

# Hybrid Professional Master's Degree Veterinary Nutrition





## Hybrid Professional Master's Degree Veterinary Nutrition

Modality: Hybrid (Online + Clinical Internship)

Duration: 12 months

Certificate: TECH Technological University

Teaching Hours: 1,620 h.

Website: [www.techtute.com/us/veterinary-medicine/hybrid-professional-master-degree/hybrid-professional-master-degree-veterinary-nutrition](http://www.techtute.com/us/veterinary-medicine/hybrid-professional-master-degree/hybrid-professional-master-degree-veterinary-nutrition)

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# 01

# Introduction

The animal world faces new challenges every day related to digestive processes, food tolerances or problems with the metabolism of different species. Therefore, alongside industry experts TECH has designed this program focused on Veterinary Nutrition, to give a global and complete perspective of the nutrients needed by animals that veterinary professionals can update and improve their technical and practical knowledge within the sector of animals for protein production, monogastrics (poultry and pigs) and ruminants (cattle). The future graduate specializes in animal production systems by developing critical and reflective thinking. In just 12 months and under the guidance of the best experts in the Veterinary Nutrition sector, the professional will learn 100% online, all the innovations that will be applied in a prestigious center in an internship period for 3 weeks and therefore, live an enriching experience that will help set the appropriate professional background to the new challenges that are presented today.





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*Become a prestigious animal nutritionist with  
TECH's Hybrid Professional Master's Degree with  
a clinical practice in a renowned veterinary center"*

The Hybrid Professional Master's Degree in Veterinary Nutrition specializes professionals in one of the sectors of Animal Production with the most demand in labor and the need for specialization. It is a unique program given its level of specialization and the logical sequence of learning. This allows to organize the content developed by experts in the area, structured in 10 meticulously elaborated modules. Additionally, it combines the possibility of practical training to successfully complete the program.

The program establishes the fundamental principles of Veterinary Nutrition for a later approach to nutrition and feeding by species. In addition, it studies in depth the main raw materials used in the formulation of balanced feed, the characteristics, inclusion levels and quality parameters, since without quality in the basic components of the feed, there is no nutrition. On the other hand, it devotes part of its agenda to the additives used in the manufacture of rations, a segment that evolves year after year and within which important topics such as antibiotic-free production and the use of phytogenics, another highly topical issue, are developed.

The current world population, estimated at 7.9 billion, is expected to increase to 8.6 billion by 2030, and animal nutrition is one of the disciplines called upon to help solve the problem of producing sufficient and economical protein to feed this growing demand in an efficient and sustainable manner. Therefore, this program is essential for a sustainable development of animal production, also oriented to human consumption.

In summary, this Hybrid Professional Master's Degree is an ambitious, broad, structured and intertwined proposal, which covers from the fundamental and relevant principles of nutrition to the manufacture of feed. In addition, it specializes the student in the food manufacturing process with the latest innovations and the newest technology in the current market. Additionally, being hybrid learning, it has an internship in the best specialized center in the area of study, where students will acquire the skills they need from the hands of the best specialists on the national scene.

This **Hybrid Professional Master's Degree in Veterinary Nutrition** contains the most complete and updated scientific program on the market. Its most outstanding features are:

- ◆ Development of more than 100 scientific cases presented by veterinary professionals, experts in Veterinary Nutrition and university professors with extensive experience in the sector
- ◆ The graphic, schematic and eminently practical contents with which they are conceived, provide scientific and assistance information on those medical disciplines that are essential for professional practice
- ◆ Presentation of the most advanced and innovative methods of feed evaluation and processing to ensure effective veterinary nutrition
- ◆ Veterinary Research Practice Guidelines on Veterinary Nutrition and the different casuistry
- ◆ With a special emphasis on evidence-based veterinary medicine and the practical exercises needed to enhance the update
- ◆ All of this will be complemented by theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ◆ Content that is accessible from any fixed or portable device with an Internet connection
- ◆ Furthermore, you will be able to carry out a clinical internship in one of the best Veterinarian centers



*This program combines the possibility of practical training to successfully complete the program"*

“ *Improve your veterinary skills in a field with future projection: veterinary nutrition and do it with the best thanks to TECH”*

In this Master's proposal, of a professionalizing character and hybrid mode, the program is aimed at updating veterinary professionals who focus on Veterinary Nutrition and require a high level of qualification. The contents are based on the latest scientific evidence and oriented in a didactic way to integrate theoretical knowledge in veterinary practice, and the theoretical-practical elements will facilitate the updating of knowledge and will allow decision making in the management of each case presented.

Thanks to its multimedia content elaborated with the latest educational technology, they will allow the veterinary professional to obtain a situated and contextual learning, that is to say, a simulated environment that will provide an immersive learning programmed to train in real situations. This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise throughout the program. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.

*You can combine the study of this Professional Master's degree with your work and personal life, since its theoretical content is 100% online.*

*You will be able to successfully propose technical arguments to improve the quality of diets and, therefore, the productive response (meat or milk).*



# 02

## Why Study this Hybrid Professional Master's Degree?

This Hybrid Professional Master's Degree contains study material, developed with the latest educational technology, which will allow the professional a situated and contextual learning, i.e., a simulated environment that will provide the necessary knowledge to train in real situations. In its configuration, professionals in the field of Veterinary Nutrition have participated, sharing the experience of their work, as well as renowned specialists from reference societies who have composed exclusive content for this academic space. On the other hand, promoting a new teaching model, TECH has established agreements with veterinary centers in different parts of the world so that at the end of the 100% online theoretical part, the training is completed with a face-to-face internship with a multidisciplinary team and the guidance of a designated tutor. Therefore, the professional will be prepared to take on great challenges in their sector of specialization.



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*A unique program that will allow you to study the different methods of evaluating the chemical composition of feed and the quality of raw materials for ruminants and non-ruminants"*

### 1. Updating from the latest technology available

TECH presents a highly efficient study proposal for those who wish to update their participatory skills in the labor market. The field of Veterinary Nutrition does not escape from technological and scientific advances, so being up to date is essential for those who are dedicated to the sector. Because of this, this training places the student in front of all the innovations of the subject through the most complete content and the immersion in a specialized center.

### 2. Gaining In-Depth Knowledge from the Experience of Top Specialists

The student will obtain the best knowledge from professionals with decades of experience and with an active role in the working sector, which will allow them to broaden their vision in the most important areas of Veterinary Nutrition. Additionally, they will share a stay in a specialized center that will allow them to see the performance of the experts for 3 weeks, making the learning process more effective.

### 3. Entering First-Class Clinical Environments

In this program the student will improve their professional background, thanks to TECH's exclusive agreement with prestigious companies to learn by doing, in different parts of the world for 3 weeks. Selected according to a thorough study of the conditions and advantages that could offer for this training, which guarantees the quality that the student needs.





#### 4. Combining the Best Theory with State-of-the-Art Practice

The combination of effective teaching methods in an innovative educational model has allowed TECH to demonstrate in this program the possibility for the veterinary specialist to strengthen their knowledge in the field of veterinary nutrition. An exclusive and avant-garde academic space where you can learn alongside the most experienced professionals.

#### 5. Expanding the Boundaries of Knowledge

With TECH it is possible to access a new learning model, which involves practical activity to learn by doing and, in addition, with real experts. Therefore, these trainings can be carried out in different parts of the world according to the agreements established with companies in the sector. This is an opportunity that only this institution, aware of the need to create new spaces for professional training, can offer you.

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*You will have full practical immersion at the center of your choice”*

# 03 Objectives

The objectives of the Hybrid Professional Master's Degree in Veterinary Nutrition are to promote the student's professional career so that they can broaden their field of work and contribute to the nutritional study of the different species that come to veterinary clinics. In this way, they will learn to identify and classify which foods are essential for each case, will know how to create diets according to the symptoms and nutritional requirements of each case, as well as analyze the complete manufacturing process of nutrient-rich foods for the animal kingdom, its phases and processes to which they are subjected to ensure compliance with quality standards. Additionally, you will develop the skills acquired in a practical way in a veterinary center of reference, guided by the best experts.



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*Your goal is to position yourself successfully in the field of Veterinary Nutrition. Get it thanks to TECH”*



## General Objective

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- The general objective of the Hybrid Professional Master's Degree in Veterinary Nutrition is to achieve that the professional updates the technical and methodological procedures in their specialty in an exclusively practical way, through a face-to-face stay in a recognized veterinary center for 3 weeks to demonstrate the technological and scientific progress of the subject. In this program, the professional will approach the main interventions of the specialist, which will allow them to improve and increase their skills in terms of research and approach to Veterinary Nutrition in different cases



*You will be an expert in the use of enzymes in balanced feed, knowing how to correctly apply their benefits to the formulation of diets"*





## Specific Objectives

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### Module 1. Introduction to Nutrition and Animal Food

- ◆ Determine how digestive systems are formed and the differences between animal species (monogastrics and ruminants)
- ◆ Analyze the functionality, metabolism and differences between the digestive systems of different species
- ◆ Establish the different nutritional components of the raw materials used in food production and their function within Veterinary Nutrition
- ◆ Determine how the nutrients are used by different animal species
- ◆ Compare and contrast the digestive systems of the main species of zotechnical interest
- ◆ Identify the different nutritional components of the raw materials used in feed production and their function within Veterinary Nutrition
- ◆ Develop the variables and units used to estimate the nutritional intake and requirements
- ◆ Determine how to measure the energy content of foods and their expressions

## Module 2. Chemical Composition of Food and Quality of the Raw Materials for Ruminants and Non-Ruminants

- ♦ Develop the most important concepts of Veterinary Nutrition, taking into account the functions and effects of feed in the digestion process in large and small livestock
- ♦ Classify foods according to their origin and their nutritional characteristics
- ♦ Design a balanced diet considering the nutritional requirements of the species and categories
- ♦ Implement the procedures for manufacturing concentrates, guaranteeing the quality of the product to be used for feeding the different productive species
- ♦ Apply nutrition and feeding strategies for the different productive species according to an annual program based on the herd's requirements
- ♦ Evaluate the nutritional quality and impact on production systems (meat or milk) of different fresh, preserved and natural feed. These could be either in direct grazing or as forage reserves such as hay (rolls) or whole plant silage, with or without the additives (Nutriliq, Smartfeed, etc.), Multi-Nutritional Blocks (MNB), Rumen Activator Supplements (RAS) or energy or protein concentrates
- ♦ Develop the main chemical determinations that characterize feed (concentrates, fresh forages, preserved forages and additives)

## Module 3. Nutrients and Metabolism

- ♦ Develop the different nutrients contained in the raw materials used in Veterinary Nutrition
- ♦ Develop the different components of each one of the nutrient groups
- ♦ Determine the destinations or metabolic pathways of nutrients to be utilized by the animal
- ♦ Establish how animals obtain energy from different nutrients and what energy metabolism consists of
- ♦ Analyze the different assimilation processes of nutrients that different species of animals have and which are necessary for their well-being and production
- ♦ Evaluate the importance of water as a nutrient and the effect that it has on animals





#### **Module 4. Digestibility, Ideal Protein and Advances in Veterinary Nutrition**

- ◆ Develop the concepts of digestibility and how it is determined
- ◆ Analyze the advances in protein nutrition and the importance of synthetic amino acids in Veterinary Nutrition
- ◆ Identify the factors which are involved in the definition of the different nutrient levels
- ◆ Establish the critical points in the use of fats, their quality and effect on nutrition
- ◆ Develop the basic concepts of organic minerals and their importance
- ◆ Support the concept of intestinal integrity and how to enhance it in production
- ◆ Analyze patterns in the use of antibiotics in Veterinary Nutrition
- ◆ Define the patterns in precision nutrition and the most influential factors in its application

#### **Module 5. Nutrition and Food in Poultry**

- ◆ Establish the nutritional requirements and the feeding programs of broiler chickens
- ◆ Specify the nutritional requirements of laying hens (commercial eggs)
- ◆ Specify the nutritional requirements and feeding programs in confusion matrices
- ◆ Identify the critical phases of broilers and layers and the adjustments that can be implemented through the use of special diets
- ◆ Establish the different nutritional strategies used to manage challenges such as heat stress and shell quality
- ◆ Analyze the Nutritional Profiles and Strategies that allow higher yield of meat cuts and modification of egg size
- ◆ Determine the different production phases in commercial poultry farming by species
- ◆ Compile the different feeding programs in commercial poultry farming
- ◆ Apply different strategies in the application of feeding programs focused on guaranteeing zootechnical results

