



International Master in Animal Nutrition

VIII Edition
(September 2021-June 2023)



Universidad
Zaragoza





10 Reasons for studying this Master

1.

Animal nutrition is one of the main bases of livestock production, therefore specialist training is required to produce safe, quality food products and design sustainable production systems.

2.

An innovative programme providing in-depth knowledge of nutrition systems for cattle, sheep, pigs, goats, poultry and rabbits through analysis of modern and sustainable techniques and methods.

3.

A multidisciplinary programme delivered by more than 60 qualified professionals from 8 countries, chosen for their expertise and reputation.

4.

A comprehensive teaching system combining lectures, practicals, individual tutored work and visits to livestock farms, businesses and research centres.

5.

A professional traineeship at a firm in the agro-food production or animal nutrition sector, a livestock farm or a public institution.

6.

The Final Master Project of the second year is conducted at a national or international university, research centre or firm.

7.

92% of alumni from recent editions are already working in fields related to the Master or preparing a doctoral thesis.

8.

An opportunity to build up an international network of contacts and collaborators, an essential factor of differentiation in today's competitive job market.

9.

Official qualifications awarded by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM) and the University of Zaragoza (UZ).

10.

The Master is accredited by the Aragon Agency of Quality Assurance (ACPUA).



About Us

CIHEAM Zaragoza

CIHEAM Zaragoza is one of the four Institutes of the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), together with the Institutes of Bari in Italy, Montpellier in France and Chania in Greece.

CIHEAM is an intergovernmental organization founded **over 50 years ago** under the aegis of the **Council of Europe** and the **OECD** whose mission is to develop cooperation between the countries of the Mediterranean through postgraduate training and cooperative research in the agro-food and fisheries sectors and the environment.

CIHEAM Zaragoza was created in **1969**, offering high-quality training and promoting research and international cooperation through project management in five thematic areas: Animal Production; Fisheries and Aquaculture; the Environment; Plant Production; and Food Technology and Agro-Food Marketing.

CIHEAM Zaragoza has become consolidated as a leader in international specialist training in the agro-food sector. It is situated on the Campus of Aula Dei, one of the largest and most prestigious agricultural science complexes in Spain, thus enhancing the generation of synergies within the scientific community, business and students.

UNIVERSITY OF ZARAGOZA (UZ)

The university dates back over four centuries and has more than 35000 students and 3500 lecturers each year, making it a university of national and international reference thanks to its reputation in research and quality service.

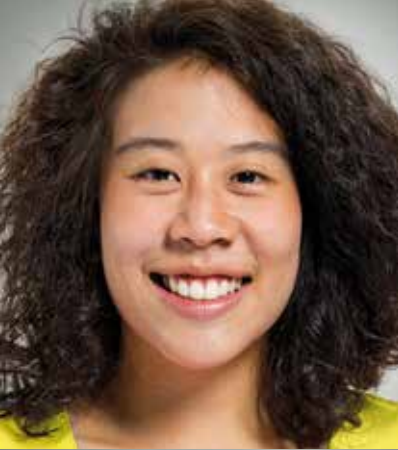
The **Faculty of Veterinary Science** was founded in 1847 and is one of the oldest in Spain. Its modern infrastructures stand in its own 8-hectare campus. Undergraduate degrees in Veterinary Science and Food Science and Technology are offered, as well as official Master degrees and three Doctorate programmes, two of which are related to agriculture and food science.

THE SPANISH FOUNDATION FOR THE DEVELOPMENT OF ANIMAL NUTRITION (FEDNA)

The Spanish Foundation for the Development of Animal Nutrition (**FEDNA**) is a non-profit education centre created in 1989. The mission of FEDNA is to publicize the latest scientific advances in animal nutrition and feeding throughout Spain and strengthen ties between University and Business through the exchange of information services and the integration of students in firms of the animal nutrition sector. The Foundation also draws up Spanish feed composition tables and awards the **FEDNA prize** for young researchers.







