Genotypes
2.3.7. Transmission Mechanisms

2.3.8. Diagnostic Methods
2.3.9. Epidemiology
2.3.10. Monitoring and Control System
2.3.11. Implications for Human Health

2.4. Dairy Cattle Nutrition
2.4.1. Dairy Cattle Feeding, Reference Standards
2.4.2. Evolution of Energy, Protein, Vitamin, Mineral Requirements and Intake Capacity throughout the Production Cycle
2.4.3. Feeding Systems Used: Grazing, in Intensive Systems
2.4.4. Feeding Strategies for the Mitigation of the Environmental Impact of Bovine Milk Production with Feed Origin
2.4.5. Conclusions

2.5. Meat Cattle Nutrition
2.5.1. Beef Cattle Feeding, Reference Standards
2.5.2. Evolution of Energy, Protein, Vitamin, Mineral Requirements and Intake Capacity throughout the Production Cycle
2.5.3. Feeding Systems Used: Herds of Breeding Cows and Calf Feedlots
2.5.4. Feeding Strategies for the Mitigation of the Environmental Impact of Bovine Meat Production with Feed Origin
2.5.5. Conclusions

2.6. Nutrition in Small Ruminants
2.6.1. Feeding of Sheep and Goats, Reference Standards
2.6.2. Evolution of Energy, Protein, Vitamin, Mineral Requirements and Intake Capacity throughout the Production Cycle
2.6.3. Feeding Systems Used: Female Breeding Herds and Lamb Feedlots
2.6.4. Feeding Strategies for the Mitigation of the Environmental Impact of Sheep and Goat Meat Production with Feed Origin
2.6.5. Conclusions

2.7. Dairy Cattle Management and Production. Main Production Indexes in the Context of Sustainable Farm Management and Animal Welfare
2.7.1. The Animal Base and Farming Systems
2.7.1.1. Intensive Dairy Cattle Systems
2.7.1.2. Dairy Cattle Grazing
2.7.2. Main Production Indicators and their Relation to the Lactation Curve
2.7.2.1. Components of the Lactational Cycle
2.7.2.2. Relationship between Production, Persistency and Milk Quality
2.7.2.3. Factors Inherent to Production
2.7.2.4. External Factors
2.7.2.5. Main Productive and Reproductive Indicators
2.7.3. Sustainable Dairy Cattle Farm Management and Animal Welfare. Adaptation to Climate Change
2.7.3.1. Adaptation Mechanisms
2.7.3.2. Protection Against Heat and Water Stress
2.7.3.3. New Climatic Patterns and their Impact on Vegetation and Animal Feed Crops
2.7.3.4. Adaptation through Genotype Selection and Mitigation Systems
2.7.3.5. Impact of Dairy Cattle Farms on Global Atmospheric Warming
2.7.4. Conclusions

2.8. Management of Extensive and Fattening Beef Cattle Farms. Indicators and New Production Trends
2.8.1. Farming Systems and New Management Trends
2.8.1.1. Suckler Cow Farming Systems and Calf Production at Weaning
2.8.1.2. Intensive Calf Fattening
2.8.1.3. Fattening in Grazing
2.8.1.4. Ecological Production Systems
2.8.1.5. Systems Based on Farm Self-Sufficiency and Rotational Grazing
2.8.2. Main Management and Production Indicators
2.8.2.1. Livestock Pressure
2.8.2.2. Growth Indicators and Meat Potential
2.8.2.3. Production Quality Indicators
2.8.3. Adaptation to Climate Change in Beef Cattle Farms
2.8.3.1. Effects on Production Yields
2.8.3.2. New Food Basis
2.8.3.3. Carbon Sequestration in Extensive Cattle Farms as a Mitigation Measure
2.8.4. Conclusions

2.9. Production Indices in Sheep Meat Farms. Productive Yields and Management of Dairy Sheep
- 2.9.1. Production Indexes in Small Ruminant Farms
- 2.9.2. Breeder Management
- 2.9.3. Replacement Management
- 2.9.4. Improved Reproductive Efficiency
- 2.9.5. Design of Reproductive Calendars in Sheep Meat
- 2.9.6. Design of Reproductive Calendars in Dairy Sheep and Goats

2.10. Genomic Selection vs. Classical Selection in Cattle and Small Ruminants
- 2.10.1. Genetic Structure of Animal Populations. Consanguinity and Kinship Estimation
- 2.10.2. Estimation of Population Genetic Parameters
  - 2.10.2.1. Repeatability. Estimation and Applications
  - 2.10.2.2. Heritability. Estimation and Applications
- 2.10.3. Genealogies. The Genealogical Kinship Matrix
- 2.10.4. BLUP. Classical Methodology for Genetic Selection
  - 2.10.4.1. History and Concept of the Method
  - 2.10.4.2. Components of the Mixed Model
  - 2.10.4.3. Resolution of the Mixed Model. Matrix Algebra
- 2.10.5. Genomics. Concept and Use in Genetic Improvement
- 2.10.6. The Genomic Kinship Matrix
- 2.10.7. New BLUP Models. "Single Step Model"

Module 3. Reproduction

3.1. Reproductive Cycle. Control Methods
- 3.1.1. Characteristics of the Estrous Cycle in the Cow
  - 3.1.1.1. Hormonal Mechanisms
  - 3.1.1.2. Phases of the Estrous Cycle
- 3.1.2. Characteristics of the Estrous Cycle in the Sheep and Goat
  - 3.1.2.1. Reproductive Season. Phases of the Estrous Cycle
  - 3.1.2.2. Anestrus
- 3.1.3. Cow Synchronization Methods
  - 3.1.3.1. Natural Methods
  - 3.1.3.2. Pharmacological Methods
- 3.1.4. Synchronization Methods in Sheep and Goats
  - 3.1.4.1. Natural Methods
  - 3.1.4.2. Pharmacological Methods
- 3.1.5. Ovulation Induction Systems

3.2. Gestation and its Diagnosis
- 3.2.1. Gestation in Cattle
  - 3.2. 1.1. Fertilization and Implantation
  - 3.2. 1.2. Fetal Loss (Early Loss)
  - 3.2. 1.3. Embryonic Mortality
  - 3.2. 1.4. Abortion
- 3.2.2. Gestational Pathology
  - 3.2.2.1. Hydramnios
  - 3.2.2.2. Hydroallantois
  - 3.2.2.3. Fetal Mummification
  - 3.2.2.4. Fetal Maceration
  - 3.2.2.5. Fetal Malformations and Altered Offspring Syndromes
  - 3.2.2.6. Uterine Torsion
- 3. 2.3. Gestation Diagnosis
  - 3.2.3.1. Diagnostic Methods
  - 3.2.3.2. Diagnosis by Palpation
  - 3.2.3.3. Ultrasound Diagnosis
  - 3.2.3.4. Embryo Sexing
  - 3.2.3.5. Determination of Fetal Viability

3.3. Genital Apparatus Diseases in Females
- 3.3.1. Anatomical Reminder of the Genital Apparatus of Cows and Sheep
- 3.3.2. Congenital Disorders
- 3.3.3. Pathologies of the Reproductive System
  - 3.3.1.1. Ovarian Pathologies
  - 3.3.1.2. Oviduct Pathologies
  - 3.3.1.3. Uterine Pathologies
  - 3.3.1.4. Uterine Cervix Pathologies
  - 3.3.1.5. Pathologies of the Vagina and Vulva