### **Module 6. Nutrition and Food in Pigs**

- ♦ Establish the nutritional requirements of fattening pigs
- ♦ Determine the nutritional requirements of breeding sows
- ♦ Identify the different stages of production in commercial swine farming
- ♦ Develop different feeding programs in commercial swine farming
- ♦ Analyze different strategies in the application of feeding programs focused on guaranteeing zootechnical results
- ♦ Understand the anatomical and physiological differences in the digestive system of swine which allows them to use alternative raw materials in their diet
- ♦ Establish the nutritional requirements of slaughter pigs according to their age, production stage and genetic line
- ♦ Establish the nutritional requirements of sows and breeding boars in each of their life stages and production phases
- ♦ Design nutritional and feeding programs for swine according to their specific requirements based on age and physiological state
- ♦ Develop different feeding programs in commercial swine farming
- ♦ Apply different strategies in the application of feeding programs focused on guaranteeing zootechnical results

### **Module 7. Nutrition and Food in Canines and Felines**

- ♦ Identify myths related to the diet of cats and dogs
- ♦ Establish nutritional requirements for cats and dogs
- ♦ Analyze the concept of a balanced diet focusing on the factors that influence their ingestion
- ♦ Analyze the dietary treatments in certain pathologies whose use is aimed at reducing symptoms and improving the animal's condition
- ♦ Guarantee an appropriate diet according to the stage of development
- ♦ Evaluate the types of food available on the pet food market
- ♦ Establish an appropriate diet based on physiological state and the development of the species in question

### **Module 8. Nutrition and Food in Ruminants**

- ♦ Analyze the digestive system of ruminants and their particular way of assimilating nutrients from fiber-rich foods
- ♦ Analyze the nutritional metabolism of ruminants, recognising their potential and their limitations
- ♦ Determine the nutritional requirements for the maintenance and production of the main ruminants of zootechnical interest
- ♦ Examine the main food resources for ruminants' nutrition, their main characteristics, their advantages and limitations
- ♦ Evaluate the main feeding strategies for ruminants according to the production context



### Module 9. Additives in Animal Food

- ◆ Analyze the different types of additives which exist in the animal feed and nutrition market
- ◆ Define the recommendations for the use and functionality of the different additive groups
- ◆ Gain up-to-date knowledge of the new technology focused on improving the quality and efficiency of animal feed
- ◆ Identify mycotoxins as the hidden enemy in diet quality, animal health and productivity; what are the strategies for their control, the different types and use of mycotoxin binders
- ◆ Specialize in the use of enzymes in balanced feed, what are the differences between enzymes of the same category, what they are used for and the benefits of their incorporation in the diet
- ◆ Analyze phytochemicals as a category that goes beyond essential oils; what they are, types of phytochemical substances, modes of use and benefits

### Module 10. Manufacturing of Balanced Foods: Processes, Quality Control and Critical Points

- ◆ Determine the processes involved in the creation of feed for animals
- ◆ Establish an appropriate way to manage raw materials
- ◆ Analyze the different feed presentations and the feed manufacturing processes themselves
- ◆ Identify the different equipment used in the manufacturing of food
- ◆ Implement monitoring and control programs at critical points in the food manufacturing process
- ◆ Implement sampling and establish its importance in the quality control process

# 04 Skills

After completing this Hybrid Professional Master's Degree the veterinary professional will achieve heightened skills in the sector, which will boost their in the labor market. The intensive program proposed will enable them to develop in all areas related to the feeding of production animals, with the assurance of becoming an expert in the field and the guarantee of TECH. Therefore, through this curriculum and practical training, the student specializes and updates in the most advanced technical and scientific aspects of veterinary nutrition.





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*You will be able to propose a suitable diet for each species, as this program shows you the parameters to be taken into account for it to be successful"*



## General Skills

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- ♦ Gain the specific understanding of Veterinary Nutrition in the field of veterinary science
- ♦ Describe the nutritional needs of animals by determining the metabolic aspects of each different species
- ♦ Recognize the other functions of nutrients in the context of animal production and health
- ♦ Know how to plan an appropriate diet for each species, taking into account availability and opportunity according to the geographical location where it is found
- ♦ Know the nutritional requirements for poultry for human consumption
- ♦ Implement appropriate nutritional programs for the swine species, according to the required welfare and production criteria
- ♦ Recognise the requirements for canine and feline diets and create appropriate nutritional plans
- ♦ Know the nutritional requirements of ruminants
- ♦ Know how the animal feed manufacturing process is carried out and which additives are included in it, as well as its suitability





## Specific Skills

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- ♦ Describe the digestive systems of the different animal species, recognising the differences in metabolism
- ♦ Recognize the nutritive components in raw materials and be able to conduct an analysis of them
- ♦ Create a nutritional classification of feeds according to their nutritional characteristics in order to propose appropriate diets for different species and situations
- ♦ Determine how different nutritional approaches affect different animal production species
- ♦ Utilize extensive knowledge of all aspects of nutrients to understand the processes of energy and animal protein production
- ♦ Recognise the importance of water as a nutrient
- ♦ Understand the importance of the concept of digestibility and intestinal integrity and to know which are the factors that most influence them
- ♦ Define the use and characteristics of fats in Veterinary Nutrition
- ♦ Define the use of antibiotics in Veterinary Nutrition
- ♦ Perform a complete analysis and an appropriate intervention in all aspects of the raising of broiler chickens and laying hens
- ♦ Carry out nutritional strategies aimed at achieving zootechnical objectives
- ♦ Perform a complete analysis and appropriate intervention in all aspects of the raising of breeding and fattening pigs
- ♦ Know which are the alternative swine feeding strategies
- ♦ Recognize all nutritional aspects of cats and dogs and identify the myths surrounding them
- ♦ Know how to establish appropriate dietary treatments for every circumstance or pathology
- ♦ Determine what foods are available in the market and their suitability
- ♦ Perform a complete analysis and appropriate intervention in all nutritional aspects of ruminants
- ♦ Know which are the most appropriate strategies for feeding ruminants according to the geographical context
- ♦ Know the nutritional additives in animal feed and be aware of the up-to-date information surrounding this area
- ♦ Understand food production processes, as well as the proper handling of raw materials by understanding the processes and machinery involved
- ♦ Know how to perform quality control and, as part of the process, sampling at critical control points of animal feed

05

# Course Management

The teaching staff of this Hybrid Professional Master's Degree program has an excellent and extensive academic and professional background, synonymous with TECH's quality. Each one of them is an expert in the different subjects covered by the program, giving a complete and global vision of everything that covers the field of Veterinary Nutrition. Therefore, this team is made up of a multidisciplinary and transversal cast that has poured all their knowledge and experience into the design of an exceptional program, which also includes an internship in an exclusive veterinary center, which will enable students to achieve their academic goals.



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*A team of professionals in veterinary nutrition guarantee the quality of this Hybrid Professional Master's Degree, both in theoretical content and practical training"*

## Management



### Dr. Cuello Ocampo, Carlos Julio

- ♦ Technical Director at Huvepharma in Latin America
- ♦ Manager of the Veterinary Department of Química Suiza Industrial Guayaquil, Ecuador
- ♦ Key Account Manager (KAM) at Premex SA. Guayaquil, Ecuador
- ♦ Nutritional Advisor at Agricultural Alternatives SAS. Bogotá, Colombia
- ♦ Degree in Veterinary and Zootechnics from the National University. Colombia
- ♦ Professional Master's Degree in Animal Production with emphasis on Monogastric Nutrition
- ♦ Postgraduate Certificate in Ration Formulation for Productive Species Medicine by the UDCA

## Professors

### Dr. Portillo Hoyos, Diana Paola

- ♦ Animal technician
- ♦ Zootechnician at Dog Home Veterinary Clinic
- ♦ Zootechnician at Productos Lácteos San Andrés
- ♦ Expert researcher in Animal Production
- ♦ Co-author of several books on veterinary medicine
- ♦ Zootechnician at the National University of Colombia

### Dr. Fernández Mayer, Aníbal Enrique

- ♦ Academic researcher at the Institute of Animal Science of the University of Havana (INTA)
- ♦ Specialist and Private Advisor in Milk Production
- ♦ Technician Specialized in Animal Production at the Bordenave Agricultural Experimental Station
- ♦ Agricultural Engineer from the University of Nacional de la Plata
- ♦ Veterinary Doctor from the La Habana Agricultural University



**Mr. Fernández de Juan, Álvaro**

- ◆ Monogastric nutrition technician at Nugest
- ◆ Support Researcher at the Polytechnic University of Madrid
- ◆ Master's Degree in Animal Production and Health from the Polytechnic University of Madrid
- ◆ Degree in Agricultural Engineering , specialized from the Polytechnic University of Madrid

**Dr. Rodríguez Patiño, Leonardo**

- ◆ Technical Manager at Avícola Fernandez (poultry company)
- ◆ Nutritionist at Grupo Casa Grande
- ◆ Nutritionist at Unicol
- ◆ Technical-Commercial Consultant at PREMEX
- ◆ Nutritionist at Corporación Fernandez SA
- ◆ Master's Degree in Animal Nutrition
- ◆ Zootechician at the National University of Colombia.

**Dr. Scappaticcio, Rocco**

- ◆ Nutritionist Technician and head of R+D+i at Camar Agroalimentaria. SL
- ◆ Industrial Technical Engineer at the Industrial Technical Institute E. Majorana Cassino
- ◆ PhD in Animal Nutrition from the Polytechnic University of Madrid
- ◆ Master's Degree in Animal Production Science and Technology from the University of Perugia
- ◆ Master's Degree in Animal Production and Health at Polytechnic University of Madrid

**Dr. Sarmiento García, Ainhoa**

- ◆ Collaborative researcher at the Faculty of Agricultural and Environmental Sciences and the Polytechnic School of Zamora at the University of Salamanca
- ◆ Research Director at Entogreen
- ◆ Reviewer of scientific articles in Iranian Journal of Applied Science
- ◆ Veterinarian in charge of the nutrition department at Casaseca Livestock
- ◆ Veterinary Clinic El Parque in Zamora
- ◆ Associate Professor at the Faculty of Agricultural Sciences of the University of Salamanca
- ◆ Degree in Veterinary Medicine from the University of León
- ◆ PhD. in Chemical Science and Technology from the University of Salamanca
- ◆ Master's Degree in Innovation in Biomedical and Health Sciences by the University of León

**Mr. Ordoñez Gómez, Ciro Alberto**

- ◆ Researcher specialized in animal nutrition
- ◆ *Author of the book Glycerin and biodiesel by-products: alternative energy for poultry and swine feed*
- ◆ Teacher in the area of animal nutrition and feeding at the Francisco de Paula Santander University
- ◆ Master's Degree in animal production at the Francisco de Paula Santander University
- ◆ Degree in Animal Husbandry from Francisco de Paula Santander University





#### **Dr. Crespo Sancho, Rubén**

- ◆ Technical Director in Biochem Zusatzstoffe Handels- und Produktionsgesellschaft mbH
- ◆ Technical Director in Central Europe and Latin America in Biochem Zusatzstoffe Handels- und Produktionsgesellschaft mbH
- ◆ Commercial Director of Agrimprove Iberia in Agrifirm
- ◆ Degree in Technical Agricultural Engineering from the Polytechnic University of Madrid
- ◆ PhD in Agro-environmental Technology for Sustainable Agriculture from the Polytechnic University of Madrid
- ◆ International Master's Degree in Animal Nutrition from the University of Zaragoza
- ◆ Postgraduate Certificate in Agricultural Engineering, specializing in Agricultural Operations, Polytechnic University of Madrid

#### **Mr. González Aliseda, Bernardo**

- ◆ Engineer at Nutrave S.A
- ◆ Route inspector at Queserías Entrepinares
- ◆ Technical assistant at Cascos Santaolalia
- ◆ Degree in Agricultural Engineering from the Polytechnic University of Madrid



*You will develop the most advanced skills that will allow you to evolve in your career, from expert veterinary professionals with an active work profile"*

# 06

## Educational Plan

The contents of this program have been developed by the different experts on this Hybrid course, with a clear purpose: to ensure that our students acquire each and every one of the necessary skills to become true experts in Veterinary Nutrition. The structure of the curriculum and the internships make this program the most complete on the market today, as it covers all the relevant knowledge for the specialist to develop successfully in the field of nutrition. Throughout 10 modules, students can combine their studies with the exercise of their job functions. It includes a syllabus that introduces the basic aspects of animal nutrition and feeding, the chemical composition of food and its application by species up to the development of new nutrients.





