

**Postgraduate Diploma**  
Ruminant Cardiorespiratory,  
Gastrointestinal and Urinary Diseases





## Postgraduate Diploma Ruminant Cardiorespiratory, Gastrointestinal and Urinary Diseases

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Global University
- » Credits: 18 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/veterinary-medicine/postgraduate-diploma/postgraduate-diploma-ruminant-cardiorespiratory-gastrointestinal-urinary-diseases](http://www.techtute.com/us/veterinary-medicine/postgraduate-diploma/postgraduate-diploma-ruminant-cardiorespiratory-gastrointestinal-urinary-diseases)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Course Management

---

*p. 12*

04

Structure and Content

---

*p. 18*

05

Methodology

---

*p. 28*

06

Certificate

---

*p. 36*

# 01

# Introduction

In the veterinary field, specialization in ruminants is a relevant step towards differentiation in the sector. As opposed to individual clinical actions, the specific work in ruminants focuses on collective work, approaching diagnosis through herd investigation, diagnostic methods and clinical reasoning. This program will focus on learning about these developments in cardiorespiratory, gastrointestinal and urinary diseases.





“

*The most complete and up-to-date knowledge in Ruminant Cardiorespiratory, Gastrointestinal and Urinary Diseases, in a practical and real program that makes the difference"*

Ruminant Cardiorespiratory, Gastrointestinal and Urinary Diseases are highly variable, even in cases that initially appear to be mild, it is common to see rapid deterioration of the individual, marked decrease in production and, in the case of infectious-contagious problems, which occupy the first place among respiratory diseases, the possibility of contagion and group affectation, with substantial losses for the producer.

Consequently, the rapid recognition of the main diseases affecting the respiratory tract, the cardiovascular system and the lymphatic system must be intervened in a timely manner, in order to allow early diagnosis and the implementation of control and treatment measures for affected animals, as well as to prevent transmission to other animals (in the case of livestock herds), seeking to minimize losses and restore the health of affected individuals and the entire farm.

Additionally, the causes of diarrhea in bovines, which also represent a very common pathology, as well as its diagnosis and treatment, examination and main pathologies of the digestive tract of small ruminants will be discussed. In-depth knowledge of these disorders is essential for the ruminant veterinarian to be able to diagnose, treat and prevent them in the individual and in the rest of the farm.

Likewise, this Postgraduate Diploma covers specific genitourinary diseases in bovines and small ruminants; some of them relatively frequent in the veterinarian's clinic of these species, such as urinary obstruction in male goats. The knowledge acquired in this program specializes the veterinarians in the diagnosis, treatment and prevention of these alterations, which are fundamental for their daily practice.

This **Postraduate Diploma in Ruminant Cardiorespiratory, Gastrointestinal and Urinary Diseases** contains the most complete and up-to-date scientific program on the market.

The most important features 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
- » Practical cases presented by practising 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-assessment 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
- » Supplementary documentation databases are permanently available, even after the program



*Essential yet rare training for the specialist veterinary clinician that will set you apart as a specialist in this field of work"*

“

*With the experience of working professionals and the analysis of real success stories, in a high-impact training”*

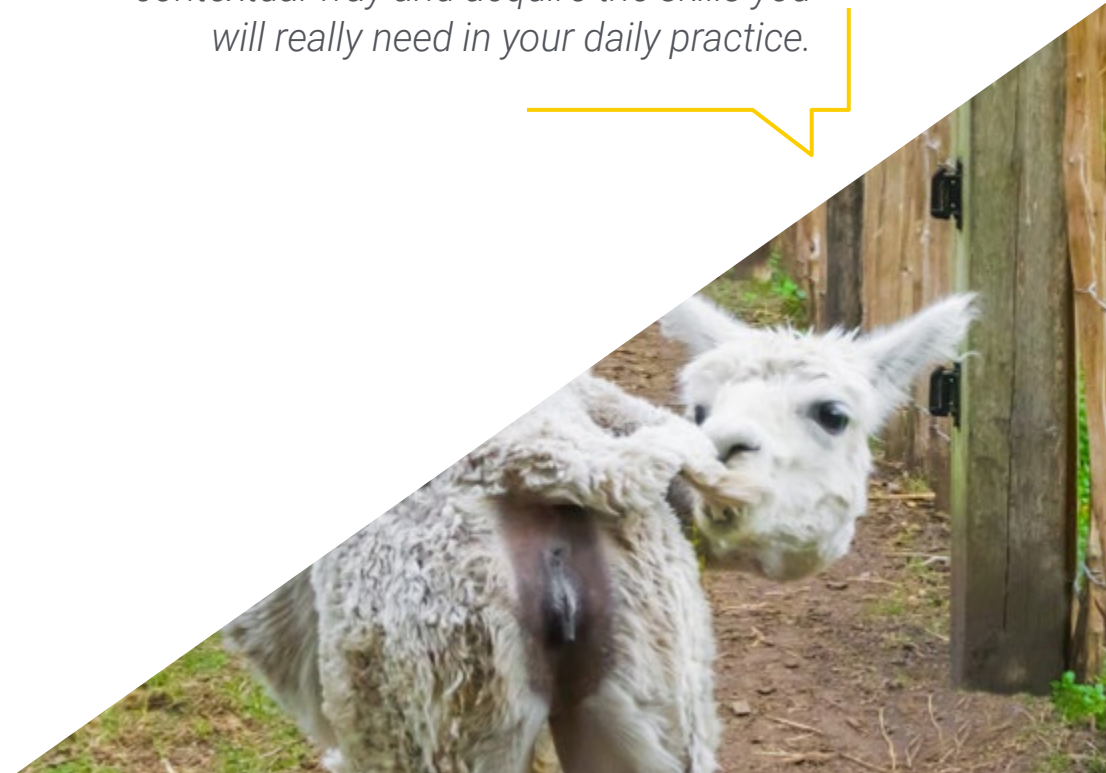
Our teaching staff is made up of professionals from different fields related to this specialty. In this way, TECH makes sure to offer professionals the up-to-date objective it intends. A multidisciplinary team of professionals trained and experienced in different environments who will develop theoretical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