3.4. Diseases of the Genital Tract of Bulls and Rams for Breeding Purposes
- 3.4.1. Anatomical Recap of the Genital Apparatus
- 3.4.2. Infertility and Impotence
- 3.4.3. Reproductive System Pathologies
  - 3.4.3.1. Scrotal Pathology
  - 3.4.3.2. Testicular Pathology
  - 3.4.3.3. Epididymal Pathology
  - 3.4.3.4. Accessory Gland Pathology
  - 3.4.3.5. Foreskin Pathology
  - 3.4.3.6. Penile Disorders

3.5. Abortion. Causes
- 3.5.1. Types of Abortions
  - 3.5.1.1. Abortions due to Non-Infectious Causes
  - 3.5.1.2. Abortions due to Infectious Causes

3.6. Birth. Control and Detection Methods
- 3.6.1. Physioendocrinology of Childbirth
- 3.6.2. Phases of Labor
  - 3.6.2.1. Prodromal Phase
  - 3.6.2.2. Dilatation Phase
  - 3.6.2.3. Expulsion Phase
  - 3.6.2.4. Delivery Phase
- 3.6.3. Delivery Management
  - 3.6.3.1. Feed Control
  - 3.6.3.2. Maternity Ward
- 3.6.4. Control of Labor
  - 3.6.4.1. Labor Induction
  - 3.6.4.2. Delivery Time Detection System

3.7. Dystocia and its Resolution. Cesarean Section
- 3.7.1. Labor in Cattle
  - 3.7.1.1. Dystocia vs. Eutocic Labor
    - 3.7.1.1.1. Dystocia in Cattle Origin and Cause
    - 3.7.1.1.2. Genotypic
  - 3.7.1.2. Phenotypic
  - 3 7.1.3. Dystocia Resolution Techniques
    - 3.7.1.3.1. Presentation and Position: Repositioning and Solution
    - 3.7.1.3.2. Disproportion
    - 3.7.1.3.3. Necessary Material and Medication
    - 3.7.1.3.4. Traction Mode and Material
    - 3.7.1.3.5. Resolution of Uterine Torsion
  - 3.7.1.4. Fetotomy
    - 3.7.1.4.1. Partial
    - 3.7.1.4.2. Complete
  - 3.7.1.5. Cesarean Section in Cattle
    - 3.7.1.5.1. Indications
  - 3.7.1.6. Station or Decubitus Cesarean Section
    - 3.7.1.6.1. Surgical Defects. Description and Indications
    - 3.7.1.6.2. For Left and Right Lumbar
    - 3.7.1.6.3. For Medial
  - 3.7.1.7. Pre-Post Medication and Postoperative Management
    - 3.7.1.7.1. Analgesia
    - 3.7.1.7.2. Antibiotic Therapy
    - 3.7.1.7.3. Uterine Relaxants
    - 3.7.1.7.4. Specific Anesthetic Protocols

3.8. Puerperium. Associated Pathologies in the Mother
- 3.8.1. Phases of the Puerperium
  - 3.8.1.1. Uterine Involution
  - 3.8.1.2. Endometrial Regeneration
  - 3.8.1.3. Elimination of Bacterial Contamination
  - 3.8.1.4. Resumption of Ovarian Activity
- 3.8.2. Puerperal Pathology
  - 3.8.2.1. Placenta Retention
  - 3.8.2.2. Postpartum Hemorrhage: Diagnosis and Treatment
  - 3.8.2.3. Postpartum Prolapses: Diagnosis and Treatment of Bladder Prolapse, Rectal Prolapse, Uterine Prolapse
  - 3.8.2.4. Puerperal Metritis

3.9. Lactation. Mammary Gland Pathology
- 3.9.1. Mammary Glands. Structure
- 3.9.2. Operation

3.9.2.1. Mammogenesis
3.9.2.2. Lactogenesis
3.9.2.3. Galactopoiesis
3.9.3. Mammary Gland Pathology
3.9.3.1. Skin and Nipple Disorders
3.9.3.2. Edema
3.9.3.3. Mammitis
3.9.4. Drying Methods
3.10. Reproductive Biotechnologies. Current Applications
3.10.1. Sperm Preservation
3.10.1.1. Refrigeration Techniques. Diluents
3.10.1.2. Seminal Freezing Methodology
3.10.1.3. Vitrification
3.10.1.4. Sperm Lyophilization
3.10.2. Artificial Insemination (AI)
3.10.2.1. AI Methods in Cows
3.10.2.2. AI Methods in Small Ruminants
3.10.3. Sperm Selection. Sexing
3.10.4. Embryo Production
3.10.4.1. Oocyte Retrieval. Ovum Pick Up Technique (OPU)
3.10.4.2. In Vitro Embryo Production
3.10.4.2.1. IVM, IVF and ICSI
3.10.4.2.2. Embryo Sexing
3.10.4.2.3. Embryo Preservation Techniques
3.10.4.2.4. Characteristics of an Embryo Production Laboratory
3.10.5. Embryo Transfer
3.10.5.1. Superovulation Treatments
3.10.5.2. Embryo Collection Technique
3.10.5.4. Assessment of Embryo Quality
3.10.5.5. Embryo Transfer. Recipient Selection and Methodology

Module 4. Cardiovascular, Respiratory and Hemolymphatic Diseases in Ruminants

4.1. Interpretation of Blood Tests in Bovines
4.1.1. Blood Count
4.1.2. Blood Biochemistry
4.1.3. Urinalysis
4.1.4. Bone Marrow
4.2. Interpretation of Blood Tests in Small Ruminant
4.2.1. Blood Coun
4.2.2. Blood Biochemistry
4.3. Immunological and Hematopoietic Disorders in Cattle and Small Ruminants
4.3.1. Immune-Mediated Anemia
4.3.2. Anemia and the FAMACHA System
4.3.3. Thrombocytopenia
4.3.4. Bone Marrow Suppression
4.4. Cardiovascular Diseases in Cattle
4.4.1. Cardiovascular System Examination in Bovines
4.4.2. Congenital Cardiovascular Pathologies
4.4.3. Arrhythmias
4.4.4. Heart Failure and Cor Pulmonale
4.4.5. Valvular and Endocardial Diseases
4.4.6. Myocardial Diseases and Cardiomyopathies
4.4.7. Pericardial Diseases
4.4.8. Thrombosis and Embolism
4.4.9. Neoplasty
4.5. Cardiovascular Diseases in Small Ruminants
4.5.1. Cardiovascular System Examination in Small Ruminants
4.5.2. Congenital Cardiovascular Pathologies
4.5.3. Acquired Cardiovascular Pathologies
4.5.4. Toxic or Nutritional Deficiency Cardiopathies
4.5.5. Vascular Diseases

4.6. Examination of the Respiratory Tract and Diagnostic Tests in Ruminants
- 4.6.1. Anatomy and Physiology of the Respiratory Tract
- 4.6.2. Characteristic Clinical Signs of Respiratory Tract Disturbances
- 4.6.3. Physical Examination
  - 4.6.3.1. History
  - 4.6.3.2. General Physical Evaluation
  - 4.6.3.3. Examination of the Respiratory Tract
- 4.6.4. Diagnostic Imaging Techniques
  - 4.6.4.1. Radiography
  - 4.6.4.2. Ultrasound
  - 4.6.4.3. Others Diagnostic Imaging Techniques
- 4.6.5. Collection and Assessment of Respiratory Secretions
  - 4.6.5.1. Tracheal Aspirate and Bronchoalveolar Lavage
  - 4.6.5.2. Thoracentesis