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*You will learn the measures of the nutritional value of food and their methods of evaluation in different animals"*

## Module 1. Introduction to Animal Nutrition and Feeding

- 1.1. Nutrition and Animal Food. Concepts
  - 1.1.1. Introduction to the Concepts of Nutrition and Food
  - 1.1.2. Nutrients: Definition and Characteristics
  - 1.1.3. Importance of Animal Nutrition
- 1.2. Digestive Systems and Food Adaptation
  - 1.2.1. Digestive System and the Digestion Process in Birds
  - 1.2.2. Digestive System and the Digestion Process in Pigs
  - 1.2.3. Digestive System and the Digestion Process in Ruminants
  - 1.2.4. Digestive System and the Digestion Process in Fish (aquatic poikilotherms)
  - 1.2.5. Gastrointestinal Functionality in Animal Nutrition and Health
- 1.3. Digestive System in Ruminants
  - 1.3.1. The Rumen as a Source of Nutrients
  - 1.3.2. Ruminal Physiology
  - 1.3.3. The Digestion Process in Ruminants
  - 1.3.4. Volatile Fatty Acids
  - 1.3.5. Protein of Bacterial Origin
- 1.4. Measurements of Nutritional Value of Foods and Evaluation Methods
  - 1.4.1. Characterization of Context
  - 1.4.2. Physical and Chemical Characterization
  - 1.4.3. Obtaining Information on the Composition of Nutrients
  - 1.4.4. Weende Proximate Analysis
  - 1.4.5. Van Soest Analysis
    - 1.4.5.1. Analysis using Specialized Analytical Methods
    - 1.4.5.2. Heat Meter Pump
    - 1.4.5.3. Amino Acid Analysis
    - 1.4.5.4. Atomic Absorption Spectrophotometry
    - 1.4.5.5. Automized Analysis Equipment
    - 1.4.5.6. Biological and Nutritional Characterization
- 1.5. Forms of Food Energy
  - 1.5.1. Forms of Energy Expression
  - 1.5.2. Gross Energy
  - 1.5.3. Digestive Energy
    - 1.5.4. Metabolizable Energy
    - 1.5.5. Net Energy
    - 1.5.6. Calculation of Values (EB-ED-EM-EN) according to the NRC and ARC systems
- 1.6. Energy Content of Food Ingredients
  - 1.6.1. Energy sources
  - 1.6.2. Energy and Consumption
  - 1.6.3. Energy Balance
  - 1.6.4. Energetic Density
- 1.7. Protein and Amino Acid Content of Food Ingredients
  - 1.7.1. Animal Protein Functions
  - 1.7.2. Protein Food Resources
    - 1.7.2.1. Plant Sources - Oilseeds
    - 1.7.2.2. Plant Sources - Legumes
    - 1.7.2.3. Animal Sources
- 1.8. Protein Quality and Digestibility
  - 1.8.1. Protein Quality
    - 1.8.1.1. Amino Acid Profile
  - 1.8.2 Digestibility
    - 1.8.2.1. Apparent Digestibility
    - 1.8.2.2. Real Digestibility
    - 1.8.2.3. Nitrogen Balance
    - 1.8.2.4. Biological Value
    - 1.8.2.5. Net Usage of Protein
    - 1.8.2.6. Protein Efficiency Ratio or Rate
    - 1.8.2.7. Chemical Score
    - 1.8.2.8. Protein Digestion
- 1.9. Other Important Nutrients in Veterinary Nutrition
  - 1.9.1. Minerals and Microminerals
    - 1.9.1.1. Classification, Functions, General Requirements
    - 1.9.1.2. Principal minerals: Calcium, Phosphorous, Magnesium, Sodium
    - 1.9.1.3. Microminerals: Cobalt, Iodine
  - 1.9.2. Vitamins
  - 1.9.3. Fibre
  - 1.9.4. Water:

- 1.10. Nomenclature and Classification of Foods (NRC)
  - 1.10.1. Forage or Dry Roughage
  - 1.10.2. Forage or Fresh Coarse Feed
  - 1.10.3. Silage
  - 1.10.4. Concentrated Energy
  - 1.10.5. Protein Energy
  - 1.10.6. Mineral Supplement
  - 1.10.7. Vitamin Supplement
  - 1.10.8. Non-nutritious Additives

## Module 2. Chemical Composition of Food and Quality of the Raw Materials for Ruminants and Non-Ruminants

- 2.1. Key Concepts of Raw Materials Used in Feeding Ruminants and Non-Ruminants
  - 2.1.1. Introduction
  - 2.1.2. Chemical Composition of Food
    - 2.1.2.1. Water and Dry Matter
    - 2.1.2.2. Organic Material and Minerals
    - 2.1.2.3. Protein Rich Foods
    - 2.1.2.4. Energy Rich Foods
    - 2.1.2.5. Vitamins
  - 2.1.3. Fresh Forage (greens)
    - 2.1.3.1. Winter Grains, Summer Grains and Pastures (Grasslands)
  - 2.1.4. Conserved Forages:
    - 2.1.4.1. Silage, Hay and Other Types of Preserved Fodder (Haylage, Silage)
      - 2.1.4.1.1. Silages
      - 2.1.4.1.2. Hay and Haylage
  - 2.1.5. Energy and Protein Concentrates
    - 2.1.5.1. Energy Compounds
    - 2.1.5.2. Protein Powders

- 2.2. Plant-Based By-products used in Feeding Ruminants and Non-Ruminants
  - 2.2.1. Cereal Grains
    - 2.2.1.1. Corn
      - 2.2.1.1.1. Fine-Ground Bran, Bran or Corn Bran
      - 2.2.1.1.2. *Corn Gluten Feed* and *Corn Gluten Meal*
        - 2.2.1.1.2.1. *Corn Gluten Feed*
        - 2.2.1.1.2.2. *Corn Gluten Meal*
  - 2.2.2. Sorghum Grain
  - 2.2.3. Oats, Barley and Wheat Grain
    - 2.2.3.1. Oat Grain
    - 2.2.3.2. Barley Grain
    - 2.2.3.3. Wheat Grain
      - 2.2.3.3.1. Fine-ground Bran, Bran or Wheat Bran
  - 2.2.4. Rice By-products
    - 2.2.4.1. Fine-ground Bran or Rice Bran
  - 2.2.5. Oilseed Byproducts
    - 2.2.5.1. Cotton
      - 2.2.5.1.1. Cotton Seed
      - 2.2.5.1.2. Cotton Flour
    - 2.2.5.2. Soya
      - 2.2.5.2.1. Soybeans
      - 2.2.5.2.2. Soybean Shell
      - 2.2.5.2.3. Soya Flour
    - 2.2.5.3. Sunflower
      - 2.2.5.3.1. Sunflower Shell
      - 2.2.5.3.2. Sunflower Flour
  - 2.2.6. Horticultural By-products
    - 2.2.6.1. Salad Cucumber Crop Residue
    - 2.2.6.2. Melon Crop Residue
    - 2.2.6.3. Tomato Crop Residue

- 2.3. Animal-Based By-products used in Feeding Ruminants and Non-Ruminants
  - 2.3.1. Dairy Industry
    - 2.3.1.1. Serum Permeate
    - 2.3.1.2. Cheese Whey and Butter
  - 2.3.2. Fishing Industry
    - 2.3.2.1. Fish Flour
  - 2.3.3. Meat Industry
    - 2.3.3.1. Recycled Animal Fat
  - 2.3.4. Poultry Production
    - 2.3.4.1. Feather Flour
      - 2.3.4.1.1. Processes to Improve Digestibility
      - 2.3.4.1.2. Supply Methods
  - 2.3.5. Chicken/ Hen Litter (Chicken Manure)
- 2.4. Fats and Oils used in Feeding Ruminants and Non-Ruminants
  - 2.4.1. Nutritional Values of Fats in the Feeding of Ruminants and Non-Ruminants
    - 2.4.1.1. Sources and Types of Fat
      - 2.4.1.1.1. Yellow Fat
      - 2.4.1.1.2. Tallow
      - 2.4.1.1.3. Mixed Fats
      - 2.4.1.1.4. Soap Extract and Other Sources of Fat
  - 2.4.2. Factors Which Indicate the Digestibility in Ruminants and Non-Ruminants
    - 2.4.2.1. Free Fatty Acids
    - 2.4.2.2. Proportion of Saturated and Unsaturated Fatty Acids
      - 2.4.2.2.1. Addition Method and Level of Inclusion
      - 2.4.2.2.2. Protected Fats
        - 2.4.2.2.2.1. Calcium Salts of Fatty Acids or Protected Soaps
        - 2.4.2.2.2.2. Saturated Fats with Variable Degrees of Hydrogenation
  - 2.4.3. Oils used in Feeding Ruminants and Non-Ruminants
    - 2.4.3.1. African Palm Oil
    - 2.4.3.2. Other Vegetable Oils
- 2.5. Probiotics, Prebiotics, Enzymes and Organic Acids in Feeding Ruminants and Non-Ruminants
  - 2.5.1. Characterization and Classification of Probiotics and Prebiotics
    - 2.5.1.1. Prebiotic
      - 2.5.1.1.1. Basifying Agents or Ruminant Buffers
      - 2.5.1.1.2. Organic Acids: Malic and Fumaric Acid
      - 2.5.1.1.3. Plant Extracts: Essential Oils
      - 2.5.1.1.4. Enzymes
    - 2.5.1.2. Probiotic
    - 2.5.1.3. Symbiotics
  - 2.5.2. Mechanisms of Action and Productive Response
    - 2.5.2.1. Effects on Young Animals
    - 2.5.2.2. Effects on Adult Animals
  - 2.5.3. Brewer's Yeast
    - 2.5.3.1. Reduction of Unpleasant Odors and Firm Stools
    - 2.5.3.2. Effects on Growing and Finishing Animals
    - 2.5.3.3. Effects on Lactating Cows
    - 2.5.3.4. Effects on Lactating Sheep
    - 2.5.3.5. Effects on Lactating Goats
- 2.6. Liquid Additives, Multinutritional Blocks and Rumen Activator Supplement for Ruminants
  - 2.6.1. Characteristics of Liquid Energy, Protein and Mineral Additives
  - 2.6.2. Multinutritional Blocks (MNB) and Rumen Activator Supplement (RAS)
    - 2.6.2.1. Procedure to Create MNB and RAS
      - 2.6.2.1.1. Proportions of Ingredients and Chemical Composition of MNB and RAS
        - 2.6.2.1.1.1. Composition of "MNB" or "RAS" with "Smartfeed"
        - 2.6.2.1.1.2. Composition of "MNB" or "RAS" with "Nutriliq 2050" (including Urea)
        - 2.6.2.1.1.3. Composition of "MNB" or "RAS" with Glucose or Molasses
        - 2.6.2.1.1.4. Composition of the Salty Minerals of the MNB and RAS
      - 2.6.2.2. Purpose of Each Ingredient
      - 2.6.2.3. Differences Between the MNB and RAS
      - 2.6.2.4. Forms of Supply and Consumption of BMN or SAR
      - 2.6.2.5. Experimental Work