This mastery of the subject is complemented by the effectiveness of the methodological design. 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.

The design of this program is based on Problem-Based Learning: an approach that conceives learning as a highly practical process. To achieve this remotely telepractice will be used: 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 facing the case you are learning at that moment. A concept that will make it possible to integrate and fix learning in a more realistic and permanent way.

*The clinical, specialized and advanced fundamentals, based on veterinary evidence, that will allow you to face the daily intervention in cattle and ruminants.*

*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

The completion of this Postgraduate Diploma provides the veterinary professional with specialized and advanced clinical fundamentals, based on evidence to face the daily clinical practice in cattle and ruminants.

Additionally, to this up-to-date approach to the problems encountered in daily clinical practice, the bibliography provided and the structuring of the topics will allow you to keep this knowledge up to date.







“

*The Postgraduate Diploma in Ruminant Cardiorespiratory, Gastrointestinal and Urinary Diseases will allow veterinary clinicians to update and expand their skills with the quality of the largest online university in the world"*



## General Objectives

---

- » 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
- » 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 repercussion 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





## Specific Objectives

---

### Module 1. Cardiovascular, Respiratory and Hemolymphatic Diseases in Ruminants

- » Examine 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 2. Ruminant Gastrointestinal and Urinary Tract Diseases

- » Recognize the clinical signs of the main pathologies affecting the gastrointestinal system of ruminants
- » Study 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 3. 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

03

# 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.





“

*Leading professionals in the field have come together to offer you the most comprehensive knowledge in this field, so that you can develop with total guarantees of success”*

## Management



### **Dr. Ezquerra Calvo, Luis Javier**

- PhD in Veterinary Medicine from the University of Extremadura
- Degree in Veterinary 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 of the European College of Veterinary Surgeons in Large Animals
- Presents 6 five-year teacher evaluation periods



## Professors

### 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's Degree 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 Herpesvirus 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. Galapero Arroyo, Javier

- » External advisor to national companies in the Agro-Livestock sector
- » PhD and degree 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)

**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 Equids); Specialty in Equids. 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 Balcarce 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

**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. 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 Large Animal Clinic Los Molinos
- » 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. 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

# 04

# Structure and Content

The contents have been developed by the different experts of this Postgraduate Diploma with a clear purpose: to ensure that students acquire each and every one of the skills necessary 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. Cardiovascular, Respiratory and Hemolymphatic Diseases in Ruminants

- 1.1. Interpretation of Blood Tests in Bovines
  - 1.1.1. Blood Count:
  - 1.1.2. Blood Biochemistry
  - 1.1.3. Urinalysis
  - 1.1.4. Bone Marrow
- 1.2. Interpretation of Blood Tests in Small Ruminant
  - 1.2.1. Blood Count:
  - 1.2.2. Blood Biochemistry
- 1.3. Immunological and Hematopoietic Disorders in Cattle and Small Ruminants
  - 1.3.1. Immune-Mediated Anemia
  - 1.3.2. Anemia and the FAMACHA System
  - 1.3.3. Thrombocytopenia
  - 1.3.4. Bone Marrow Suppression
- 1.4. Cardiovascular Diseases in Cattle
  - 1.4.1. Cardiovascular System Examination in Bovines
  - 1.4.2. Congenital Cardiovascular Pathologies
  - 1.4.3. Arrhythmias
  - 1.4.4. Heart Failure and Cor Pulmonale
  - 1.4.5. Valvular and Endocardial Diseases
  - 1.4.6. Myocardial Diseases and Cardiomyopathies
  - 1.4.7. Pericardial Diseases
  - 1.4.8. Thrombosis and Embolism
  - 1.4.9. Neoplasty
- 1.5. Cardiovascular Diseases in Small Ruminants
  - 1.5.1. Cardiovascular System Examination in Small Ruminants
  - 1.5.2. Congenital Cardiovascular Pathologies
  - 1.5.3. Acquired Cardiovascular Pathologies
  - 1.5.4. Toxic or Nutritional Deficiency Cardiopathies
  - 1.5.5. Vascular Diseases