15 000
students



170
publications



60
nationalities
among lecturers
and students



50
years of
experience



60
agreements with
national and
international
organizations





10 000
guest lecturers



6700
scholarships



40
research projects
and networks



8
MSc programmes

400
courses for
professionals





Organization

The Master in Animal Nutrition is an official master of two years' duration (120 ECTS), delivered in Zaragoza and jointly organized by **CIHEAM Zaragoza**, **the University of Zaragoza (UZ)** and the

Spanish Foundation for the Development of Animal Nutrition (FEDNA), with the collaboration of the **Polytechnic University of Madrid (UPM)**.



Scientific Coordinator
Manuel Fondevila, PhD.

University of Zaragoza
Dept Animal Production
and Food Science.



Academic Coordinator
Andrés Schlageter, PhD.

CIHEAM Zaragoza

Year One

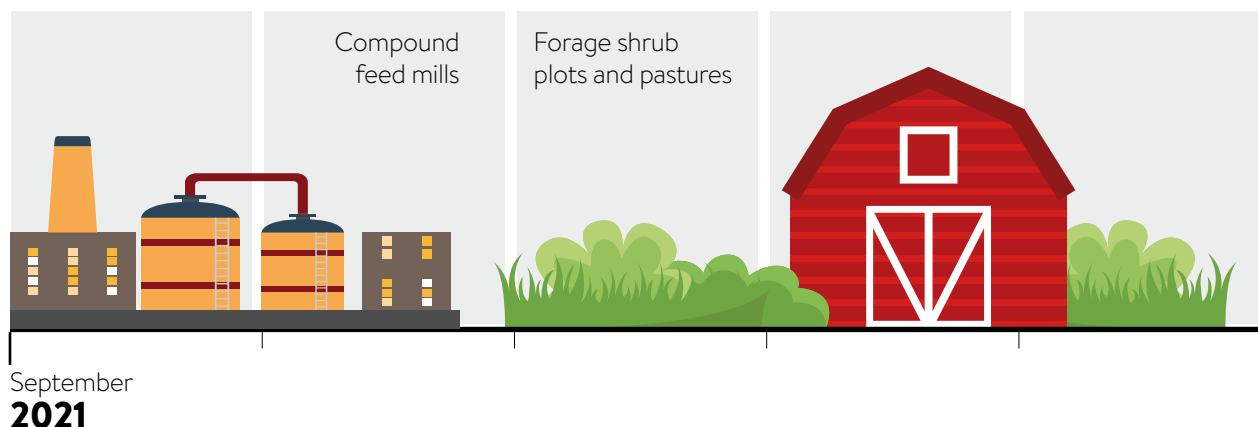
The Master is designed to train professionals in the field of animal nutrition. During the first year (60 ECTS) students attend lectures and tutorials, laboratory and IT practicals to learn to design animal feed programmes and participate in technical visits to various livestock farms.

During this time students have the opportunity to design a project on new techniques or methodologies in animal nutrition and apply them in a productive context.

The Master is flexible and students can take independent modules.

Lectures are delivered in English, French or Spanish with simultaneous interpretation. Furthermore, for students that do not have a basic knowledge of Spanish, an intensive course is offered from July to September, to facilitate their adaptation to the CIHEAM Zaragoza Experience.

The Master includes **at least 16 technical visits to:** compound feed mills, forage shrub plots and pastures, beef and dairy cattle farms, meat and dairy sheep farms, extensive and intensive systems, goat farms, an organic production system, poultry, pig and rabbit farms and milk recording and quality control laboratories.