4.7. Pathologies Affecting the Upper Respiratory Tract of Bovines
- 4.7.1. Nasal Cavity Diseases
  - 4.7.1.1. Bacterial or Mycotic Nasal Granuloma
  - 4.7.1.2. Allergic Rhinitis and Enzootic Nasal Granuloma
  - 4.7.1.3. Nasal Foreign Bodies
  - 4.7.1.4. Fractures
  - 4.7.1.5. Tumors and Polyps
  - 4.7.1.6. Congenital Problems
- 4.7.2. Sinus Diseases
  - 4.7.2.1. Sinusitis
- 4.7.3. Diseases of the Pharynx, Larynx and Trachea
  - 4.7.3.1. Alterations of Pharynx
  - 4.7.3.2. Necrotic Laryngitis or Necrobacillosis
  - 4.7.3.3. Other Laryngeal Disorders
  - 4.7.3.4. Tracheal Disorders

4.8. Bovine Respiratory Syndrome (BRS)
- 4.8.1. BRS Overview
- 4.8.2. Factors Involved in the Development of BRS
- 4.8.3. Main Pathogens Involved in BRS
  - 4.8.3.1. Viruses Involved in BRS
  - 4.8.3.2. Bacteria Involved in BRS

4.9. Other Causes of Pneumonia and Thoracic Disease in Bovines
- 4.9.1. Bovine Interstitial Pneumonia
- 4.9.2. Metastatic Pneumonia due to Thrombosis of the Cava Vein
- 4.9.3. Aspiration Pneumonia
- 4.9.4. Fungal Pneumonia
- 4.9.5. Bovine Tuberculosis
- 4.9.6. Other Disorders of the Thoracic Cavity

4.10. Respiratory Pathologies of Small Ruminants
- 4.10.1. Examination of the Respiratory System in Sheep and Goats
- 4.10.2. Upper Respiratory Tract Disorders
- 4.10.3. Pneumonia
- 4.10.4. Thoracic Cavity Disorders

Module 5. Ruminant Gastrointestinal and Urinary Tract Diseases

5.1. Examination of the Gastrointestinal Tract and Diagnostic Tests in Bovines
- 5.1.1. Anatomy and Physiology of the Gastrointestinal Tract
- 5.1.2. Characteristic Clinical Signs of Gastrointestinal Tract Disorders
- 5.1.3. Physical Examination
  - 5.1.3.1. History
  - 5.1.3.2. General Physical Evaluation
  - 5.1.3.3. Examination of the Gastrointestinal Tract
- 5.1.4. Diagnostic Imaging Techniques
  - 5.1.4.1. Radiography
  - 5.1.4.2. Ultrasound
  - 5.1.4.3. Others Diagnostic Imaging Techniques
- 5.1.5. Other Diagnostic Techniques
  - 5.1.5.1. Rumen Fluid Analysis
  - 5.1.5.2. Macroscopic Stool Examination
  - 5.1.5.3. Laparotomy or Exploratory Rumenotomy

5.2. Disorders of the Oral Cavity in Bovines
- 5.2.1. Dental and Salivary Gland Disorders
- 5.2.2. Actinobacillosis ("Wooden Tongue")
- 5.2.3. Actinomycosis ("Rubber Jaw")
- 5.2.4. Oral Necrobacillosis
- 5.2.5. Viruses Causing Mucosal Lesions
  - 5.2.5.1. Bluetongue
  - 5.2.5.2. Bovine Papular Stomatitis
  - 5.2.5.3. Vesicular Stomatitis
  - 5.2.5.4. Bovine Viral Diarrhea Virus (BVDV)
  - 5.2.5.5. Malignant Catarrhal Fever
  - 5.2.5.6. Foot and Mouth Disease
  - 5.2.5.7. Rinderpest

5.3. Indigestions and Traumatic Reticuloperitonitis in Bovines
- 5.3.1. Primary Indigestions
  - 5.3.1.1. Rumen Wall or Reticuloruminal Motor Disorders
    - 5.3.1.1.1. Traumatic Reticuloperitonitis
    - 5.3.1.1.2. Foamy Tympanism
    - 5.3.1.1.3. Gaseous Tympanism
    - 5.3.1.1.4. Reticulitis or Rumenitis
    - 5.3.1.1.5. Rumen Parakeratosis
    - 5.3.1.1.6. Vagal Indigestion
    - 5.3.1.1.7. Cardiac Obstruction
    - 5.3.1.1.8. Reticuloomasal Orifice Obstruction
    - 5.3.1.1.9. Diaphragmatic Hernia
  - 5.3.1.2. Reticuloruminal Fermentative Disorders
    - 5.3.1.2.1. Inactivity of Ruminal Microbial Flora
    - 5.3.1.2.2. Simple Indigestion
    - 5.3.1.2.3. Ruminal Acidosis
    - 5.3.1.2.4. Ruminal Alkalosis
    - 5.3.1.2.5. Putrefaction of Ruminal Intake
- 5.3.2. Secondary Indigestions
  - 5.3.2.1. Indigestions Secondary to Reticuloruminal Motor Inactivity
  - 5.3.2.2. Indigestions Secondary to Reticuloruminal Microflora Inactivity
  - 5.3.2.3. Abomasal Reflux

5.4. Abomasal Displacements and Other Abomasal Displacements in Bovines
- 5.4.1. Left Displacement of the Abomasum
- 5.4.2. Right Displacement of the Abomasum
- 5.4.3. Abomasal Torsion
- 5.4.4. Abomasal Ulcers
- 5.4.5. Abomasal Impaction

5.5. Obstructive Intestinal Disorders in Bovines
- 5.5.1. General Aspects
- 5.5.2. Intradigestive Mechanical Causes of Intestinal Obstruction
  - 5.5.2.1. Congenital
  - 5.5.2.2. Intestinal Intussusception
  - 5.5.2.5. Intestinal Volvulus
  - 5.5.2.4. Cecal Dilatation and Volvulus
  - 5.5.2.5. Neoplasty
  - 5.5.2.6. Rectal Prolapse
- 5.5.3. Extradigestive Mechanical Causes of Intestinal Obstruction
  - 5.5.3.1. Mesenteric Fat Necrosis
  - 5.5.3.2. Fibrous Adhesions
  - 5.5.3.3. Hernias
- 5.5.4. Other Causes of Intestinal Obstruction
  - 5.5.4.1. Intraluminal Obstruction
  - 5.5.4.2. Jejunal Hemorrhagic Syndrome

5.6. Bovine Diarrhea
- 5.6.1. Bacterial Diarrhea
  - 5.6.1.1. Paratuberculosis
  - 5.6.1.2. Salmonella
  - 5.6.1.3. Clostridiosis
- 5.6.2. Viral Diarrhea
  - 5.6.2.1. Bovine Viral Diarrhea Virus (BVDV)
  - 5.6.2.2. Coronavirus
  - 5.6.2.3. Other Viruses

5.6.3. Parasitic Diarrhea
5.6.4. Diarrhea Caused by Poisoning
5.6.5. Other Causes of Diarrhea
5.7. Small Ruminant Gastrointestinal Tract Examinations and Diagnostic Tests
5.7.1. Anatomy and Physiology of the Gastrointestinal Tract
5.7.2. Characteristic Clinical Signs of Gastrointestinal Tract Disorders
5.7.3. Physical Examination
5.7.3.1. History
5.7.3.2. General Physical Evaluation
5.7.3.3. Gastrointestinal Tract Examination
5.7.4. Diagnostic Imaging Techniques
5.7.4.1. Radiography
5.7.4.2. Ultrasound
5.7.4.3. Other Diagnostic Imaging Techniques
5.7.5. Other Diagnostic Techniques
5.7.5.1. Rumen Fluid Analysis
5.7.5.2. Macroscopic Stool Examination
5.7.5.3. Laparotomy or Exploratory Rumenotomy
5.8. Gastrointestinal Disorders of Small Ruminants
5.8.1. Disorders of the Oral Cavity
5.8.2. Indigestion and Other Pre-stomach Disorders
5.8.3. Enterotoxemia
5.8.4. Diarrhea in Adult Sheep and Goats
5.9. Bovine Urinary Diseases
5.9.1. Congenital Genitourinary Pathologies
5.9.2. Renal Damage and Failure
5.9.3. Other Kidney Diseases
5.9.4. Diseases of the Ureters, Bladder and Urethra
5.10. Urinary Diseases in Small Ruminants
5.10.1. Congenital Genitourinary Pathologies
5.10.2. Renal Damage and Failure
5.10.3. Other Kidney Diseases
5.10.4. Urinary Obstruction
5.10.5. Diseases of the Ureters, Bladder and Urethra