- 1.6. Examination of the Respiratory Tract and Diagnostic Tests in Ruminants
  - 1.6.1. Anatomy and Physiology of the Respiratory Tract
  - 1.6.2. Characteristic Clinical Signs of Respiratory Tract Disturbances
  - 1.6.3. Physical Examination
    - 1.6.3.1. History
    - 1.6.3.2. General Physical Evaluation
    - 1.6.3.3. Examination of the Respiratory Tract
  - 1.6.4. Diagnostic Imaging Techniques
    - 1.6.4.1. Radiography
    - 1.6.4.2. Ultrasound
    - 1.6.4.3. Others Diagnostic Imaging Techniques
  - 1.6.5. Collection and Assessment of Respiratory Secretions
    - 1.6.5.1. Tracheal Aspirate and Bronchoalveolar Lavage
    - 1.6.5.2. Thoracentesis
- 1.7. Pathologies Affecting the Upper Respiratory Tract of Bovines
  - 1.7.1. Nasal Cavity Diseases
    - 1.7.1.1. Bacterial or Mycotic Nasal Granuloma
    - 1.7.1.2. Allergic Rhinitis and Enzootic Nasal Granuloma
    - 1.7.1.3. Nasal Foreign Bodies
    - 1.7.1.4. Fractures
    - 1.7.1.5. Tumors and Polyps
    - 1.7.1.6. Congenital Problems
  - 1.7.2. Sinus Diseases
    - 1.7.2.1. Sinusitis
  - 1.7.3. Diseases of the Pharynx, Larynx and Trachea
    - 1.7.3.1. Alterations of Pharynx
    - 1.7.3.2. Necrotic Laryngitis or Necrobacillosis
    - 1.7.3.3. Other Laryngeal Disorders
    - 1.7.3.4. Tracheal Disorders

- 1.8. Bovine Respiratory Syndrome (BRS)
  - 1.8.1. BRS Overview
  - 1.8.2. Factors Involved in the Development of BRS
  - 1.8.3. Main Pathogens Involved in BRS
    - 1.8.3.1. Viruses Involved in BRS
    - 1.8.3.2. Bacteria Involved in BRS
- 1.9. Other Causes of Pneumonia and Thoracic Disease in Bovines
  - 1.9.1. Bovine Interstitial Pneumonia
  - 1.9.2. Metastatic Pneumonia due to Thrombosis of the Cava Vein
  - 1.9.3. Aspiration Pneumonia
  - 1.9.4. Fungal Pneumonia
  - 1.9.5. Bovine Tuberculosis
  - 1.9.6. Other Thoracic Cavity Disorders
- 1.10. Small Ruminant Respiratory Pathologies
  - 1.10.1. Examination of the Respiratory System in Sheep and Goats
  - 1.10.2. Upper Respiratory Tract Disorders
  - 1.10.3. Pneumonia
  - 1.10.4. Thoracic Cavity Disorders

## Module 2. Ruminants Gastrointestinal and Urinary Tract Diseases

- 2.1. Examination of the Gastrointestinal Tract and Diagnostic Tests in Bovines
  - 2.1.1. Anatomy and Physiology of the Gastrointestinal Tract
  - 2.1.2. Characteristic Clinical Signs of Gastrointestinal Tract Disorders
  - 2.1.3. Physical Examination
    - 2.1.3.1. History
    - 2.1.3.2. General Physical Evaluation
    - 2.1.3.3. Examination of the Gastrointestinal Tract
  - 2.1.4. Diagnostic Imaging Techniques
    - 2.1.4.1. Radiography
    - 2.1.4.2. Ultrasound
    - 2.1.4.3. Others Diagnostic Imaging Techniques