Programme Year one

Principles of
animal nutrition

12 ECTS

Animal feeding
and food quality
and safety

15 ECTS

Repercussions of
nutrition on the
environment and
on animal health
and welfare

6 ECTS

Individual
project

6 ECTS

Livestock feed and feed
manufacture technology:
composition,
quality and safety

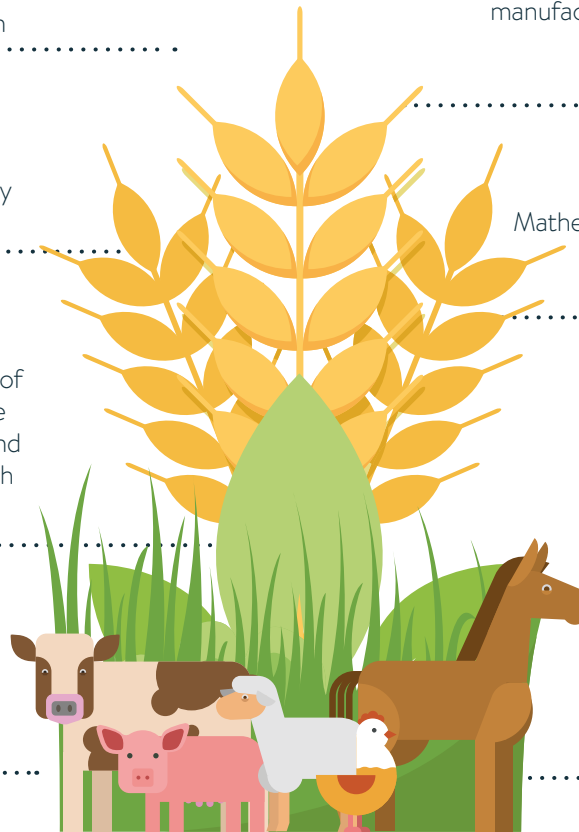
9 ECTS

Mathematical methods
and statistics in
animal nutrition

6 ECTS

Professional
traineeship
related to
animal nutrition

6 ECTS



Year two

Introduction
to Research

30 ECTS



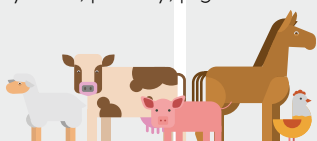
Final
Master
Project

30 ECTS

Beef and dairy cattle farms,
meat and dairy sheep farms,
extensive and intensive systems,
goat farms, an organic production
system, poultry, pig and rabbit farms

Milk recording and quality
control laboratories

Traineeship
in Firms



At least 16 technical visits

May
2022

July
2022

Web Master: www.masteranimalnutrition.com



Traineeship in Firms and Institutions

In the last month of year one, students do a professional traineeship in the feed mill industry, a quality control laboratory, a livestock farm or similar centre related to the animal nutrition or agro-food product sectors.

Firms or centres offering traineeships in 2018.



“The traineeship experience has been a very important aspect for me and without a doubt has completed my academic training. It has enabled me to apply the knowledge acquired during the course and prepared me to overcome challenges I may face in my professional career”.

Rebeca Oliver, 2016 (Spain)

Objectives of the Master



The Master leads students to reach the following objectives:

- 1** To become acquainted with the scientific principles and fundamental mechanisms of modern animal nutrition, as well as the relevant methods and techniques that contribute to more efficient processes.
- 2** To learn how to bring together the different components of an animal nutrition programme for sustainable production and safe, quality foods of animal origin.
- 3** To be capable of planning and implementing animal nutrition programmes in different conditions and surroundings.
- 4** To know how to design a nutrition programme for a chosen specie, applied to a given production system and local conditions.
- 5** To commence research work, and critically apply the knowledge, skills and competences acquired to deal with real issues related to animal nutrition.
- 6** To master the scientific and technical information related to the research, acquire skills in the use of relevant research techniques and methodologies and be capable of making an objective assessment of the significance of results and conclusions.
- 7** To acquire the necessary skills to transmit the reasons and conclusions of tutored individual or group work to prepare informative or synthesis documents and present oral communications.



Year Two

In year two of the programme (60 ECTS) students go on to do their Practicum and Final Master Project at national or international universities, research centres or firms. The collaboration with these institutions is fundamental for the success of the programme.

Students receive training in an environment of team research work, and benefit from excellent resources and sound advice. The experience acquired during this period goes beyond the acquisition of knowledge and practical skills. It provides a full introduction to the reality of the professional world.