Module 6. Neurological and Ophthalmological Diseases

6.1. Neurological Examination and Main Diagnostic Tests in Bovines
6.1.1. Clinical Examination and Clinical Signs
6.1.2. Dynamic Assessment and Localization of the Lesion
6.1.3. Diagnostic Tests: Cerebrospinal Fluid Extraction and Analysis
6.1.4. Other Diagnostic Tests
6.2. Alterations Mainly Affecting the Brain in Bovines
6.2.1. Polioencephalomalacia
6.2.2. Other Causes. Bovine Spongiform Encephalopathies
6.2.3. Viral Disorders
6.2.3.1. Rabies
6.2.3.2. Bovine Herpesvirus Encephalomyelitis
6.2.3.3. Aujeszky's Disease
6.2.3.4. Other Viruses
6.2.4. Bacterial Disorders
6.2.4.1. Bacterial Meningitis
6.2.4.2. Pituitary Abscess
6.2.4.3. Others
6.2.5. Parasitic Disorders
6.2.5.1. Nervous Coccidiosis
6.2.5.2. Others
6.2.6. Intoxications
6.2.6.1. Urea Toxicity
6.2.6.2. Others
6.3. Disorders Mainly Affecting the Brainstem in Bovines
6.3.1. Listeriosis
6.3.2. Thromboembolic Meningoencephalitis
6.3.3. Otitis Media/Internal
6.3.4. Others
6.4. Disorders Mainly Affecting the Cerebellum in Bovines
6.4.1. Bovine Viral Diarrhea Virus (BVDV)
6.4.2. Tremorgenic Toxins
6.4.3. Others

6.5. Alterations Mainly Affecting the Spinal Cord in Bovines
- 6.5.1. Spinal Lymphoma
- 6.5.2. Vertebral Osteomyelitis
- 6.5.3. Trauma
- 6.5.4. Spastic Paresis
- 6.5.5. Spastic Paralysis
- 6.5.6. Botulism
- 6.5.7. Tetanus
- 6.5.8. Aberrant Parasitic Migration
- 6.5.9. Others

6.6. Alterations Mainly Affecting the Peripheral Nerves in Bovines
- 6.6.1. Suprascapular Nerve
- 6.6.2. Radial Nerve
- 6.6.3. Femoral Nerve
- 6.6.4. Sciatic Nerve
- 6.6.5. Obturator Nerve
- 6.6.6. Downer Cow Syndrome

6.7. Neurological Examination and Main Diagnostic Tests in Small Ruminants
- 6.7.1. Clinical Examination and Clinical Signs
- 6.7.2. Dynamic Assessment and Localization of the Lesion
- 6.7.3. Diagnostic Tests: Cerebrospinal Fluid Extraction and Analysis
- 6.7.4. Other Diagnostic Tests

6.8. Neurologic Disorders of Small Ruminants
- 6.8.1. Disorders Mainly Affecting the Brain in Small Ruminants
- 6.8.2. Disorders Mainly Affecting the Brainstem in Small Ruminants
- 6.8.3. Disorders Mainly Affecting the Cerebellum in Small Ruminants
- 6.8.4. Disorders Mainly Affecting the Spinal Cord in Small Ruminants

6.9. Cattle Ophthalmology
- 6.9.1. Cattle Eye Examination
- 6.9.2. Specific Management in the Examination
- 6.9.3. Ophthalmic Examination. Inspection
- 6.9.4. Probing and Washing of the Nasolacrimal Duct
- 6.9.5. Orbital Abnormalities

6.9.6. Anophthalmia, Microphthalmia
6.9.7. Exophthalmia and Enophthalmia
6.9.8. Inflammation and Orbital Cellulitis
6.9.9. Orbital Neoplasms
6.9.10. Eyelid Abnormalities
6.9.10.1. Palpebral Neoplasms
6.9.10.2. Ectropion and Entropion
6.9.10.3. Other Disorders of the Eyelids
6.9.11. Corneal and Conjunctival Diseases
6.9.11.1. Corneal Characteristics
6.9.11.2. Lacerations and Ruptures of the Cornea and/or Sclera
6.9.11.3. Corneal Foreign Bodies
6.9.11.4. Corneal Ulcers
6.9.11.5. Corneal Edema
6.9.11.6. Vascularization
6.9.11.7. Infectious Bovine Keratoconjunctivitis (IBK, Pink-Eye)
6.9.11.8. Conjunctival and Corneal Tumors. Squamous Cell Carcinoma
6.9.12. Uveal Diseases
6.10. Ocular Disorders in Small Ruminants
6.10.1. Orbital Diseases
6.10.2. Infectious Keratoconjunctivitis
6.10.3. Parasitic Keratitis
6.10.4. Retinal Degeneration
6.10.5. Blindness

Module 7. Metabolic, Endocrine and Dermatological Diseases in Ruminants. Toxicology and Neonatology

7.1. Bovine Dermatological Disorders
7.1.1. Congenital Dermatological Pathologies
7.1.2. Skin and Hair Diseases
7.1.3. Subcutaneous Diseases
7.1.4. Hoof and Horn Diseases
7.1.5. Cutaneous Neoplasms
7.2. Small Ruminant Dermatological Disorders
7.2.1. Congenital Dermatological Pathologies
7.2.2. Infectious Dermatitis
7.2.3. Vesicular and Mucocutaneous Junction Diseases
7.2.4. Hair and Wool Parasitic Diseases
7.2.5. Caseous Lymphadenitis
7.2.6. Skin and Adnexal Diseases Associated with Toxicity and Nutritional Problems
7.2.7. Cutaneous Neoplasms
7.3. Metabolic and Endocrine Disorders in Bovines
7.3.1. Ketosis
7.3.2. Calcium, Magnesium and Phosphorous Disorders
7.3.3. Other Endocrinopathies
7.4. Metabolic and Endocrine Disorders of Small Ruminants
7.4.1. Pregnancy Toxemia
7.4.2. Stump, Rickets
7.5. Nutritional Deficiencies in Bovines
7.5.1. Introduction
7.5.2. Copper Deficiencies
7.5.3. Selenium and Vitamin E Deficiencies
7.5.4. Cobalt Deficiencies
7.5.5. Iodine Deficiency
7.5.6. Manganese Deficiency
7.5.7. Iron Deficiency
7.5.8. Zinc Deficiency
7.5.9. Main Vitamin Deficiencies

7.6. Nutritional Deficiencies in Small Ruminants
- 7.6.1. Copper Deficiencies
  - 7.6.1.1. Enzootic Ataxia
  - 7.6.1.2. Bone Alterations
- 7.6.2. Cobalt Deficiencies
  - 7.6.2.1. Ill-Thrift
  - 7.6.2.2. White Liver Disease
- 7.6.3. Selenium Deficiencies
  - 7.6.3.1. White Muscle Disease
- 7.6.4. Vitamin E Deficiency
- 7.6.5. Iodine Deficiency
- 7.6.6. Deficiencies in Trace Elements