- 2.1.5. Other Diagnostic Techniques
  - 2.1.5.1. Rumen Fluid Analysis
  - 2.1.5.2. Macroscopic Stool Examination
  - 2.1.5.3. Laparotomy or Exploratory Rumenotomy
- 2.2. Disorders of the Oral Cavity in Bovines
  - 2.2.1. Dental and Salivary Gland Disorders
  - 2.2.2. Actinobacillosis ("Wooden Tongue")
  - 2.2.3. Actinomycosis ("Rubber Jaw")
  - 2.2.4. Oral Necrobacillosis
  - 2.2.5. Viruses Causing Mucosal Lesions
    - 2.2.5.1. Bluetongue
    - 2.2.5.2. Bovine Papular Stomatitis
    - 2.2.5.3. Vesicular Stomatitis
    - 2.2.5.4. Bovine Viral Diarrhea Virus (BVDV)
    - 2.2.5.5. Malignant Catarrhal Fever
    - 2.2.5.6. Foot and Mouth Disease
    - 2.2.5.7. Rinderpest
- 2.3. Indigestions and Traumatic Reticuloperitonitis in Bovines
  - 2.3.1. Primary Indigestions
    - 2.3.1.1. Rumen Wall or Reticuloruminal Motor Disorders
      - 2.3.1.1.1. Traumatic Reticuloperitonitis
      - 2.3.1.1.2. Foamy Tympanism
      - 2.3.1.1.3. Gaseous Tympanism
      - 2.3.1.1.4. Reticulitis or Rumenitis
      - 2.3.1.1.5. Rumen Parakeratosis
      - 2.3.1.1.6. Vagal Indigestion
      - 2.3.1.1.7. Cardiac Obstruction
      - 2.3.1.1.8. Reticuloomasal Orifice Obstruction
      - 2.3.1.1.9. Diaphragmatic Hernia
    - 2.3.1.2. Reticuloruminal Fermentative Disorders
      - 2.3.1.2.1. Inactivity of Ruminal Microbial Flora
      - 2.3.1.2.2. Simple Indigestion
      - 2.3.1.2.3. Ruminal Acidosis
      - 2.3.1.2.4. Ruminal Alkalosis
      - 2.3.1.2.5. Putrefaction of Ruminal Intake
  - 2.3.2. Secondary Indigestions
    - 2.3.2.1. Indigestions Secondary to Reticuloruminal Motor Inactivity
    - 2.3.2.2. Indigestions Secondary to Reticuloruminal Microflora Inactivity
    - 2.3.2.3. Abomasal Reflux
- 2.4. Abomasal Displacements and Other Abomasal Displacements in Bovines
  - 2.4.1. Left Displacement of the Abomasum
  - 2.4.2. Right Displacement of the Abomasum
  - 2.4.3. Abomasal Torsion
  - 2.4.4. Abomasal Ulcers
  - 2.4.5. Abomasal Impaction
- 2.5. Obstructive Intestinal Disorders in Bovines
  - 2.5.1. General Aspects
  - 2.5.2. Intradigestive Mechanical Causes of Intestinal Obstruction
    - 2.5.2.1. Congenital
    - 2.5.2.2. Intestinal Intussusception
    - 2.5.2.5. Intestinal Volvulus
    - 2.5.2.4. Cecal Dilatation and Volvulus
    - 2.5.2.5. Neoplasty
    - 2.5.2.6. Rectal Prolapse
  - 2.5.3. Extradigestive Mechanical Causes of Intestinal Obstruction
    - 2.5.3.1. Mesenteric Fat Necrosis
    - 2.5.3.2. Fibrous Adhesions
    - 2.5.3.3. Hernias
  - 2.5.4. Other Causes of Intestinal Obstruction
    - 2.5.4.1. Intraluminal Obstruction
    - 2.5.4.2. Jejunal Hemorrhagic Syndrome

- 2.6. Bovine Diarrhea
  - 2.6.1. Bacterial Diarrhea
    - 2.6.1.1. Paratuberculosis
    - 2.6.1.2. Salmonella
    - 2.6.1.3. Clostridiosis
  - 2.6.2. Viral Diarrhea
    - 2.6.2.1. Bovine Viral Diarrhea Virus (BVDV)
    - 2.6.2.2. Coronavirus
    - 2.6.2.3. Other Viruses
  - 2.6.3. Parasite Diarrhea
  - 2.6.4. Diarrhea Caused by Poisoning
  - 2.6.5. Other Causes of Diarrhea
- 2.7. Small Ruminant Gastrointestinal Tract Examinations and Diagnostic Tests
  - 2.7.1. Anatomy and Physiology of the Gastrointestinal Tract
  - 2.7.2. Characteristic Clinical Signs of Gastrointestinal Tract Disorders
  - 2.7.3. Physical Examination
    - 2.7.3.1. History
    - 2.7.3.2. General Physical Evaluation
    - 2.7.3.3. Gastrointestinal Tract Examination
  - 2.7.4. Diagnostic Imaging Techniques
    - 2.7.4.1. Radiography
    - 2.7.4.2. Ultrasound
    - 2.7.4.3. Others Diagnostic Imaging Techniques
  - 2.7.5. Other Diagnostic Techniques
    - 2.7.5.1. Rumen Fluid Analysis
    - 2.7.5.2. Macroscopic Stool Examination
    - 2.7.5.3. Laparotomy or Exploratory Rumenotomy
- 2.8. Gastrointestinal Disorders of Small Ruminants
  - 2.8.1. Disorders of the Oral Cavity
  - 2.8.2. Indigestion and Other Pre-stomach Disorders
  - 2.8.3. Enterotoxemia
  - 2.8.4. Diarrhea in Adult Sheep and Goats