- 2.7. Glycerol and Corn and Sorghum Starch for Ruminant and Non-Ruminant Feeds
  - 2.7.1. Glycerol
    - 2.7.1.1. Principal Characteristics of Glycerol
    - 2.7.1.2. Chemical Composition of Glycerol for Animal Consumption
    - 2.7.1.3. Productive Response
    - 2.7.1.4. Recommendations
  - 2.7.2. Corn and Sorghum Starch
    - 2.7.2.1. Chemical Composition
    - 2.7.2.2. Dry or Wet Starch
    - 2.7.2.3. Recommendations
- 2.8. Tannins, Saponins and Essential Oils in Ruminants
  - 2.8.1. Effect on Ruminal Bacteria
  - 2.8.2. Effects on Protozoa
  - 2.8.3. Effects on Rumen Fungi
  - 2.8.4. Effects on Methanogenic Bacteria
  - 2.8.5. Effect Secondary Metabolites of Plants
    - 2.8.5.1. Effects on the Digestibility
    - 2.8.5.2. Effects on the Parameters of Ruminal Fermentation
      - 2.8.5.2.1. Volatile Fatty Acids(AGV)
      - 2.8.5.2.2. Concentration of Ammonia
      - 2.8.5.2.3. Production of Gas
      - 2.8.5.2.4. Impacts on Rumen Degeneration and the Digestibility of DM and Cell Wall
      - 2.8.5.2.5. Impacts on Rumen Degeneration and the Digestibility of Protein
      - 2.8.5.2.6. Impacts on Digesta Transit Kinetics
    - 2.8.5.3. Effects on Methanogenesis
  - 2.8.6. Adaptations to Tannin Consumption
  - 2.8.7. Positive Effects of Tannins on the Non-Animal Metabolism and Some of the Productive Results
- 2.9. Mycotoxins and Contaminants in Concentrates and Forage Concentrates in both Ruminants and Non-Ruminants
  - 2.9.1. Characteristics of Mycotoxins, Typology of Fungi and Favorable Conditions
  - 2.9.2. Clinical Diagnosis of Mycotoxins, Symptomatology and Associated Diseases Affecting Ruminants and Non-Ruminants
    - 2.9.2.1. Ruminants
      - 2.9.2.1.1. Sensitivity
      - 2.9.2.1.2. Some Symptomatology
      - 2.9.2.1.3. Symptomatology Associated with Illnesses
      - 2.9.2.1.4. Mycotoxins and Mycotoxicosis in Poultry and Swine. Symptomatology and Associated Illnesses
        - 2.9.2.1.4.1. Aflatoxins
        - 2.9.2.1.4.2. Ochratoxins
        - 2.9.2.1.4.3. T-2 and DAS
        - 2.9.2.1.4.4. Fumonisin
        - 2.9.2.1.4.5. DON (vomitoxina)
    - 2.9.2.2. Non-Ruminants
      - 2.9.2.2.1. Mycotoxins and Mycotoxicosis in Poultry and Swine. Symptomatology and Associated Illnesses
        - 2.9.2.2.1.1. Aflatoxins
        - 2.9.2.2.1.2. Ochratoxins
        - 2.9.2.2.1.3. Trichothecenes
        - 2.9.2.2.1.4. Zearalenone
        - 2.9.2.2.1.5. Fumonisin
      - 2.9.2.2.2. Use of Mycotoxin-Absorbing Substances in Ruminant and Non-Ruminant Feeds
  - 2.9.3. Factors for the Development of Fungi and their Mycotoxins
    - 2.9.3.1. In the Countryside
    - 2.9.3.2. During Storage of the Concentrates

2.10. Analysis and Quality Control of the Ingredients used in Ruminants and Non- Ruminants

- 2.10.1. Chemical Determinations
  - 2.10.1.1. Dry Matter (DM)
  - 2.10.1.2. Organic Material (OM) and Minerals
  - 2.10.1.3. Digestibility of Dry Matter
    - 2.10.1.3.1. Direct Methods
    - 2.10.1.3.2. "In Vivo" Methods
  - 2.10.1.4. Indirect Methods
    - 2.10.1.4.1. "Different" Method
    - 2.10.1.4.2. Internal Markers
    - 2.10.1.4.3. Lignin
    - 2.10.1.4.4. Silica
    - 2.10.1.4.5. Acid Insoluble Ash
  - 2.10.1.5. External Markers
    - 2.10.1.5.1. Dyed Food
    - 2.10.1.5.2. Chromic Oxide
    - 2.10.1.5.3. Rare Earth Elements
    - 2.10.1.5.4. Mordant Chrome-Treated Fiber
    - 2.10.1.5.5. Hydrosoluble Markers
    - 2.10.1.5.6. Alkanes
  - 2.10.1.6. "In Vitro" Methods
    - 2.10.1.6.1. "In Vitro" Digestibility of Dry Matter (DM)
    - 2.10.1.6.2. Neutral Detergent Fiber (NDF)
    - 2.10.1.6.3. "In Vitro" Digestibility " of Neutral Detergent Fiber (NDF)
    - 2.10.1.6.4. Acidic Detergent Fiber (ADF)
  - 2.10.1.7. Protein
    - 2.10.1.7.1. Crude Protein (Total Nitrogen, CP)
    - 2.10.1.7.2. Soluble Crude Protein (SCP)
    - 2.10.1.7.3. Neutral Detergent Fiber-Bound Nitrogen (ADIN)
  - 2.10.1.8. Ethereal Extract (EE)
  - 2.10.1.9. Water Soluble Carbohydrates (WSC)
  - 2.10.1.10. Lignin, cellulose, hemicellulose and silica (LIG, CEL, HEM, SIL)
  - 2.10.1.11. Tannin
  - 2.10.1.12. PH in Silage Samples
  - 2.10.1.13. Particle Sizes

2.10.2. Summary of Some Laboratory Techniques

- 2.10.2.1. Total Nitrogen (semi-micro kjeldahl)
- 2.10.2.2. "In Vitro" Digestibility (Tilley Terry . Edited. Direct Acidification Method)
- 2.10.2.3. Neutral Detergent Fiber (NDF) (with ANKOM equipment)
- 2.10.2.4. Acidic Detergent Fiber (ADF) (with ANKOM equipment)
- 2.10.2.5. Soluble Non-Structural Carbohydrates (NSC) Antrona Method, Developed by A.J. Silva (Viscosa-Brasil)
- 2.10.2.6. Total Starch (Megazyme enzyme kit - AA/AMG) (AACC Method 76-12)

**Module 3. Nutrients and Metabolism**

3.1. Carbohydrates

- 3.1.1. Carbohydrates in Animal Food
- 3.1.2. Classification of Carbohydrates
- 3.1.3. Digestion Process
- 3.1.4. Fiber and Digestion of Fiber
- 3.1.5. Factors which Affect the Utilistion of Fiber
- 3.1.6. Physical Function of Fibre

3.2. Metabolism of Carbohydrates

- 3.2.1. Metabolic Fate of Carbohydrates
- 3.2.2. Glycolysis, Glycogenolysis, Glycogenesis and Gluconeogenesis
- 3.2.3. Pentose Phosphate Cycle
- 3.2.4. Krebs Cycle

3.3. Lipids

- 3.3.1. Classification of Lipids
- 3.3.2. Functions of Lipids
- 3.3.3. Fatty Acids
- 3.3.4. Digestion and Absorption of Fats
- 3.3.5. Factors which Affect Lipid Digestion



- 3.4. Lipid Metabolism
  - 3.4.1. Metabolic Fate of Lipids
  - 3.4.2. Fat Metabolism Energy
  - 3.4.3. Oxidative Rancidity
  - 3.4.4. Essential Fatty Acids
  - 3.4.5. Lipid Metabolism Problems
- 3.5. Energetic Metabolism
  - 3.5.1. Measurement of Heat Reaction
  - 3.5.2. Biological Partitioning of Energy
  - 3.5.3. Nutrient Caloric Increase
  - 3.5.4. Energy Balance
  - 3.5.5. Environmental Factors that Influence Energy Requirements
  - 3.5.6. Characteristics of Energy Deficiencies and Excesses
- 3.6. Proteins
  - 3.6.1. Protein Classification
  - 3.6.2. Functions of the Different Proteins
  - 3.6.3. Digestion and Absorption of Proteins
  - 3.6.4. Factors which Affect Protein Digestion
  - 3.6.5. Nutritional Classification of Amino Acids for Poultry and Swine
- 3.7. Protein Metabolism in Poultry and Swine
  - 3.7.1. Metabolic Fate of Proteins
  - 3.7.2. Gluconeogenesis and Degradation of Amino Acids
  - 3.7.3. Excretion of Nitrogen and Synthesis of Uric Acid
  - 3.7.4. Imbalance of Amino Acids and Energetic Cost of Protein Metabolism
  - 3.7.5. Interaction Between Amino Acids
- 3.8. Vitamins and Minerals
  - 3.8.1. Vitamin Classification
  - 3.8.2. Vitamin Requirements for Poultry and Swine
  - 3.8.3. Vitamin Deficiencies
  - 3.8.4. Macro and Micro minerals
  - 3.8.5. Interaction Between Minerals
  - 3.8.6. Organic Chelates

- 3.9. Mineral and Vitamin Metabolism
  - 3.9.1. Vitamin Interdependence
  - 3.9.2. Deficiencies and Toxicity of Vitamins
  - 3.9.3. Choline
  - 3.9.4. Metabolism of Calcium and Phosphorus
  - 3.9.5. Electrolyte Balance
- 3.10. Water. The Forgotten Nutrient
  - 3.10.1. Principal Functions of Water
  - 3.10.2. Distribution of Water in an Organism
  - 3.10.3. Sources of Water
  - 3.10.4. Factors Affecting Water Requirements
  - 3.10.5. Water Requirements
  - 3.10.6. Requirements for the Quality of Drinking Water

#### Module 4. Digestibility, Ideal Protein and Advances in Animal Nutrition

- 4.1. Apparent Digestibility Coefficients
  - 4.1.1. Techniques to Obtain the Ideal Digesta
    - 4.1.1.1. Methodology to Calculate Digestibility
  - 4.1.2. Endogenous Losses
    - 4.1.2.1. Origin and Composition of Endogenous Amino Acids
    - 4.1.2.2. Techniques to Measure Endogenous Losses
  - 4.1.3. Standardized Coefficients and True Digestibility
  - 4.1.4. Factors Affecting Digestibility Coefficients
    - 4.1.4.1. Age and Physical State
    - 4.1.4.2. Food Consumption and Composition
- 4.2. Synthetic Amino Acids in Animal Nutrition
  - 4.2.1. Synthesis of Synthetic Amino Acids
  - 4.2.2. Use of Synthetic Amino Acids in Diets
- 4.3. Ideal Protein and Advances in Protein Nutrition
  - 4.3.1. Concept of Ideal Protein
  - 4.3.2. Profiles of Ideal Protein
  - 4.3.3. Use of Practical Applications

- 4.4. Estimation of Nutritional Requirements Through Performance Experiments
  - 4.4.1. Evaluation Methods for Nutritional Requirements
  - 4.4.2. Requirements Determination
- 4.5. Factors Affecting Nutrient Utilization
  - 4.5.1. Age
  - 4.5.2. Physiological Condition
  - 4.5.3. Level of Consumption
  - 4.5.4. Environmental Conditions
  - 4.5.5. Diet
- 4.6. Importance of the Quality and Stability of Fats in Nutrition
  - 4.6.1. Types of Fats
  - 4.6.2. Nutritional Profile of Fats
  - 4.6.3. Quality
  - 4.6.4. Inclusion of Fat in the Diet
- 4.7. Organic Minerals in Monogastric Nutrition
  - 4.7.1. Macrominerals
  - 4.7.2. Microminerals
  - 4.7.3. Structure of Organic Minerals
- 4.8. Integrity and Intestinal Health, its Importance in Animal Nutrition
  - 4.8.1. Intestinal Physiology and Anatomy
  - 4.8.2. Intestinal Health and Digestibility
  - 4.8.3. Factors which Affect Intestinal Integrity
- 4.9. Strategies for Animal Production Without Using Growth Enhancing Antibiotics
  - 4.9.1. Effects of Antibiotics on Nutrition
  - 4.9.2. Risk of Using Antibiotics
  - 4.9.3. Global Patterns
  - 4.9.4. Formulation and Feeding Strategies
- 4.10. Concept of Precision Nutrition
  - 4.10.1. Diets *Close Up*
  - 4.10.2. Animal Models
  - 4.10.3. Ideal Protein
  - 4.10.4. Physiological Condition
  - 4.10.5. Growth Physiology

## Module 5. Nutrition and Food in Poultry

- 5.1. Broiler Chickens, Feeding Programs and Nutritional Requirements
  - 5.1.1. Genetic Evolution and Changes in Nutritional Requirements
  - 5.1.2. Food Programs
  - 5.1.3. Nutritional Requirements in the Main Genetic Lines
  - 5.1.4. Nutrition by Gender
  - 5.1.5. Nutritional Strategies to Reduce Environmental Impact
- 5.2. Special Food for Broiler Chickens
  - 5.2.1. Transport Feed (from Hatchery to Farm)
  - 5.2.2. Pre-Starter Food
  - 5.2.3. Finishing Food
- 5.3. Nutritional Strategies to Improve the Quality of a Whole Chicken
  - 5.3.1. Production Focus: Whole Chicken or Chicken Pieces
  - 5.3.2. Feeding Program for Chicken Pieces
  - 5.3.3. Nutritional Adjustments for Increased Chicken Breast Yield
  - 5.3.4. Strategies to Ensure the Quality of Fresh or Chilled Whole Chickens
- 5.4. Pullet Chickens, Feeding Programs and Nutritional Requirements
  - 5.4.1. Nutritional Program According to Age and Performance
  - 5.4.2. Nutritional Specifications of Pullet Diets
  - 5.4.3. Factors Affecting the Performance and Optimization of Nutrient Consumption
- 5.5. Pre-Laying Diet
  - 5.5.1. What is the Purpose of a Pre-Laying Diet
  - 5.5.2. Supply Period
  - 5.5.3. Nutritional Profile of the Pre-Laying Diet
  - 5.5.4. Calcium and Phosphorus in Pre-Laying Diet
- 5.6. Layer Hens, Feeding Programs and Nutritional Requirements
  - 5.6.1. Laying Stages and Characteristics
  - 5.6.2. Staged Feeding Program
  - 5.6.3. Nutritional Requirements
  - 5.6.4. Consumption Models
  - 5.6.5. Food Texture
  - 5.6.6. Egg Size