7.7. Main Intoxications in Ruminants I
- 7.7.1. Introduction. General Aspects
- 7.7.2. General Diagnostic and Therapeutic Guidelines for Intoxications
- 7.7.3. Intoxications Related to Ingestion of Toxic Plants
  - 7.7.3.1. Neurotoxic
  - 7.7.3.2. Hepatotoxic
  - 7.7.3.3. Nephrotoxic
  - 7.7.3.4. Phototoxic
  - 7.7.3.5. Cardiotoxic
  - 7.7.3.6. Anticoagulants
  - 7.7.3.7. Other Toxic Plants

7.8. Main Intoxications in Ruminants II
- 7.8.1. Mycotoxins
- 7.8.2. Feed Additive Intoxications
  - 7.8.2.1. Nitrogen Compounds (Urea)
  - 7.8.2.2. Copper
  - 7.8.2.3. Drugs
- 7.8.3. Environment-Related Intoxications
  - 7.8.3.1. Pesticides
  - 7.8.3.2. Inorganic Elements (Lead, Arsenic, Selenium, Fluorine...)
  - 7.8.3.3. Quality of Drinking Water
    - 7.8.3.3.1. Intoxications by Other Industrial and Commercial Chemical Compounds
      - 7.8.3.3.2. Therapeutic Guide in Ruminant Intoxications

7.9. Main Calf Problems
- 7.9.1. Congenital Diseases
- 7.9.2. Trauma and Death During Labor
- 7.9.3. Prematurity, Dysmaturity and Neonatal Maladjustment
- 7.9.4. Perinatal Diseases and Problems
- 7.9.5. Diseases Associated with Reproductive Biotechnologies
- 7.9.6. Failure of Transfer of Calostral Immunoglobulins

7.10. Main Problems of Neonatal Small Ruminants
- 7.10.1. Congenital Diseases
- 7.10.2. Prematurity, Dysmaturity and Neonatal Maladjustment
- 7.10.3. Perinatal Problems
- 7.10.4. Gastrointestinal Tract Diseases
- 7.10.5. Locomotor System Diseases
- 7.10.6. Failure of Colostral Immunoglobulins Transfer

Module 8. Infectious and Parasitic Diseases in Ruminants

8.1. Prevention and Control of Infectious Diseases
- 8.1.1. Laboratory Diagnostic Tests
- 8.1.2. Antimicrobial Treatments and Resistance
- 8.1.3. Use of Vaccines
- 8.1.4. Biosecurity and Control Measures

8.2. Bovine Vaccination Plan
- 8.2.1. There is No Single Vaccination Plan. Premises to Consider
- 8.2.2. Considerations to Be Taken into Account When Choosing a Vaccine
- 8.2.3. Vaccination Plans by Production System or Age Group
  - 8.2.3.1. Vaccination Plan for Dairy and Heifer Rearing

8.2.3.2. Vaccination Plan for Sucklers
8.2.3.3. Vaccination Plan for Meat and Heifer Rearing
8.2.3.4. Vaccination Plan for Grazing Fattening Cattle
8.2.3.5. Vaccination Plan for Dairy Cows
8.2.3.6. Vaccination Plan for Meat Cows
8.2.3.7. Stallion Vaccination Plan (Artificial Insemination Center)

8.3. Vaccination Plan for Small Ruminants
8.3.1. There is No Single Vaccination Plan. Premises to Consider
8.3.2. Considerations to Be Taken into Account When Choosing a Vaccine
8.3.3. Vaccination Plans by Production System or Age Group
8.3.3.1. Vaccination Plan for Rebreeding Dairy Ewe Lambs/Goats
8.3.3.2. Vaccination Plan for Rebreeding Meat Ewe Lambs/Goats
8.3.3.3. Vaccination plan for Fattening Ewe Lambs/Goats
8.3.3.4. Vaccination Plan for Dairy Sheep/Goats
8.3.3.5. Vaccination Plan for Meat Sheep/Goats

8.4. Main Bovine Infectious and Contagious Diseases I
8.3.1. Notifiable Diseases
8.3.2. Bacterial Diseases
8.3.3. Fungal Diseases

8.5. Main Bovine Infectious and Contagious Diseases II
8.5.1. Viral Diseases
8.5.2. Prion Diseases

8.6. Main Small Ruminant Infectious and Contagious Diseases I
8.6.1. Notifiable Diseases
8.6.2. Bacterial Diseases
8.6.3. Fungal Diseases

8.7. Main Small Ruminant Infectious and Contagious Diseases II
8.7.1. Viral Diseases
8.7.2. Prion Diseases

8.8. Main Parasites Affecting Bovines
8.8.1. Hemoparasites
8.8.2. Gastrointestinal Nematodes
8.8.3. Nematodes Affecting the Respiratory Tract
8.8.4. Cestodes
8.8.5. Trematodes
8.8.6. Coccidia

8.9. Main Parasites Affecting Small Ruminants
8.9.1. Hemoparasites
8.9.2. Gastrointestinal Nematodes
8.9.3. Nematodes Affecting the Respiratory Tract
8.9.4. Cestodes
8.9.5. Trematodes
8.9.6. Anthelmintic Resistance in Small Ruminants
8.9.7. Management, Treatment and Control Programs (FAMACHA)

8.10. Prevention and Treatment of Parasitic Diseases
8.10.1. Diagnostic Techniques
8.10.2. Therapeutic Principles
8.10.2. Resistance Development
8.10.3. Management and Control Programs

Module 9. Soft Tissue Surgery

9.1. The Surgery. Pre-Operative, Field Preparation, Surgeon Preparation
9.1.1. Pre-Surgery Planning
9.1.2. Surgical Attire, Preparation of Surgical Equipment: Gloves, Gowns etc.
9.1.3. Preparation of the Patient and Surgical Area

9.2. Surgery of the Pre-Stomachs. Peritonitis
9.2.1. Surgical Physiology and Anatomy
9.2.2. Pathology and Clinical Signs
9.2.3. Surgical Techniques
9.2.3.1. Left Flank Laparotomy
9.2.3.2. Ruminotomy

9.2.4. Perioperative Management
9.2.5. Peritonitis
9.3. Abomasal Surgery. Laparoscopy
9.3.1. Pathogenesis of Abomasal Displacements
9.3.2. Types of Abomasal Displacements
9.3.2.1. Left Displacement of the Abomasum
9.3.2.2. Dilatation/Displacement of the Right Abomasum
9.3.2.2.1. Volvulus of the Right Side of the Abomasum
9.3.3. Clinical Introduction and Diagnosis
9.3.4. Management of Abomasal Displacements
9.3.4.1. Physical Methods
9.3.4.2. Medical Therapy
9.3.4.3. Surgical Techniques
9.3.4.4. Right Flank Omentopexy
9.3.4.5. Right Flank Pyloropexy
9.3.4.6. Left Flank Abomasopexy
9.3.4.7. Right Median Abomasopexy