- 2.9. Bovine Urinary Diseases
  - 2.9.1. Congenital Genitourinary Pathologies
  - 2.9.2. Renal Damage and Failure
  - 2.9.3. Other Kidney Diseases
  - 2.9.4. Diseases of the Ureters, Bladder and Urethra
- 2.10. Urinary Diseases in Small Ruminants
  - 2.10.1. Congenital Genitourinary Pathologies
  - 2.10.2. Renal Damage and Failure
  - 2.10.3. Other Kidney Diseases
  - 2.10.4. Urinary Obstruction.
  - 2.10.5. Diseases of the Ureters, Bladder and Urethra

### Module 3. Clinical Skills

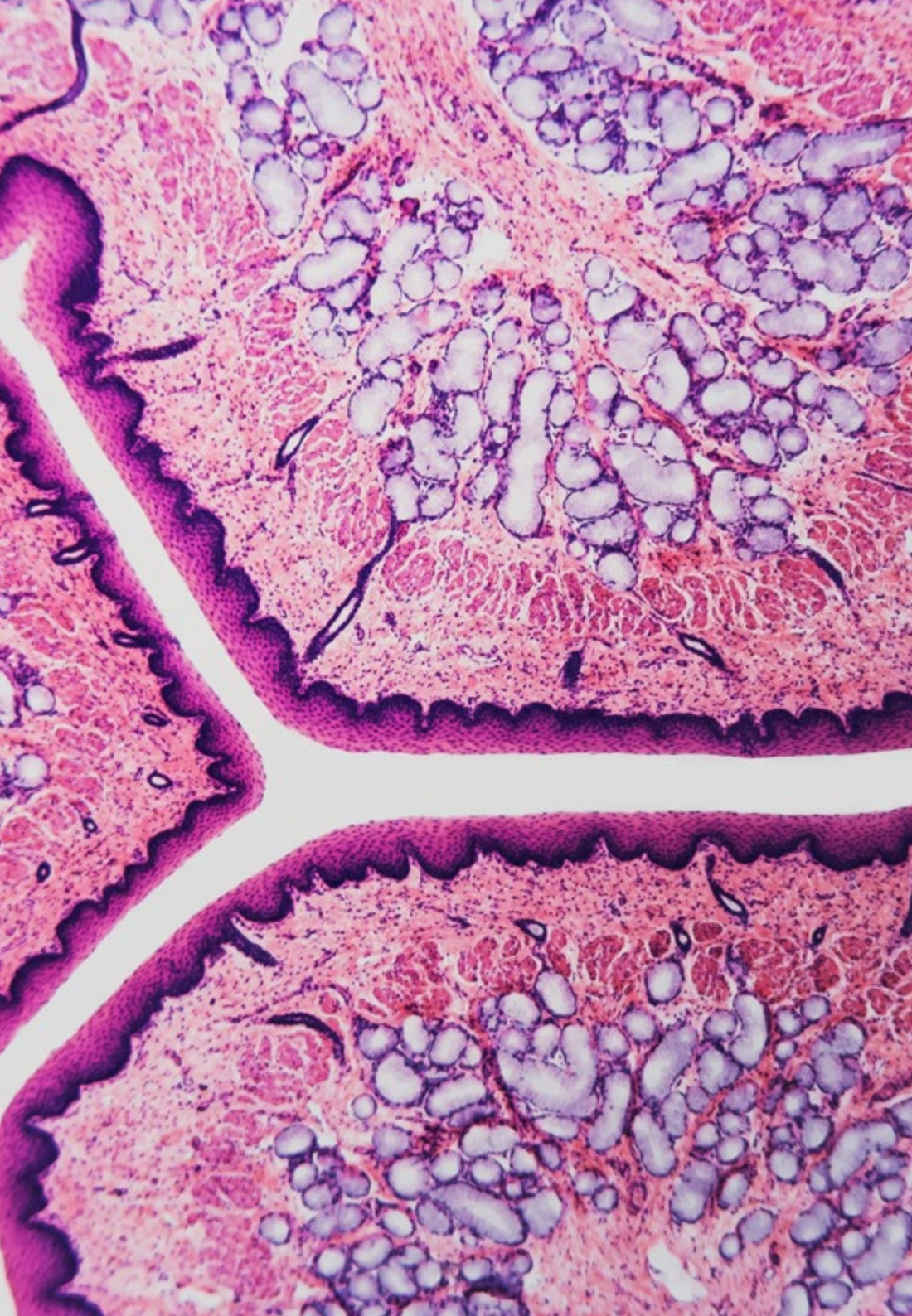
- 3.1. Handling and Restraint of Cattle
  - 3.1.1. Introduction
  - 3.1.2. Physical Immobilization Methods
    - 3.1.2.1. Head
    - 3.1.2.2. Limbs
    - 3.1.2.3. Immobilization Devices
  - 3.1.3. Animal Takedown
    - 3.1.3.1. Takedown Systems
    - 3.1.3.2. Handling in Decubitus Position
- 3.2. Veterinary Equipment in Field Clinics
  - 3.2.1. Introduction
  - 3.2.2. Examination Material
  - 3.2.3. Surgical Material
  - 3.2.4. Obstetrical Material
    - 3.2.4.1. Childbirth
    - 3.2.4.2. Insemination
    - 3.2.4.3. Breeder Assessment