Partner Centres



Final Master Project host centres 2019-2021.

Final Master Projects



Manel Ben Khedim (Tunisia)

“Economic analysis and efficiency of Assaf and Awassi dairy sheep farms in Castilla y León, Spain”
2007-2008 edition.



Candelaria Ferrer Somaré (Argentina)

“Effect of the soybean oil level on the intake and digestion of steers fed sorghum silage”
2010-2011 edition.



Laia Biavi Josa (Spain)

“Maternal learning and creep-feeding: two strategies determining post-weaning performance of piglets”
2012-2013 edition.



Carolina Pineda Quiroga (Colombia)

“Evaluation of parameters of rumen fermentation and methane emissions in representative rations of different dairy sheep production systems in the Autonomous Community of the Basque Country”
2012-2013 edition.



Neus Torrent Ample (Spain)

“Effect of barley β -glucan supplementation on milk production and digestive and metabolic parameters in dairy ewes” 2014-2015 edition.

Prize for the best Final Master Project of the University of Zaragoza



Laurent Bonnal (France)

“Evaluation de la qualité des régimes alimentaires consommés par les bovins sur parcours par l’analyse des fèces par SPIR”
2016-2017 edition.



Sandra Costa Roura (Spain)

“Impact of forage type and crude protein restriction on productive performance and metabolic profile in feedlot Holstein calves” 2016-2017 edition.



Ibtissam Nejjam (Morocco)

“Focus on the use of ruminal microbiota as pro and prebiotic to optimize rumen development and the efficient use of forage or concentrated diets”
2016-2017 edition.