- 5.7. Nutrition and Egg Shell
  - 5.7.1. Importance of the Shell Quality
  - 5.7.2. Formation of the Shell
  - 5.7.3. Factors Which Affect a Good Quality Shell
  - 5.7.4. Nutritional Strategies and the Additives to Safeguard the Quality of the Shell
- 5.8. Confusion Matrices, Feeding Programs and Nutritional Requirements
  - 5.8.1. Development Stages of the Breeder
  - 5.8.2. Feeding Program for Chicks
  - 5.8.3. Nutritional Requirements of Chicks
  - 5.8.4. Nutritional Program for Breeding Adults
  - 5.8.5. Male Nutrition
  - 5.8.6. Nutrition and Hatchability
- 5.9. Nutritional Strategies and the Additives for the Intestinal Health of the Poultry
  - 5.9.1. Importance of Intestinal Health and Integrity
  - 5.9.2. Aspects Which Challenge the Intestinal Integrity
  - 5.9.3. Nutritional Strategies to Safeguard Intestinal Health
  - 5.9.4. Additives and Programs for Intestinal Health
- 5.10. Caloric Stress and Nutritional Strategies
  - 5.10.1. Physiology and Caloric Stress
  - 5.10.2. Nutrition and Endogenous Heat Production
  - 5.10.3. Electrolyte Balance
  - 5.10.4. Physiological Mechanisms of Heat Dissipation in Birds
  - 5.10.5. Nutritional Strategies to Help Combat Caloric Stress

## Module 6. Nutrition and Food in Pigs

- 6.1. Productive Phases and Food Programs in Pig Farming
  - 6.1.1. Gestation and Lactation
  - 6.1.2. Replacement females
  - 6.1.3. Piglet Initiation
  - 6.1.4. Raising of Commercial Pigs
  - 6.1.5. Fattening and Completion of Commercial Pigs

- 6.2. Pre-start-up Diets, Nutrition Challenges and Opportunities to Optimize Performance
  - 6.2.1. Nutritional Requirements for Piglets in Maternity and Rearing
  - 6.2.2. Digestibility of Nutrients in Piglet Diets
  - 6.2.3. Special Raw Materials
- 6.3. Simple and Complex Diets for Piglet Performance in Pre-Starting Piglets
  - 6.3.1. Simple Diets
  - 6.3.2. Expected Performance with the use of Simple Diets in Piglets
  - 6.3.3. Complex Diets
  - 6.3.4. Expected Performance with the use of Complex Diets in Piglets
  - 6.3.5. Intestinal Integrity in Piglets
- 6.4. Food Programs and Nutritional Needs of Growing Pigs
  - 6.4.1. Stages of Production in Growing Pigs
  - 6.4.2. Food for the Different Phases of Growth
  - 6.4.3. Nutritional Requirements in Growing Pigs
  - 6.4.4. Nutrition Focused on the Intestinal Integrity of Growing Pigs
- 6.5. Food Programs and Nutritional Needs of Fattening and Finishing Pigs
  - 6.5.1. Food for Fattening Pigs
  - 6.5.2. Nutritional Requirements for Fattening Pigs
- 6.6. Nutrition and Food in the First-Time Sow
  - 6.6.1. Understanding the Nutrition of a Replacement Female
  - 6.6.2. Nutritional Requirements for Replacement Females
  - 6.6.3. Nutritional Requirements for First-Time Sows
  - 6.6.4. Gestation in First-Time Sows
  - 6.6.5. Lactation in First-Time Sows
- 6.7. Nutrition and Food in the Lactating Sows
  - 6.7.1. Ad Libitum Feeding in Lactating Females
  - 6.7.2. Nutritional Requirements for Lactating Females
  - 6.7.3. Requirements According to the Size of the Litter
- 6.8. Nutrition and Food in Pregnant Sows
  - 6.8.1. Post-weaning Feeding
  - 6.8.2. Food for Different Phases During Gestation
  - 6.8.3. Nutritional Requirements for Pregnant Females

- 6.9. Interactions Between Health, Immune System and Nutrition of Pigs
  - 6.9.1. The Digestive System as Part of the Pigs Immune System
  - 6.9.2. Interaction between Nutrition and Immunity
  - 6.9.3. Nutrition Focused on Improving the Intestinal Health and Integrity
- 6.10. Alternative Nutrition to Reduce the Environmental Impact of Pig Farming
  - 6.10.1. Impact of Nutrition of the Environment
  - 6.10.2. Nutrition Focused on Reducing the Environmental Impact of Pig Slurry

## Module 7. Nutrition and Food in Canines and Felines

- 7.1. Physiology of the Digestive System of Canines and Felines (I)
  - 7.1.1. Introduction
  - 7.1.2. Functioning of the Digestive System
  - 7.1.3. Principle Differences and Similarities Between Both Species
- 7.2. Physiology of the Digestive System of Canines and Felines (II)
  - 7.2.1. Introduction
  - 7.2.2. Balanced Diet
  - 7.2.3. Factors that influence ingestion
- 7.3. Requirements
  - 7.3.1. Energy and Carbohydrates for Dogs and Cats
  - 7.3.2. Fats and Proteins
  - 7.3.3. Vitamins and minerals
- 7.4. Foods Available for Pet Animals
  - 7.4.1. Introduction
  - 7.4.2. Types of Diets
  - 7.4.3. Owner's Interpretation of the Label
- 7.5. Nutrition for Different Stages of Life (I)
  - 7.5.1. Introduction
  - 7.5.2. Maintenance for Adults
  - 7.5.3. Food for Puppies
- 7.6. Nutrition for Different Stages of Life (II)
  - 7.6.1. Reproduction and Lactation
  - 7.6.2. Food for Pets of an Advanced Age
  - 7.6.3. A Special Case. Food for Racing Dogs



- 7.7. Pathologies Derived from Nutrition and their Treatments (I)
  - 7.7.1. Introduction
  - 7.7.2. The Obese Patient
  - 7.7.3. The Underweight Patient
- 7.8. Pathologies Derived from Nutrition and their Treatments (II)
  - 7.8.1. Cardiac Patient
  - 7.8.2. Renal Patient
  - 7.8.3. Liver patient
- 7.9. Pathologies Derived from Nutrition and their Treatments (II)
  - 7.9.1. Gastrointestinal Problems
  - 7.9.2. Skin Diseases
  - 7.9.3. Diabetes Mellitus
- 7.10. Nutritional Management in Extreme Situations
  - 7.10.1. Introduction
  - 7.10.2. Food for a Sick Patient
  - 7.10.3. Intensive Care Nutritional Support

## Module 8. Nutrition and Food in Ruminants

- 8.1. Digestion and Ruminal Process in Bovines
  - 8.1.1. Anatomy of the Digestive System of a Ruminant
  - 8.1.2. Physiology and Importance of Rumination
  - 8.1.3. Ruminal Microorganisms and their Importance
  - 8.1.4. Digestion of Carbohydrates in Rumen
  - 8.1.5. Digestion of Fats in Rumen
  - 8.1.6. Digestion of Nitrogen Compounds in Rumen
- 8.2. Digestion and Post-ruminal Metabolism
  - 8.2.1. Post-ruminal Digestion of Carbohydrates, Lipids and Proteins
  - 8.2.2. Absorption of Nutrients in the Ruminant
  - 8.2.3. Metabolism of Carbohydrates, Lipids and Proteins in Ruminants

- 8.3. Protein Requirements
  - 8.3.1. Methodology for Protein Titration in Ruminants
  - 8.3.2. Maintenance Requirements
  - 8.3.3. Gestation Requirements
  - 8.3.4. Milk Production Requirements
  - 8.3.5. Growth Requirements
- 8.4. Energy Requirements
  - 8.4.1. Methodology of Energetic Valuation in Ruminants
  - 8.4.2. Maintenance Requirements
  - 8.4.3. Gestation Requirements
  - 8.4.4. Milk Production Requirements
  - 8.4.5. Growth Requirements
- 8.5. Fiber Requirements
  - 8.5.1. Fiber Valuation Methods
  - 8.5.2. Fiber Requirements for Maintaining Good Health and Production in Ruminants
- 8.6. Mineral and Vitamin Requirements
  - 8.6.1. Hydrosoluble Vitamins
  - 8.6.2. Liposoluble Vitamins
  - 8.6.3. Macrominerals
  - 8.6.4. Microminerals
- 8.7. Water, Requirements and Factors which Affect its Consumption
  - 8.7.1. Importance of Water in the Production of Ruminants
  - 8.7.2. Water Quality for Ruminants
  - 8.7.3. Water Requirements for Ruminants
- 8.8. Nutrition and Food in Lactating Ruminants
  - 8.8.1. Physiology of Esophageal Leakage
  - 8.8.2. Requirements in Lactating Ruminants
  - 8.8.3. Diet Design for Lactating Ruminants

- 8.9. Main Foods in Diets for Ruminants
  - 8.9.1. Fibrous Foods
  - 8.9.2. Energy Rich Foods
  - 8.9.3. Protein Rich Foods
  - 8.9.4. Vitamin Supplements
  - 8.9.5. Mineral Supplements
  - 8.9.6. Additives and Others
- 8.10. Dietary Formulation and Supplements for Bovines
  - 8.10.1. Requirement Calculations
  - 8.10.2. Ration Balancing Methods
  - 8.10.3. Dietary Formulation for Beef Cattle
  - 8.10.4. Dietary Formulation for Dairy Cattle
  - 8.10.5. Dietary Formulation for Sheep and Goats

## Module 9. Additives in Animal Food

- 9.1. Definitions and Types of Additives Used in Animal Food
  - 9.1.1. Introduction
  - 9.1.2. Classification of Additive Substances
  - 9.1.3. Additives for Quality
  - 9.1.4. Performance Enhancing Additives
  - 9.1.5. Nutraceuticals
- 9.2. Anticoccidials and Growth Promoting Antibiotics
  - 9.2.1. Types of Anticoccidials
  - 9.2.2. Anticoccidials Programs
  - 9.2.3. Growth-Promoting Antibiotics and Purposes of Use
- 9.3. Enzymes
  - 9.3.1. Phytases
  - 9.3.2. Carbohydrases
  - 9.3.3. Proteases
  - 9.3.4. Mananasa Beta