- 3.2.5. Sample Extraction Material
- 3.2.6. Drug Administration Material
- 3.2.7. Fluid Therapy Material
- 3.2.8. Medication
  - 3.2.8.1. Antibiotic Therapy
  - 3.2.8.2. Anti-Inflammatories
  - 3.2.8.3. Hormonal
  - 3.2.8.4. Metabolic and Vitamin
  - 3.2.8.5. Antiparasitics II
- 3.3. Herd Health Research
  - 3.3.1. Introduction
  - 3.3.2. Definition of Health and Disease
  - 3.3.3. Animal Welfare: Indicators and Determinants
    - 3.3.3.1. Stress
    - 3.3.3.2. Management
    - 3.3.3.3. Hygiene
    - 3.3.3.4. Transport
  - 3.3.4. Health
    - 3.3.4.1. Disease Transmission
    - 3.3.4.2. Registration and Controls
    - 3.3.4.3. Individual and Herd Clinical Assessment
    - 3.3.4.4. Complementary Tests
    - 3.3.4.5. Reporting and Monitoring
- 3.4. Diagnosis and Clinical Reasoning
  - 3.4.1. Introduction
  - 3.4.2. Diagnostic Process
    - 3.4.2.1. Clinical Examination
    - 3.4.2.2. Hypothetical-Deductive Reasoning
    - 3.4.2.3. Archive
  - 3.4.3. Reasoning Patterns
    - 3.4.3.1. Pattern Recognition Methods
    - 3.4.3.2. Probability
    - 3.4.3.3. Pathophysiological Reasoning
  - 3.4.4. Clinical Signs and Diagnostic Tests
    - 3.4.4.1. Logical Exclusion of Disease
    - 3.4.4.2. Inductive-Deductive Reasoning
  - 3.4.5. Errors
  - 3.4.6. Clinical Reasoning Exercise
    - 3.4.6.1. Clinical Scenarios
    - 3.4.6.2. Clinical Examination
    - 3.4.6.3. Clinical Reasoning
- 3.5. Special Diagnostic Procedures
  - 3.5.1. Introduction
  - 3.5.2. Skin
  - 3.5.3. Cardiovascular
    - 3.5.3.1. Percussion
    - 3.5.3.2. Electrocardiography
    - 3.5.3.3. Ultrasound
    - 3.5.3.4. Radiography
    - 3.5.3.5. Pericardiocentesis
    - 3.5.3.6. Blood Culture
  - 3.5.4. Respiratory System
    - 3.5.4.1. Bronchoalveolar Lavage
    - 3.5.4.2. Parasitological Tests
    - 3.5.4.3. Nasal Swabs
    - 3.5.4.4. Radiography
    - 3.5.4.5. Ultrasound
    - 3.5.4.6. Thoracentesis
    - 3.5.4.7. Biopsy
    - 3.5.4.8. Bio Markers