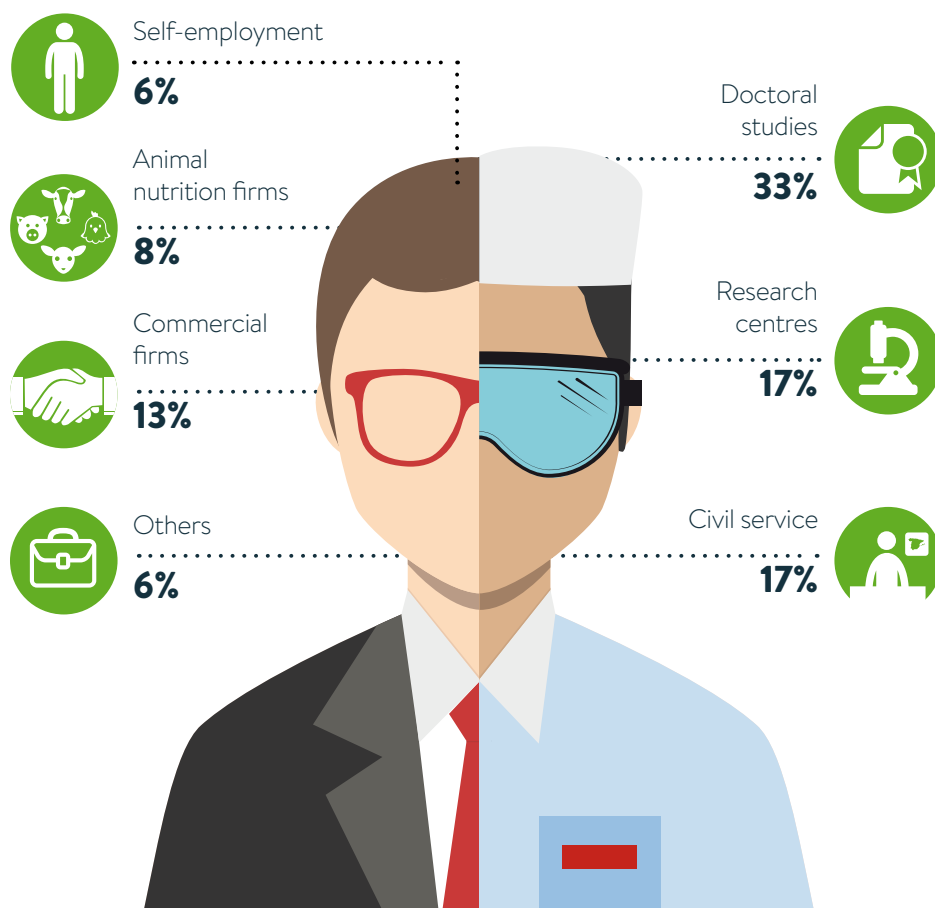


Career Opportunities

The Master in Animal Nutrition offers students a versatile range of career opportunities as the specialist nature of the degree qualifies students to assume technical responsibilities as well as conduct scientific research in the following domains:

- The compound feed, additive and biotechnology industries.
- Livestock farms; planning and supervising animal nutrition.
- Technical advisory services for farms, cooperatives and industries.
- Institutions and public administrations.

Alumni employment since the 2014 edition



Source: Master alumni monitoring report drawn up by the UZ/ CIHEAM Zaragoza Studies Commission (2014-2021)

The CIHEAM Zaragoza Experience

Student testimonials



Neus Torrent

(Spain) 2013-2015 edition

Prize for the best Final Master Project of the University of Zaragoza.
Cofounder of Kaykun Care, SCCL (Spain)

“For me, participating in the Animal Nutrition Master of CIHEAM Zaragoza and UZ has meant a great step forward in my professional career. Totally recommendable for lovers of animal production”.



Sebastián Doti

(Uruguay) 2009-2011 edition

Livestock firm advisor (Uruguay)

“For a Latin American, this is an opportunity not only to receive training in a top-level academic environment but also to travel to other parts of the world, live new experiences and bring back what we have learnt to help produce more efficiently whilst optimizing resources and respecting the environment”.



Berta Llorens

(Spain) 2019-2021 edition

Currently in second year of the Master in AAFC (Canada)

“The Master in Animal Nutrition has enabled me to deepen my knowledge in animal biology and production, besides providing me with additional knowledge on feed types and qualities. Also, the fact that we learnt from top lecturers from each sector lead to high-level, up-to-date knowledge. This training experience has also given me the opportunity to continue my studies abroad”.



Refka Chebbi

(Tunisia) 2019-2021 edition

Currently in second year at CSIC-EEZ (Spain)

First year Erasmus + scholarship

“It has been a great satisfaction for me to be a student at CIHEAM Zaragoza. This Master has completed my technical training, providing me with the necessary knowledge and skills for my professional career. The study programme is modern and incorporates topical issues so we can keep up with the new trends in animal nutrition and welfare and food safety. I fully recommend it. Don't miss an opportunity like this one”.



Lecturers

More than 60 national and international experts



Juan Acedo-Rico

(Consultant, Madrid, Spain)

Manufacturing technology is of capital importance as it enables the feed mills to make up the formulations designed by the nutritionist and manufacture compound feeds to be used in different animal productions.



Phil Garnsworthy

(University of Nottingham, United Kingdom)

Because two thirds of agricultural land is used for growing grass, ruminants play a significant role in global food security. There is concern, however, about the environmental impact of ruminants due to enteric methane emissions and nitrogen excretion. It is important, therefore, to understand how nutrition influences rumen conditions so as to increase animal production efficiency whilst minimising environmental impacts.



Raúl Macchiavelli

(University of Puerto Rico, Mayagüez, Puerto Rico)

The correct application of Statistics in designing experiments and analyzing data is essential for conducting a quality research. This topic is a key component of the Master program in Animal Nutrition, and will prepare students in both conceptual and practical aspects of statistical methods.



Bruno Martin

(INRA, Rennes, France)

Dairy cow nutrition is of crucial importance for the farmer in order to limit production costs while preserving animal health and optimising the quantity and the quality of milk and dairy products produced using the local resources.