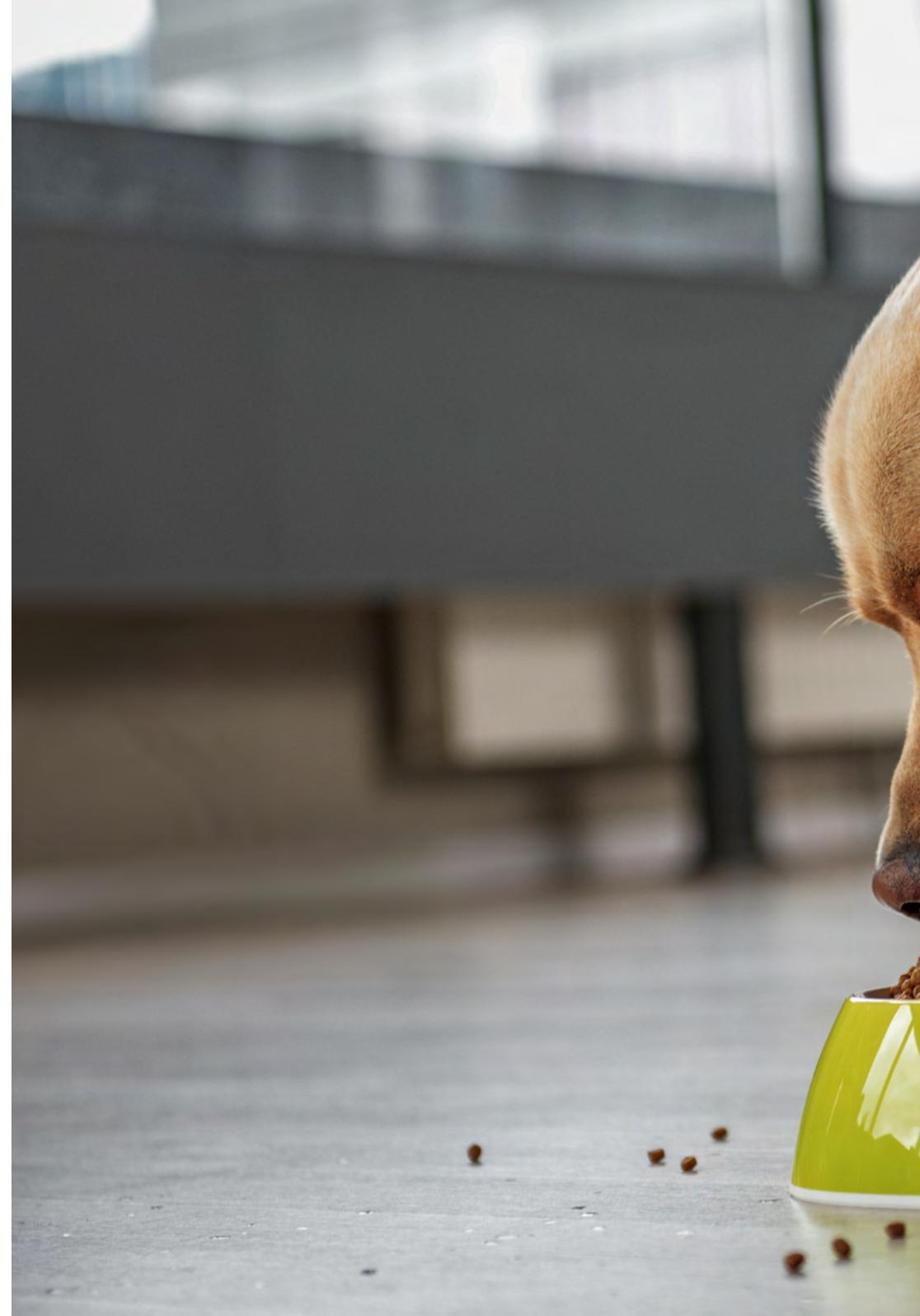
- 9.4. Antifungals and Mycotoxin Binders
  - 9.4.1. Importance of Fungal Contamination
  - 9.4.2. Types of Fungi that Contaminate Grains
  - 9.4.3. Substances with Antifungal Characteristics
  - 9.4.4. What are Mycotoxins?
  - 9.4.5. Types of Mycotoxins
  - 9.4.6. Types of Binders
- 9.5. Acidifiers and Organic Acids
  - 9.5.1. Objectives and Approaches to the Use of Acidifiers in Poultry and Swine
  - 9.5.2. Types of Acidifiers
  - 9.5.3. What are Organic Acids
  - 9.5.4. Main Organic Acids Used
  - 9.5.5. Mechanisms of action
  - 9.5.6. Technological Characteristics of Acidifiers
- 9.6. Antioxidants and Pigmenting Agents
  - 9.6.1. Importance of Antioxidants in Balanced Foods and Veterinary Nutrition
  - 9.6.2. Natural and Synthetic Antioxidants
  - 9.6.3. How Antioxidants Work
  - 9.6.4. Pigmentation in the Egg and the Chicken
  - 9.6.5. Pigment Sources
- 9.7. Probiotics, Prebiotics, and Symbiotics
  - 9.7.1. Differences between Probiotics, Prebiotics, and Symbiotics
  - 9.7.2. Types of Probiotics and Prebiotics
  - 9.7.3. Approaches and Strategies of Use
  - 9.7.4. Benefits of Poultry and Pig Farming
- 9.8. Odor Control Products
  - 9.8.1. Air Quality and Ammonia Control in Poultry Farming
  - 9.8.2. Yucca Shidigera
  - 9.8.3. Odour Controls in Pig Farming

- 9.9. Phytochemicals
  - 9.9.1. What are Phytochemical Substances
  - 9.9.2. Types of Phytochemical Substances
  - 9.9.3. Procurement Processes
  - 9.9.4. Mechanisms of action
  - 9.9.5. Essential Oils
  - 9.9.6. Flavonoids
  - 9.9.7. Pungent Substances, Saponins, Tannins and Alkaloids
- 9.10. Bacteriophages and Other New Technologies
  - 9.10.1. What are Bacteriophages ?
  - 9.10.2. Recommendations for Use
  - 9.10.3. Proteins and Bioactive Peptides
  - 9.10.4. Egg Immunoglobulins
  - 9.10.5. Additives for the Correction of Process Losses

## Module 10. Manufacturing of Balanced Foods: Processes, Quality Control and Critical Points

- 10.1. From Formula to Food Processing, Aspects to be Considered
  - 10.1.1. What is a Balanced Food Formula and What Information Should it Contain
  - 10.1.2. How to Read and Analyze a Balanced Food Formula
  - 10.1.3. Preparation of Raw Materials and Additives
  - 10.1.4. Equipment Preparation
  - 10.1.5. Basic Analysis of Manufacturing Costs of Balanced Foods
- 10.2. Storage of Cereals
  - 10.2.1. Reception Process of Raw Materials
  - 10.2.2. Sampling of Raw Materials
  - 10.2.3. Basic Analysis upon Reception
  - 10.2.4. Types of Storage and Characteristics
- 10.3. Storage of Liquids and Animal By-products
  - 10.3.1. Liquid Products and Handling and Storage Characteristics
  - 10.3.2. Dosage of Liquid Products
  - 10.3.3. Control Regulations and Storage of Animal By-products

- 10.4. Steps in the Process for Making Balanced Foods
  - 10.4.1. Weighing
  - 10.4.2. Milling
  - 10.4.3. Mixing
  - 10.4.4. Addition of Liquids
  - 10.4.5. Conditioning
  - 10.4.6. Pelletizing
  - 10.4.7. Cooling
  - 10.4.8. Packaging
  - 10.4.9. Other Processes
- 10.5. Milling and the Nutritional Consequences
  - 10.5.1. Purpose of Milling
  - 10.5.2. Types of Mills
  - 10.5.3. Efficiency of Milling
  - 10.5.4. Importance of Particle Size
  - 10.5.5. Effects of Particle Size on the Zootechnical Performance of Birds and Pigs
- 10.6. Mixing, Uniformity and the Nutritional Consequences
  - 10.6.1. Types of Mixers and Characteristics
  - 10.6.2. Stages in the Process of Mixing
  - 10.6.3. Importance of the Process of Mixing
  - 10.6.4. Coefficient Variation of Mixing and Methodology
  - 10.6.5. Effects of a Bad Mix on the Animal Performance
- 10.7. Pelletization, Quality and the Nutritional Consequences
  - 10.7.1. Purpose of Pelletization
  - 10.7.2. Phases in the Process of Pelletizing
  - 10.7.3. Types of Pellets
  - 10.7.4. Factors which Affect and Benefit the Success of the Process
  - 10.7.5. Pellet Quality and Effects on the Zootechnical Performance





- 10.8. Other Machines and Equipment Used in the Balancing Industry
  - 10.8.1. Sampling Probes
  - 10.8.2. Quarters
  - 10.8.3. Moisture Meters
  - 10.8.4. Sieve
  - 10.8.5. Densimetric tables
  - 10.8.6. Hopper Scale
  - 10.8.7. Mill Batchers
  - 10.8.8. Post-pellets Applications
  - 10.8.9. Monitoring Systems
- 10.9. Forms and Types of Feed Offered by Balanced Feed Plants
  - 10.9.1. Flour Foods
  - 10.9.2. Pelletized Foods
  - 10.9.3. Extruded Food
  - 10.9.4. Wet Food
- 10.10. Control Quality Control and Critical Points Control
  - 10.10.1. Quality Administration in the Plant
  - 10.10.2. Good Practices in Food Production
  - 10.10.3. Quality Control of Raw Materials
  - 10.10.4. Production Process and Finished Product
  - 10.10.5. Risk and Critical Control Point Analysis (HACCP)



*Establish as the elite of the sector, the nutritional requirements of the main species destined to the production of animal protein"*

07

# Clinical Internship

After passing the for online teaching period, the program includes an internship program period in a reference clinical center. The student will have at their disposal the support of a tutor who will accompany them during the whole process, both in the preparation and in the development of the clinical practice.





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*Include in your resume a Hybrid Professional Master's Degree in Veterinary Nutrition and boost your professional possibilities in the sector"*

The Internship Program of this program in Veterinary Nutrition consists of a practical stay in high level veterinary centers of 3 weeks duration, from Monday to Friday with 8 consecutive hours of practical training with an assistant specialist. This stay will allow you to see real cases alongside a professional team of reference in the veterinary area, applying the most innovative procedures of last generation.

In this training proposal, completely practical in nature, the activities are aimed at the development and improvement of the skills necessary for the provision of veterinary care in areas and conditions that require a high level of qualification, and which are oriented to the specific training for the exercise of the activity, in a safe environment and high professional performance.

It is undoubtedly an opportunity to learn by working with the best teams of veterinarians in veterinary nutrition at the national and international level. All this makes this training the ideal teaching scenario for this innovative experience in the improvement of professional veterinary skills for the 21st century.

The practical part will be carried out with the active participation of the student performing the activities and procedures of each area of skills (learning to learn and learning to do), with the accompaniment and guidance of teachers and other fellow trainees who facilitate teamwork and multidisciplinary integration as transversal skills for of nursing clinical practice (learning to be and learning to relate).

The procedures described below will be the basis of the practical part of the training, and their realization is subject to both the suitability of the patients and the center's own availability and workload, the proposed activities being the following:



*Receive specialized education in an institution that can offer you all these possibilities, with an innovative academic program and a human team that will help you develop your full potential"*



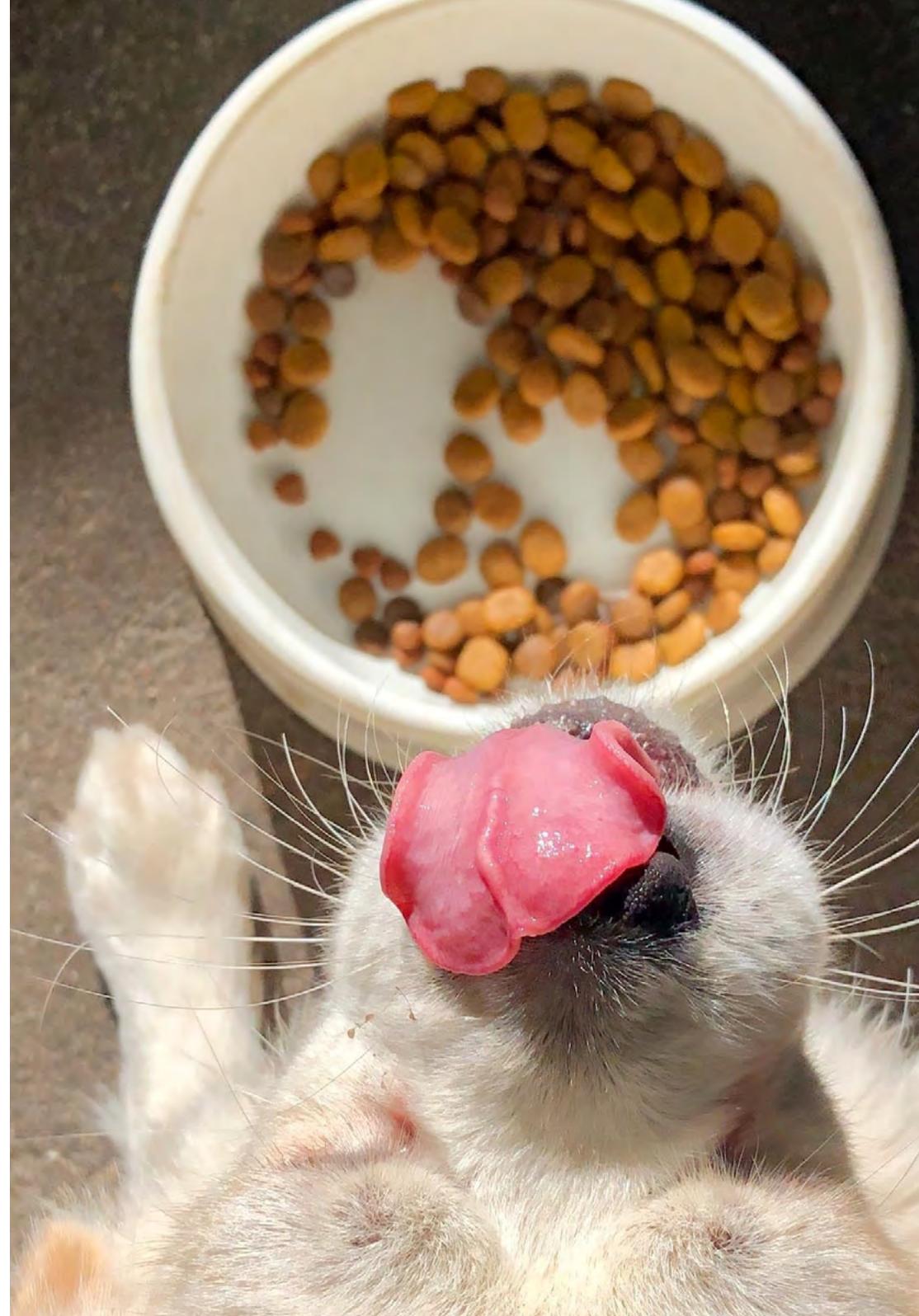
Module	Practical Activity
<b>Chemical Composition of Food and Quality of the Raw Materials for Ruminants and Non-Ruminants</b>	Apply methods of assessing the nutritional value of foods, their fat energy and oils
	Perform analysis of protein and amino acid content of feed ingredients and their digestibility
	Verify the analysis of other nutrients of importance in Veterinary Nutrition: minerals and microminerals, vitamins, fiber and water
	Analyze raw materials used in ruminant and non-ruminant feed: fresh forages (greens), preserved forages and energy and protein concentrates
	Evaluate different feeding possibilities for ruminants and non-ruminants
<b>Digestibility, Ideal Protein and Advances in Veterinary Nutrition</b>	Evaluate the metabolism of carbohydrates, lipids, proteins, vitamins and minerals and water
	Perform protein metabolism testing in poultry and swine
	Analyze nutrient and synthetic amino acids in veterinary nutrition
	Evaluate organic minerals in monogastric nutrition: macrominerals and microminerals
	Perform intestinal integrity and intestinal health analysis
	Perform precise nutrition testing
<b>Nutrition and feeding of swine, poultry, canines, felines and ruminants</b>	Formulate diets and supplements after testing feeding programs and nutritional requirements of growing pigs and finishing and fattening pigs, as well as gilts and lactating sows
	Formulate diets and supplements after testing feeding programs and nutritional requirements of broilers, pullets and layers
	Perform nutrition and eggshell quality examination
	Examine available pet foods and evaluate nutrition according to life stage
	Verify pathologies derived from nutrition and their treatment: obese patient, reduced weight patient, cardiac patient, renal patient, hepatic patient, or with gastrointestinal problems, skin diseases and diabetes mellitus
	Examine the water. Verify requirements and factors that affect its consumption
<b>Manufacturing of Balanced Foods: Processes, Quality Control and Critical Points</b>	Analyze the formula for the elaboration, conservation and storage of feed, liquids and animal by-products
	Perform the examination of steps in the feed manufacturing process: weighing, milling, mixing, liquid addition, conditioning, pelleting, cooling, packaging and other processes
	Perform different types of tests that will help to determine the quality and nutritional consequences on the animal and critical control points
	Examine the additives used in animal feed, forms and types of feed, as well as all the processes and technologies applied to improve the quality of the final product to be obtained
	Apply anticoccidials and antibiotic growth promoters