- 3.5.5. Abdomen
  - 3.5.5.1. Rectal Examination
  - 3.5.5.2. Rumen Fluid Analysis
  - 3.5.5.3. Abdominocentesis
  - 3.5.5.4. Radiography
  - 3.5.5.5. Hepatic Biopsy
  - 3.5.5.6. Liver Function Test
  - 3.5.5.7. Urinary
- 3.5.6. Mammary Glands
  - 3.5.6.1. California Mastitis Test
  - 3.5.6.2. Conductivity
  - 3.5.6.3. Collection for Microbiological Analysis
- 3.5.7. Musculoskeletal System
  - 3.5.7.1. Arthrocentesis
- 3.5.8. Cerebrospinal Fluid Analysis
- 3.6. Antimicrobial Therapy in Cattle
  - 3.6.1. Introduction
  - 3.6.2. Characteristics of the Different Groups of Antimicrobials
    - 3.6.2.1. Sulfonamides
    - 3.6.2.2. Penicillins
    - 3.6.2.3. Tetracyclines
    - 3.6.2.4. Macrolides
    - 3.6.2.5. Aminoglycosides
    - 3.6.2.6. Cephalosporins
    - 3.6.2.7. Lincosamides
  - 3.6.3. Categorization of Antibiotics According to the Risk of their Use
  - 3.6.4. Selection of an Antimicrobial According to the Process
  - 3.6.5. Bacterial Resistance to Antimicrobials
- 3.7. Fluid Therapy
  - 3.7.1. Introduction
  - 3.7.2. Fluid Therapy in Calves
    - 3.7.2.1. Lactic Acidosis in Calves
  - 3.7.3. Fluid Therapy in Adult Cattle
    - 3.7.3.1. Sodium Balance and Dysnatremias
    - 3.7.3.2. Hypokalemic Syndrome in Cattle
    - 3.7.3.3. Calcium and Magnesium Disorders
    - 3.7.3.4. Treatment of Phosphorus Balances
  - 3.7.4. Fluid Therapy in Small Ruminants
  - 3.7.5. Use of Blood and Blood Products in Ruminants
- 3.8. Analgesia
  - 3.8.1. Assessment of Pain in Cattle
  - 3.8.2. Negative Effects of Pain
    - 3.8.2.1. Chronic Pain
    - 3.8.2.2. Acute Pain
  - 3.8.3. Strategies for the Treatment of Pain
    - 3.8.3.1. Preventive Analgesia
    - 3.8.3.2. Multimodal or Balanced Analgesia. Analgesic Drugs
    - 3.8.3.3. Opioids
      - 3.8.3.3.1. Pure Agonists
      - 3.8.3.3.2. Partial Agonists
    - 3.8.3.4.  $\alpha$ 2-Agonists: Xylazine, Detomidine
    - 3.8.3.5. NSAIDs: Ketoprofen, Carprofen, Meloxicam
    - 3.8.3.6. Local Anesthetic. Lidocaine
    - 3.8.3.7. Dissociative Anesthetics. Ketamine
  - 3.8.4. Local Anesthetics
    - 3.8.4.1. Transduction
    - 3.8.4.2. Peripheral of Conduction Blockages
    - 3.8.4.3. Intravenous Regional Anesthesia

- 3.8.4.4. Nerve Blocks
- 3.8.4.5. Epidural Administration of Drugs
- 3.8.4.6.  $\alpha$ 2-Agonists:
  - 3.8.4.6.1.  $\alpha$ 2-Agonists Mechanism of Action, Adverse Effects, Antagonists
  - 3.8.4.6.2. Routes of Administration. Epidural, IV, IM, SC
- 3.8.5. Combination with Other Drugs: Local Anesthetics, Opiates, Ketamine
  - 3.8.5.1. NSAIDs
  - 3.8.5.2. Mechanism of Action
  - 3.8.5.3. Types of NSAIDs
  - 3.8.5.4. Central Modulatory Inhibitory Effect
  - 3.8.5.5. Preoperative and Postoperative Application
  - 3.8.5.6. Anesthetics
- 3.9. Sedation and Anesthesia Effect
  - 3.9.1. Introduction
  - 3.9.2. Pharmacological Immobilization
    - 3.9.2.1. Means of Teleapplication
      - 3.9.2.1.1. Directly in a Crate or Sleeve Handle
      - 3.9.2.1.2. By Syringe
      - 3.9.2.1.3. At a Distance, Applying Darts with the Drug
    - 3.9.2.2. Animal in Decubitus or Standing Animal
      - 3.9.2.2.1. Tranquilization Methods
      - 3.9.2.2.2. Animal Standing Combining Sedative and Local Anesthesia Techniques
  - 3.9.3. Pharmacological Immobilization plus Locoregional Anesthesia
    - 3.9.3.1. The  $\alpha$ 2-Receptor Agonist Tranquilizers: Xylazine, Detomidine, Romifidine, Medetomidine
    - 3.9.3.2. Advantages of  $\alpha$ 2-Receptor Agonists
      - 3.9.3.2.1. Volume
      - 3.9.3.2.2. Sedative Effect
      - 3.9.3.2.3. Analgesic
      - 3.9.3.2.4. Mixed
      - 3.9.3.2.5. Antagonizable
    - 3.9.3.3. Disadvantages of  $\alpha$ 2-Receptor Agonists
    - 3.9.3.4. Intraoperative and Postoperative Analgesia
      - 3.9.3.4.1.  $\alpha$ 2, Opiates, Ketamine and Tiletamine
      - 3.9.3.4.2. Local and Regional Anesthesia
      - 3.9.3.4.3. NSAIDs (Non-Steroidal Anti-Inflammatory Drugs)
- 3.10. Local and Regional Analgesia
  - 3.10.1. Incision Line Infiltration Blockage
  - 3.10.2. Inverted Block
    - 3.10.2.1. Inverted L-Block
    - 3.10.2.2. Paravertebral Block
      - 3.10.2.2.1. Proximal and Distal Paravertebral Anesthesia
      - 3.10.2.2.2. Dorsal and Ventral Branch Blockage
  - 3.10.3. Epidural Anesthesia
    - 3.10.3.1. Administration
    - 3.10.3.2. Localisation
    - 3.10.3.3. Indications
    - 3.10.3.4. The Doses
    - 3.10.3.5. Duration of Effect
    - 3.10.3.6. Applied Pharmacological Combinations
  - 3.10.4. Anesthetics
    - 3.10.4.1. Ketamine
    - 3.10.4.2. Tiletamine
    - 3.10.4.3. Etorphine. Prohibited its Use, Possession and Commercialization
      - 3.10.4.3.1. Withdrawn from the Market in 2005
  - 3.10.5. Update on Anesthesia in Cattle and Other Ruminants
    - 3.10.5.1. New Anesthetic Protocol
    - 3.10.5.2. Anesthetic Model
    - 3.10.5.3. Anesthetic Combination. Phencyclidines-Detomidine
      - 3.10.5.3.1. Zolazepam-Tiletamine
      - 3.10.5.3.2. Ketamine
      - 3.10.5.3.3. Detomidine