Module 10. Musculoskeletal System Surgery

10.1. Hoof Anatomy and Biomechanics Functional Trimming
10.1.1. Hoof Anatomy and Biomechanics
10.1.1.1. Anatomical Structure. Key Structures
10.1.1.2. Hoof
10.1.1.2.1. Corium
10.1.1.2.2. Other Structures
10.1.1.3. Biomechanics
10.1.1.3.1. Concept
10.1.1.3.2. Hind Limb Biomechanics
10.1.1.3.3. Forelimb Biomechanics
10.1.1.4. Factors that Affect Biomechanics
10.1.2. Functional Trimming
10.1.2.1. Concept and Importance of Functional Trimming
10.1.2.2. Trimming Technique. Dutch Model
10.1.2.3. Other Trimming Techniques
10.1.2.4. Containment and Instrumentation
10.2. Hoof Diseases I. Infectious Origin: Digital Dermatitis. Interdigital Dermatitis. Interdigital Phlegmon
10.2.1. Digital Dermatitis
10.2.1.1. Etiology
10.2.1.2. Clinical Signs
10.2.1.3. Control
10.2.1.4. Treatment
10.2.2. Interdigital Dermatitis
10.2.2.1. Etiology
10.2.2.2. Clinical Signs
10.2.2.3. Control
10.2.2.4. Treatment
10.2.3. Interdigital Phlegmon
10.2.3.1. Etiology
10.2.3.2. Clinical Signs
10.2.3.3. Control
10.2.3.4. Treatment
10.2.4. Use of Footbath for the Control of Environmental Diseases
10.2.4.1. Design
10.2.4.2. Products
10.3. Hoof Diseases II. Non-Infectious Origin: Sole Ulcer. White Line Disease. Point Ulcers and Others
10.3.1. Sole Ulcers
10.3.1.1. Etiopathogenesis
10.3.1.2. Control
10.3.1.3. Treatment

10.3.2. White Line Disease
10.3.2.1. Etiopathogenesis
10.3.2.2. Control
10.3.2.3. Treatment
10.3.3. Other Diseases of Non-Infectious Origin
10.3.3.1. Hyperconsumption or Thin Sole
10.3.3.2. Point Ulcers
10.3.3.3. Ring-Shaped Hooves

10.4. Surgical Treatment of Septic Processes of the Distal Limb (Finger Amputation, Distal and Proximal Interphalangeal Joint Ankylosis)
10.4.1. Etiology of Septic Processes of the Distal Limb
10.4.2. Diagnosis
10.4.2.1. Clinical Presentation
10.4.2.2. Diagnostic Imaging
10.4.2.3. Clinical Pathology
10.4.3. Indications for Distal Limb Surgery
10.4.4. Surgical Preparation
10.4.5. Treatment in Acute Septic Processes
10.4.5.1. Joint Lavage
10.4.5.2. Systemic Antibiotics
10.4.6. Surgical Treatment in Chronic Septic Processes
10.4.6.1. Amputation of the Digit
10.4.6.2. Arthrodesis/Facilitated Ankylosis
10.4.6.2.1. Solar Approach
10.4.6.2.2. Bulbar Approach
10.4.6.2.3. Dorsal Approach
10.4.6.2.3.1. Abaxial Approach
10.4.6.2.3.2. Prognosis

10.5. Examination of Lameness. Diagnosis and Prognosis of Proximal Limb Injuries
10.5.1. Examination of Lameness
10.5.2. Diagnostic Tests
10.5.2.1. Synovial Fluid
10.5.2.2. Radiographic Diagnosis
10.5.2.3. Ultrasound Diagnosis
10.5.3. Diagnosis and Prognosis of Proximal Limb Injuries

10.6. Cranial Cruciate Ligament Rupture. Upward Patella Fixation. Coxofemoral Dislocation. Femoral Neck Fracture
10.6.1. Cranial Cruciate Ligament Damage
10.6.1.1. Imbrication of Patella
10.6.1.2. Cranial Cruciate Ligament Replacement
10.6.1.2.1. Gluteobiceps Replacement
10.6.1.2.2. Synthetic Ligament
10.6.1.3. Postoperative Care and Prognosis
10.6.2. Coxofemoral Dislocation
10.6.3. Dorsal Dislocation of Patella
10.6.4. Fracture of the Femoral Neck and Head
10.6.4.1. Clinical Signs
10.6.4.2. Surgical Approach
10.6.4.3. Surgical Techniques
10.6.4.4. Femoral Head Ostectomy
10.6.4.5. Post-Operative Management and Complications

10.7. Management of Septic Arthritis. Septic Tenosynovitis. Arthroscopy. Osteochondrosis Osteoarthritis
10.7.1. Etiology
10.7.2. Diagnosis
10.7.3. Medical and Surgical Treatment
10.7.4. Prognosis
10.7.5. Complications, Osteomyelitis
10.7.6. Other Joint Pathologies
10.7.6.1. Osteochondrosis in Fattening Calves
10.7.6.2. Poly and Oligoarthrosis

10.8. Tendon Surgery: Hyperextension, Flexural Deformities, Arthrogryposis, Lacerations Spastic Paresis
10.8.1. Tendon Lacerations Management and Repair
10.8.1.1. Diagnosis
10.8.1.2. Tendon Avulsion and Rupture
10.8.1.3. Treatment
10.8.2. Hyperextension
10.8.2.1. Diagnosis
10.8.2.2. Treatment

10.8.3. Flexural Deformities
10.8.3.1. Types
10.8.3.2. Diagnosis
10.8.3.3. Treatment
10.8.4. Arthrogryposis
10.8.4.1. Diagnosis
10.8.4.2. Treatment
10.8.5. Spastic Paresis
10.8.5.1. Diagnosis
10.8.5.2. Treatment
10.9 Emergency Treatment of Fractures. Principles of Fracture Repair
10.9.1. Introduction to Fracture Management in Cattle
10.9.2. Emergency Treatment
10.9.3. Diagnostic Imaging
10.9.4. Principles of Fracture Management
10.9.4.1. Hoof Blocks
10.9.4.2. Plaster
10.9.4.3. Thomas Splint (Thomas Schroder Splint)
10.9.4.4. External Fixators
10.9.5. Thomas Splint
10.9.5.1. Application
10.9.5.2. Practical Advice
10.9.5.3. Complications
10.9.6. Guidelines for Use of External Fixation in Long Bone Fractures
10.9.6.1. Advantages
10.9.6.2. Disadvantages
10.9.6.3. Types of External Fixators
10.9.7. Transfixion Plasters
10.9.7.1. Application
10.9.7.2. Practical Considerations in Bovines
10.9.8. Complications Associated with External Fixators
10.10. Resolution of Specific Fractures: Decision Making and Guidance for External Skeletal Fixation. Plasters and Plasters with Transfixing Pins. Plates, Intramedullary Nails and Locking Nails
10.10.1. Resolution of Specific Fractures
10.10.1.1. External Coaptation
10.10.1.2. Placement of Acrylic Casts
10.10.1.3. Complications of Acrylic Casts
10.10.1.4. Removal of Acrylic Casts
10.10.1.5. External Fixators
10.10.1.6. Indications
10.10.1.7. Biomechanics of External Fixators
10.10.1.8. External Fixators
10.10.1.9. Application
10.10.1.10. Post-Positioning Care
10.10.1.11. Complications
10.10.1.12. Removal of External Fixator
10.10.1.13. Acrylic Frames
10.10.1.14. Transfixion Casts
10.10.1.15. Implants
10.10.1.16. Plates
10.10.1.17. Screws
10.10.1.18. Intramedullary Nails
10.10.1.19. Locked Nails
10.10.1.20. Internal Fixation Complications
10.10.1.20.1. Infections
10.10.2. Failure or Migration
10.10.3. Prognosis