## Civil Liability Insurance

This institution's main concern is to guarantee the safety of the trainees and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

To this end, this entity commits to purchasing a civil liability insurance policy to cover any eventuality that may arise during the course of the internship at the center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the Internship Program period. That way professionals will not have to worry in case of having to face an unexpected situation and will be covered until the end of the internship program at the center.



## General Conditions of the Internship Program

The general terms and conditions of the internship agreement for the program are as follows:

**1. TUTOR:** During the Internship Program, students will be assigned two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned an academic tutor whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the professional will be accompanied at all times and will be able to consult any doubts that may arise, both of a practical and academic nature.

**2. DURATION:** The internship program will have a duration of three continuous weeks, in 8-hour days, 5 days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

**3. ABSENCE:** If the student does not show up on the start date of the Internship Program, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

**4. CERTIFICATION:** The student who passes the Hybrid Professional Master's Program will receive a certificate accrediting their stay at the center.

**5. EMPLOYMENT RELATIONSHIP:** The Hybrid Professional Master's Program shall not constitute an employment relationship of any kind.

**6. PRIOR EDUCATION:** Some centers may require a certificate of prior education for the Internship Program. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

**7. DOES NOT INCLUDE:** the Hybrid Professional Master's Program will not include any element not described in these conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed.

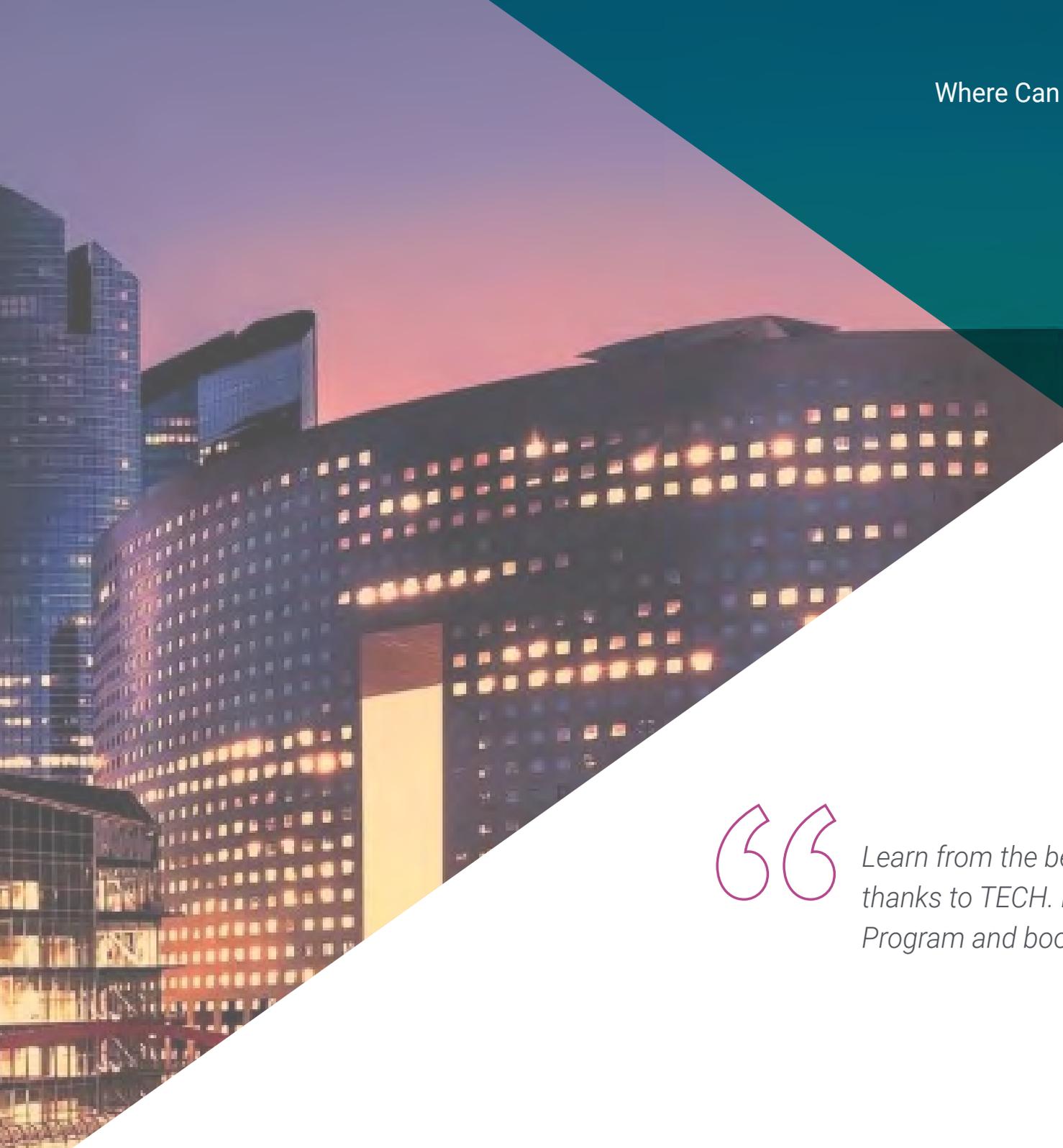
However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

# 08

## Where Can I Do the Clinical Internship?

In its maxim of offering a unique experience to students in the development of their skills, TECH offers them the opportunity to put into practice the theoretical knowledge they have learned about animal nutrition in a specialized veterinary center. In this way, they specialize alongside the best veterinary nutritionists, propelling their career to the highest level of this veterinary field. Additionally, our institution adapts to the needs and preferences of the student, allowing them to choose the destination that best suits their needs.





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*Learn from the best veterinary nutritionists thanks to TECH. Bet on this Internship Program and boost your job opportunities"*



The student will be able to do this program at the following centers:



### Centro Veterinario San Antón

Country: Spain  
City: Madrid

Address: Avenida de la Libertad, 93. Local 14-16, 28770 Colmenar Viejo

Veterinary Center offering personalized attention to different animal species.

**Related internship programs:**  
-Veterinary Anesthesiology  
-Veterinary Cardiology in Small Animals



### Vet Nutrition Center-Madrid

Country: Spain  
City: Madrid

Address: Av. de Menéndez Pelayo, 23, Madrid

Center specialized in Animal Nutrition and Digestive and Metabolic Pathologies

**Related internship programs:**  
-Veterinary Nutrition



### Zoológico El Bosque

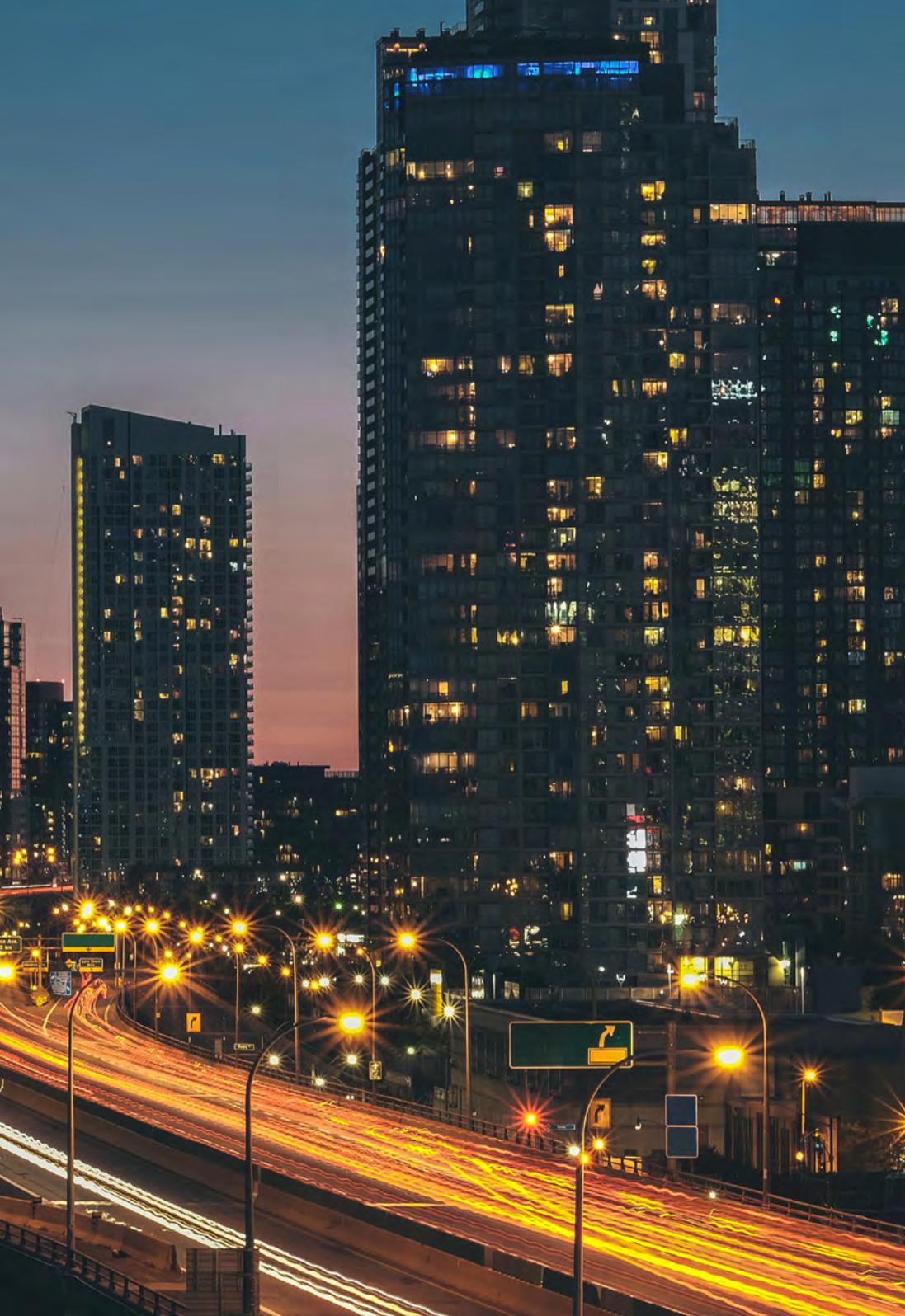
Country: Spain  
City: Asturias

Address: Los Molinos, 19, 33195 San Esteban de las Cruces, Asturias

Zoo specialized in rescue and recovery of exotic species

**Related internship programs:**  
-Animal Welfare  
-Veterinary Nutrition





Pharmacodynamics.