- 3.10.6. Maintaining the Anesthesia
  - 3.10.6.1. Dosage
  - 3.10.6.2. Antagonization
    - 3.10.6.2.1. Precautions
    - 3.10.6.2.2. Basic Anesthetic Monitoring
- 3.10.7. Anesthetic Depth
  - 3.10.7.1. Cardiovascular System
  - 3.10.7.2. Heart Rate
  - 3.10.7.3. Peripheral Pulse Palpation
  - 3.10.7.4. Capillary Refill Time
  - 3.10.7.5. Respiratory System
  - 3.10.7.6. Respiratory Rate and Pattern
  - 3.10.7.7. Mucosal Color
  - 3.10.7.8. Electronic Monitors: Portable Pulse Oximeter



*Achieve professional success with this high-level training provided by prestigious professionals with extensive experience in the sector"*

# 05 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 training, 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 re-learn). 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.



06

# Certificate

The Postgraduate Diploma in Cardiorespiratory, Oncological and Neurological Pathologies in Small Animals guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Global University.



“

*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"*

This program will allow you to obtain your **Postgraduate Diploma in Ruminant Cardiorespiratory, Gastrointestinal and Urinary Diseases** 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.

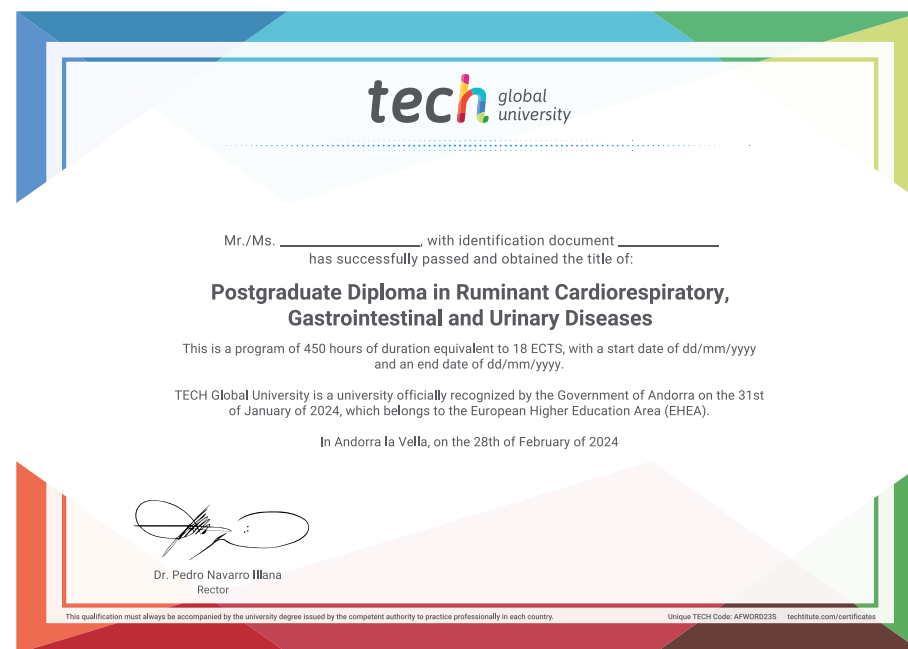
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Diploma in Ruminant Cardiorespiratory, Gastrointestinal and Urinary Diseases**

Modality: **online**

Duration: **6 months**

Accreditation: **18 ECTS**



\*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.

future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
development language  
virtual classroom



**Postgraduate Diploma**  
Ruminant Cardiorespiratory,  
Gastrointestinal and  
Urinary Diseases

- » Modality: **online**
- » Duration: **6 months**
- » Certificate: **TECH Global University**
- » Credits: **18 ECTS**
- » Schedule: **at your own pace**
- » Exams: **online**

# Postgraduate Diploma

## Ruminant Cardiorespiratory, Gastrointestinal and Urinary Diseases