06

Methodology

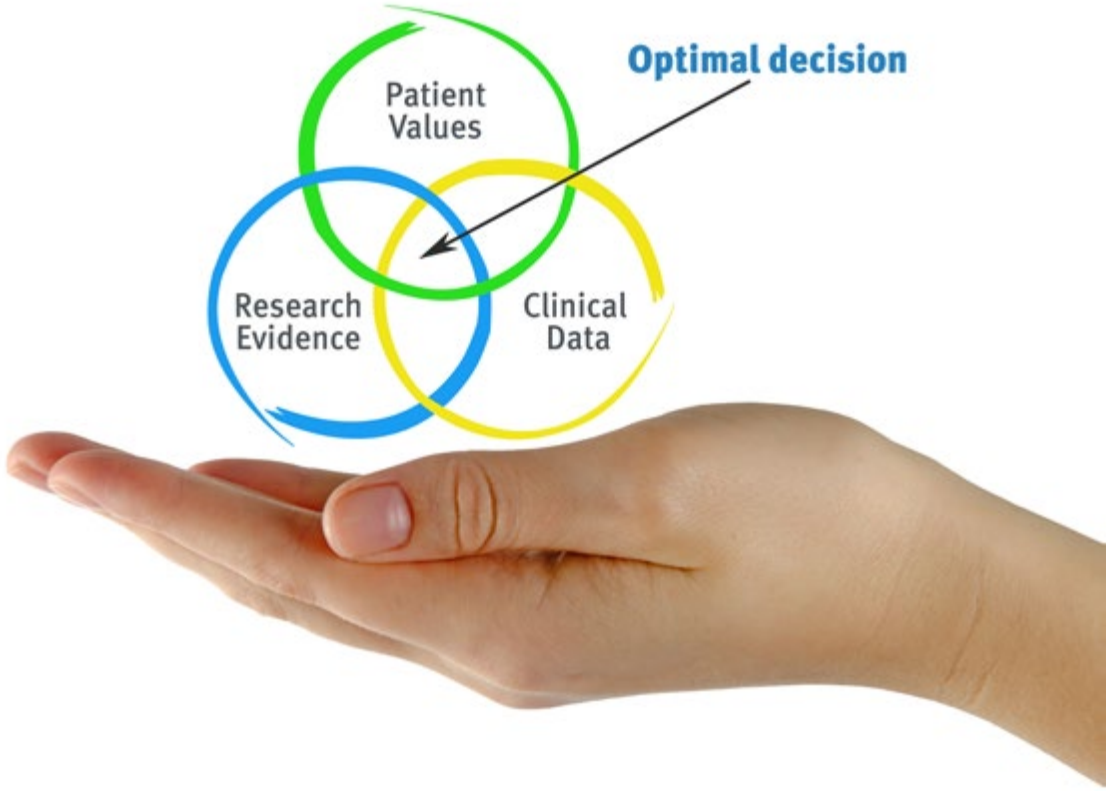
This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program you will be presented with multiple simulated clinical cases based on real patients, where you will have to investigate, establish hypotheses and, finally, resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, in an attempt to recreate the actual conditions in a veterinarian's professional practice.

Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method"

The effectiveness of the method is justified by four fundamental achievements:

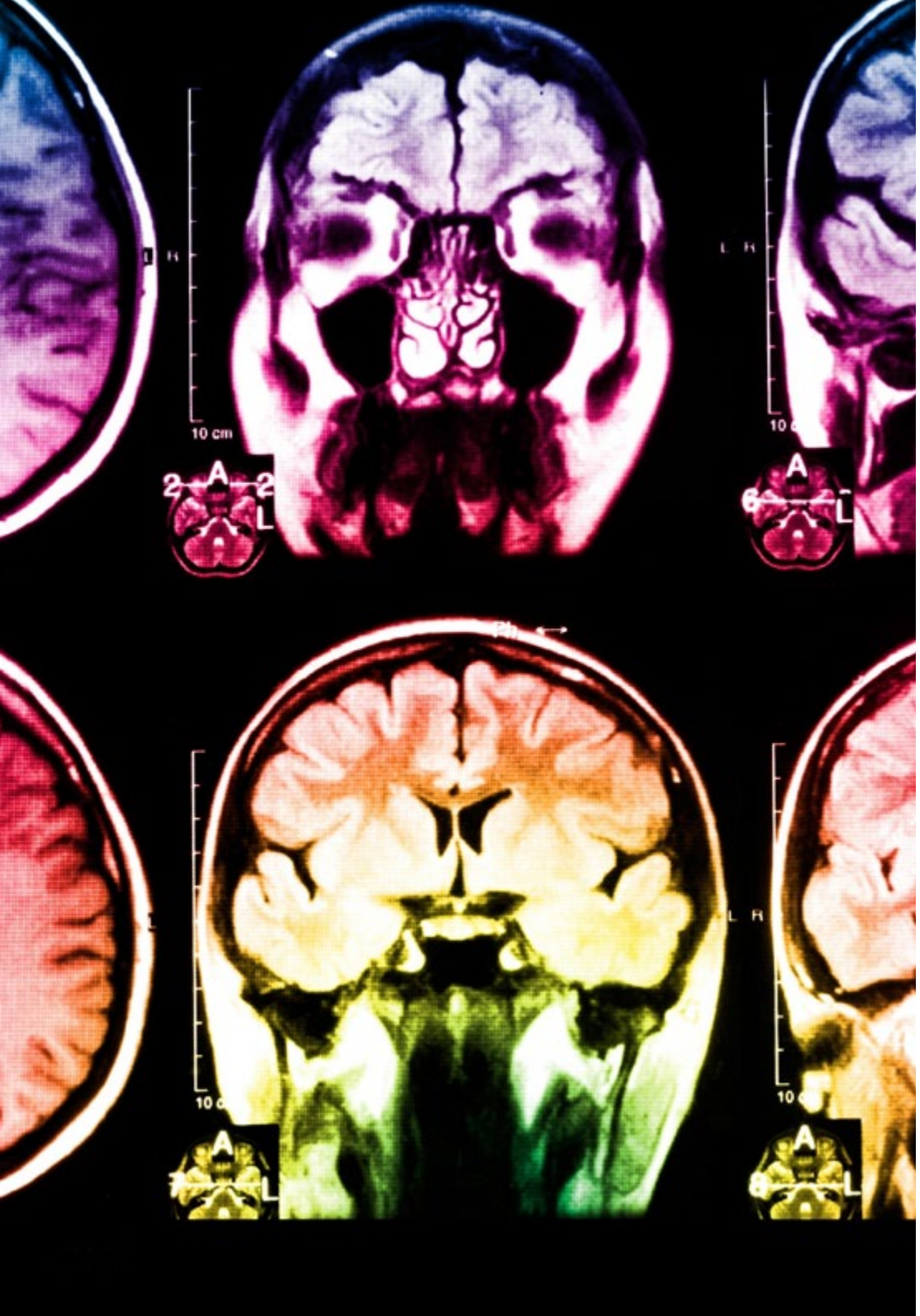
1. Veterinarians who follow this method not only manage to assimilate concepts, but also develop their mental capacity through exercises to evaluate real situations and knowledge application
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. The feeling that the effort invested is effective becomes a very important motivation for veterinarians, which translates into a greater interest in learning and an increase in the time dedicated to working on the course.

Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

Veterinarians will learn through real cases and by resolving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology more than 65,000 veterinarians have been trained with unprecedented success in all clinical specialties, regardless of the surgical load. Our teaching method is developed in a highly demanding environment, where the students have a high socio-economic profile and an average age of 43.5 years.

Relearning will allow you to learn with less effort and better performance, involving you more in your learning, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and relearn). Therefore, we combine each of these elements concentrically.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.

This program offers the best educational material, prepared with professionals in mind:

Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.

Latest Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current and procedures of veterinary techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.