### Happy Can Camp

Country	City
Mexico	Puebla

Address: Km 4.5 lateral Recya a Cholula Col.  
Bella Horizonte Puebla C.P. 72170

Veterinary clinic and hotel

**Related internship programs:**

- Veterinary Radiology in Small Animals
- Veterinary Ophthalmology in Small Animals



Pharmacodynamics.

### Veterinaria Palo Verde

Country	City
Mexico	Mexico City

Address: Cerro del Otate 20, Romero  
de Terreros, Coyoacán, 04310 Ciudad  
de México, CDMX

Clinical Veterinary with more than 30 years  
of experience in care of pets

**Related internship programs:**

- Internal Medicine in Small Animals
- Animal Welfare



### SAVET Sanatorio Veterinario

Country	City
Argentina	Río Negro

Address: Santa Cruz 1515 General Roca,  
Río Negro

Veterinary clinic with supplies and materials  
of the latest generation

**Related internship programs:**

- Veterinary Anesthesiology
- Veterinary Emergencies in Small Animals



### Clínica Veterinaria Don Bosco

Country	City
Argentina	Buenos Aires

Address: Conquista de Desierto 662,  
Ezeiza, Bs. As

Clinic of general and specific specialties of Veterinary  
Medicine

**Related internship programs:**

- Veterinary Anesthesiology
- Veterinary Emergencies in Small Animals





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*Take advantage of this opportunity to surround yourself with expert professionals and benefit from their work methodology”*

09

# 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.





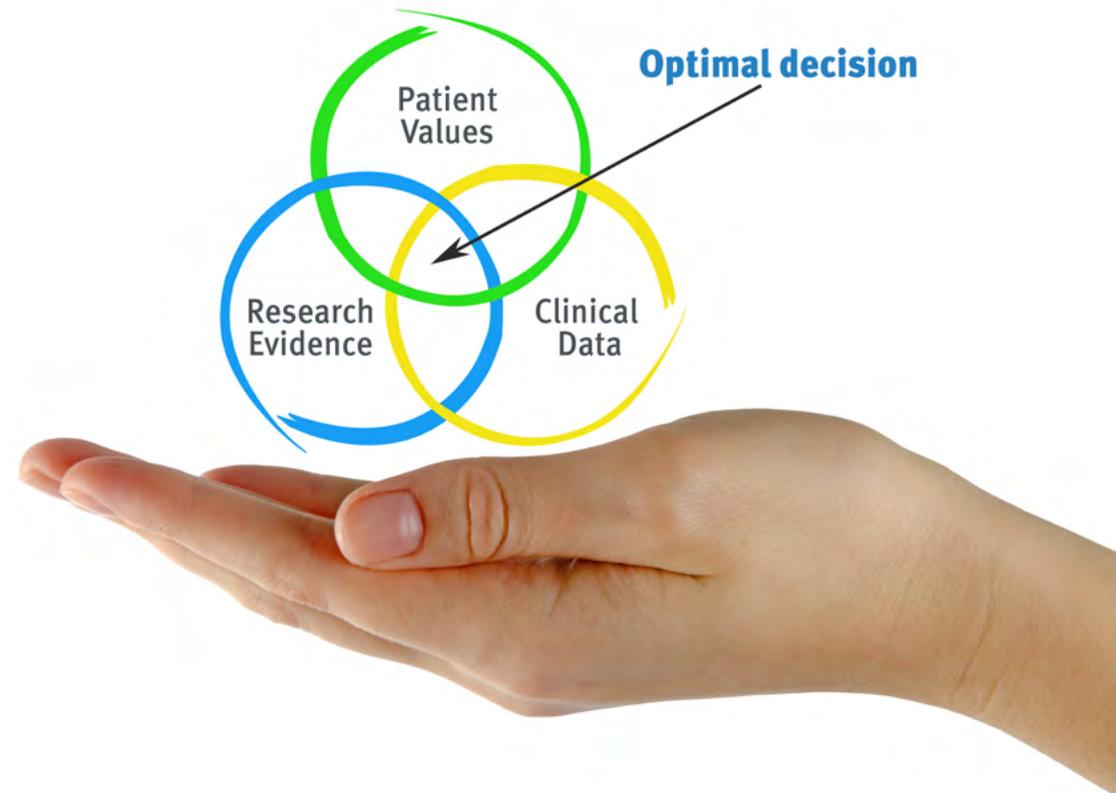
“

*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. Gervas, 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

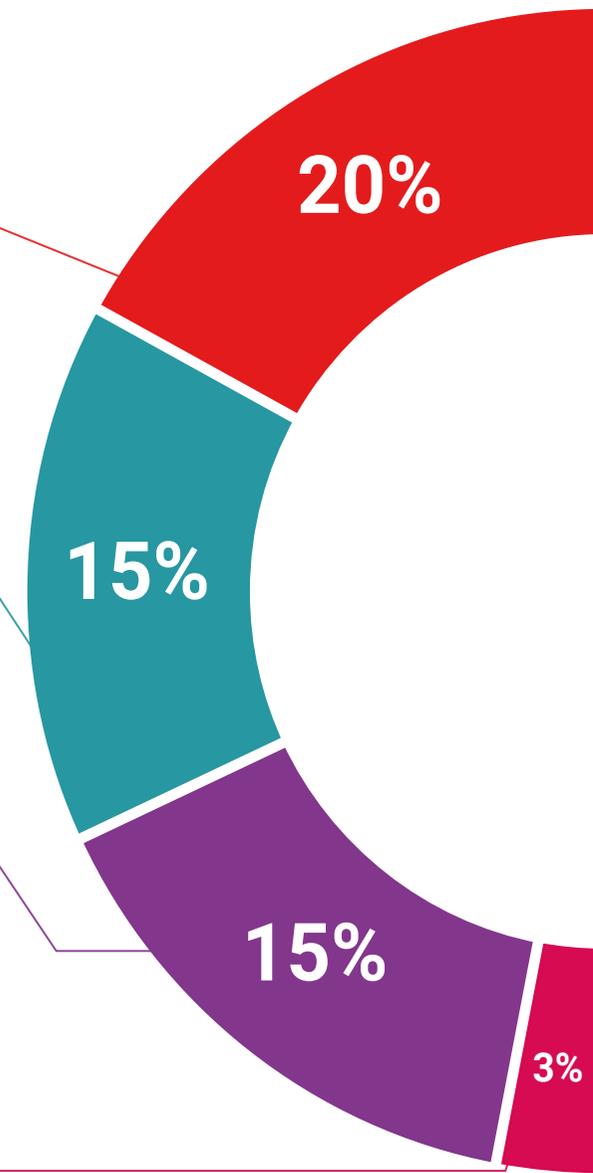
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

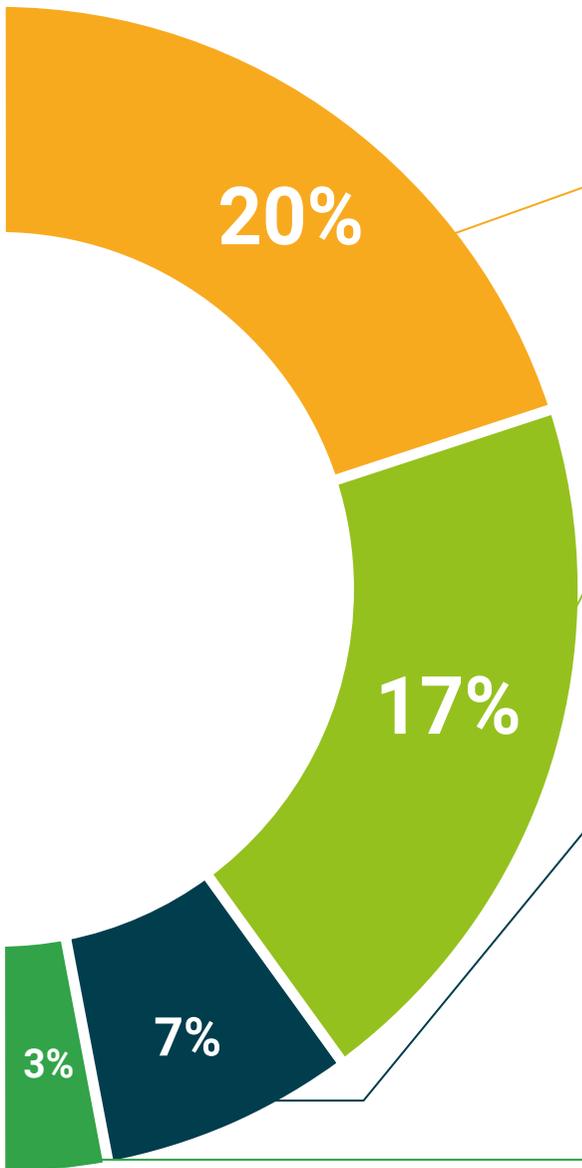
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### 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.



# 10 Certificate

The Hybrid Professional Master's Degree in Veterinary Nutrition guarantees, in addition to the most rigorous and updated training, access to a Hybrid Professional Master's Degree issued by TECH Technological University.



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

This **Hybrid Professional Master's Degree in in Veterinary Nutrition** contains the most complete and updated program in the professional and academic panorama.

After the student has passed the evaluations, they will receive their corresponding TECH Hybrid Professional Master's Degree issued by TECH Technological University via tracked delivery.

In addition to the diploma, students will be able to obtain an academic transcript, as well as a certificate outlining the contents program. In order to do so, students should contact their academic advisor, who will provide them with all the necessary information.

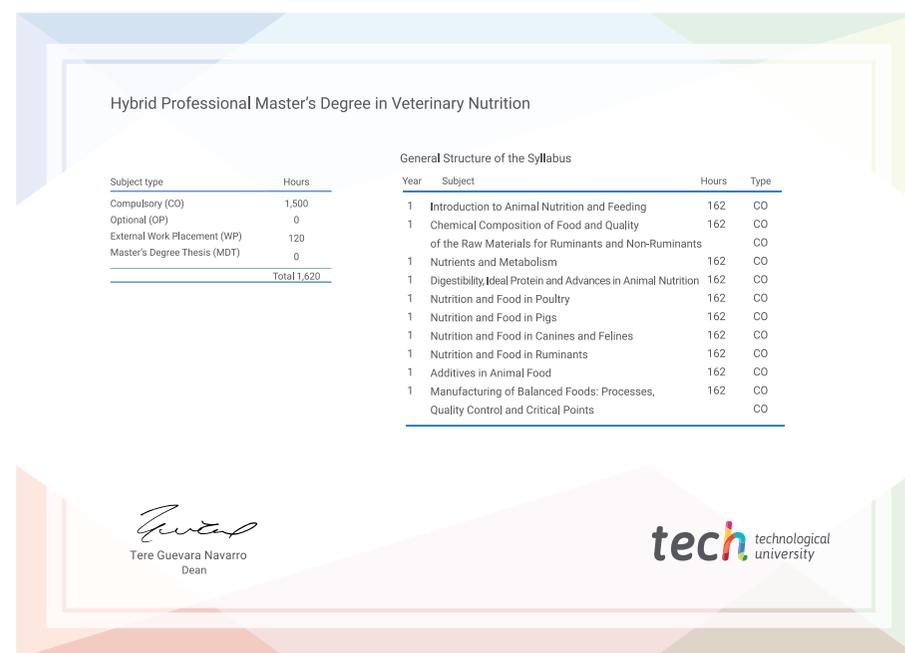
Title: **Hybrid Professional Master's Degree in Veterinary Nutrition**

Modality: **Hybrid (Online + Clinical Internship)**

Duration: **12 months**

Certificate: **TECH Technological University**

Teaching Hours: **1,620 h.**



\*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH EDUCATION 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



## Hybrid Professional Master's Degree

### Veterinary Nutrition

Modality: Hybrid (Online + Clinical Internship)

Duration: 12 months

Certificate: TECH Technological University

Teaching Hours: 1,620 h.

# Hybrid Professional Master's Degree Veterinary Nutrition