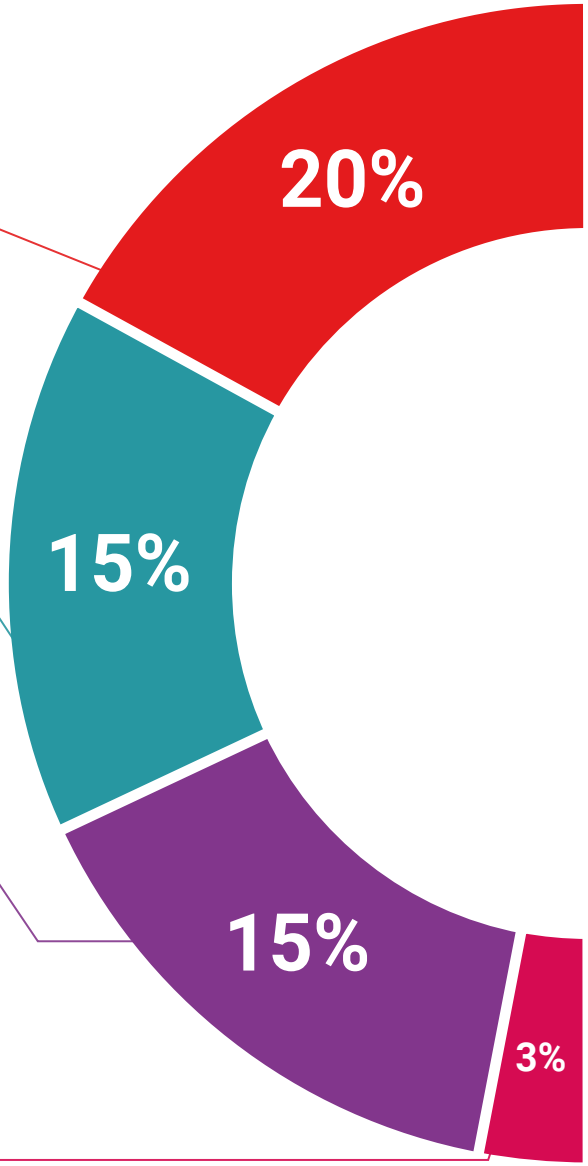
Interactive Summaries

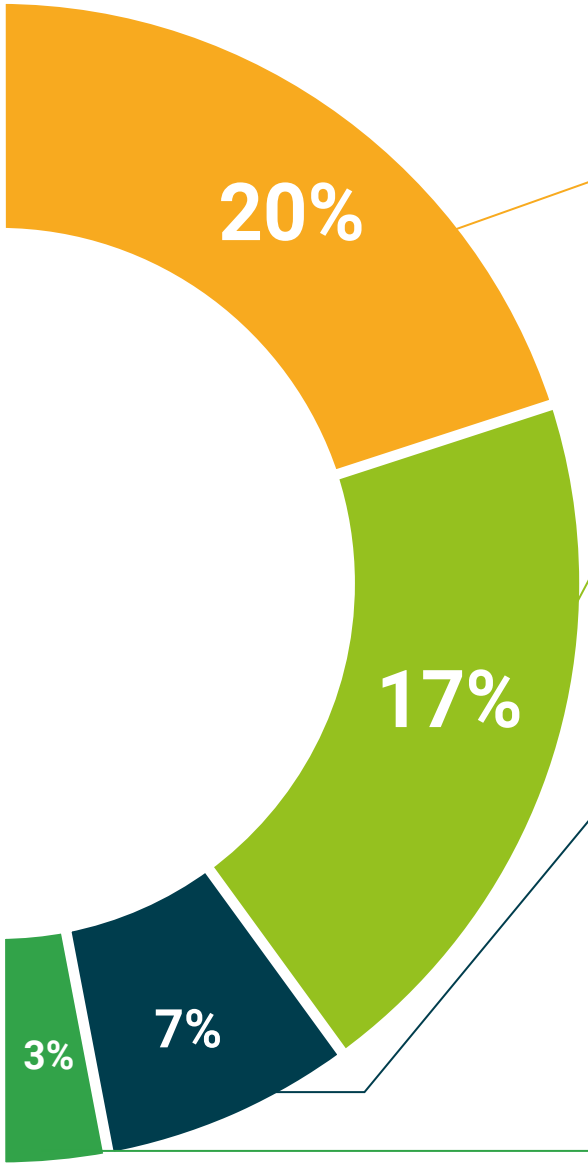
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.

Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.

Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.

07

Certificate

The Master's Degree in Ruminant Medicine and Surgery guarantees students, in addition to the most rigorous and up-to-date education, access to a Master's Degree issued by TECH Global University.

Successfully complete this program and receive your university degree without travel or laborious paperwork”

This program will allow you to obtain your **Master's Degree diploma in Ruminant Medicine and Surgery** endorsed by **TECH Global University,** the world's largest online university.

TECH Global University is an official European University publicly recognized by the Government of Andorra (***official bulletin***). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Master's Degree in Ruminant Medicine and Surgery**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**

tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Master's Degree in Ruminant Medicine and Surgery

This is a program of 1,500 hours of duration equivalent to 60 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

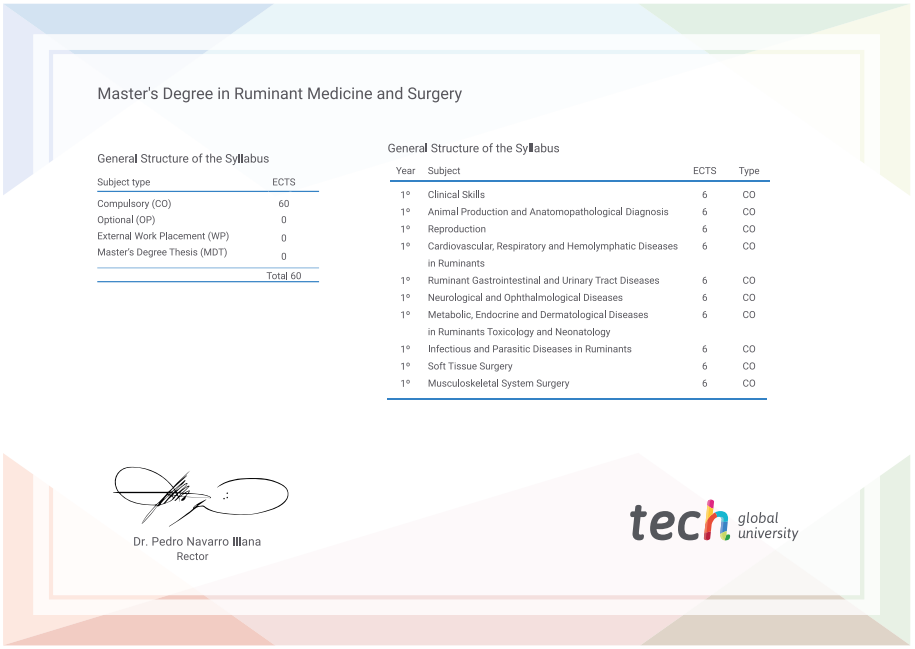
TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.

Unique TECH Code: AFWORD23S techtitute.com/certificates


Master's Degree in Ruminant Medicine and Surgery

General Structure of the Syllabus

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
	Total 60

General Structure of the Syllabus

Year	Subject	ECTS	Type
1°	Clinical Skills	6	CO
1°	Animal Production and Anatomopathological Diagnosis	6	CO
1°	Reproduction	6	CO
1°	Cardiovascular, Respiratory and Hemolymphatic Diseases in Ruminants	6	CO
1°	Ruminant Gastrointestinal and Urinary Tract Diseases	6	CO
1°	Neurological and Ophthalmological Diseases	6	CO
1°	Metabolic, Endocrine and Dermatological Diseases in Ruminants Toxicology and Neonatology	6	CO
1°	Infectious and Parasitic Diseases in Ruminants	6	CO
1°	Soft Tissue Surgery	6	CO
1°	Musculoskeletal System Surgery	6	CO

Dr. Pedro Navarro Illana
Rector

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*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

tech global university

Master's Degree
Ruminant Medicine and Surgery

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Master's Degree
Ruminant Medicine and Surgery

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