Ilias Kyriazakis

(University of Newcastle upon Tyne, United Kingdom)

The course includes several new developments in animal science; these are relevant to the continuous evolution of animal nutrition as a relevant discipline. Such developments include precision livestock farming, the environmental impact of livestock systems and the impact of nutrition on the health and welfare of livestock. I teach Immuno nutrition, which is a cutting edge topic as it brings together new knowledge of assessing animal health with the developments in the way we feed and manage livestock. This should enable students of the course to deal with the challenge of managing animals not only for their productivity but also their health and welfare.



Oriol Ribó

(EFSA, Parma, Italy)

The implementation of traceability systems in the supply chain permits immediate detection of any public health hazard and rapid application of the corresponding corrective measures.



Nacif Rihani

(FAO, Abu Dhabi, United Arab Emirates)

By-products and crop residues are valuable and affordable animal feed sources in the Mediterranean zone. They are often neglected or under-utilized. The corresponding chapter at the Master on Animal Nutrition covers their nutritional characteristics and highlights the opportunities for valorizing them in the context of livestock production systems in the region.



Bill Weiss

(Ohio State University, Wooster, USA)

Feed is the single greatest expense in producing milk and nutrition has a major impact on cow health and well-being. The topics covered in my section will provide students with the tools needed to understand the links between nutrition and cow health and how to formulate cost-effective and health-promoting diets for dairy cows.





International Networking

Lecturers participating in the 2019/2020 edition

ARGENTINA

J. DIRIENZO, UNC, Córdoba

CANADA

C. POMAR, Agriculture and Agri-Food, Lennoxville

FRANCE

J. AGABRIEL, INRAE, Clermont-Theix
R. BAUMONT, INRAE, Clermont-Theix
V. BERTHELOT, AgroParisTech, Paris
J.Y. DOURMAD, INRAE, Saint-Gilles
M.P. ELLIES, Bordeaux Sciences Agro
M. JOUVEN, SupAgro, Montpellier
D. MORGAVI, INRAE, Clermont-Ferrand
P. NOZIERE, INRAE, Clermont-Ferrand
J. VAN MILGEN, INRAE, Saint-Gilles

MOROCCO

N. RIHANI, Consultant

PUERTO RICO

R.E. MACCHIAVELLI, Univ. Puerto Rico, Mayagüez

SPAIN

J. ACEDO-RICO, Consultor, Madrid
R. ALASTRUE, Consultor, Zaragoza
R. AMEJEIRAS, Trouw Nutrition, Madrid
A. ARIÑO, Univ. Zaragoza
J. BALCELLS, Univ. Lleida
A. BARROETA, Univ. Autònoma Barcelona
S. BAYARRI, Univ. Zaragoza
G. CAJA, Univ. Autònoma Barcelona
S. CALSAMIGLIA, Univ. Autònoma Barcelona
M.M. CAMPO, Univ. Zaragoza



Participants and lecturers participating in the 2007/2019 period

● Number of students per country

● Number of lecturers per country

R. CARABAÑO, Univ. Politécnica Madrid
E. CARBONELL, Consultor, Valencia
J.J. CARRAMIÑANA, Univ. Zaragoza
I. CASASÚS, CITA-GA, Zaragoza
I. CASTELLANOS, Biología y Nutrición, Zaragoza
R. CEPERO, Univ. Zaragoza
A. DALMAU, IRTA, Monells
A. DAUDEN, CITA-GA, Zaragoza
P. DE FRUTOS, CSIC-ULE, León
J. DE LA OSADA, Univ. Zaragoza
A. DEL PRADO, BC3, Leioa
B. DE LA ROZA, SERIDA, Villaviciosa
A. DE VEGA, Univ. Zaragoza
I. DELGADO, CITA-GA, Zaragoza
M. FONDEVILA, Univ. Zaragoza
J. GARCÍA ALONSO, Univ. Politécnica Madrid
P. GARCÍA REBOLLAR, Univ. Politécnica Madrid
J. GASA, Univ. Autònoma Barcelona

G. GONZÁLEZ MATEOS, Univ. Politécnica Madrid
M. GORRACHATEGUI, Consultor, Madrid
C. LED, Oviaragón, Zaragoza
C. LÓPEZ-BOTE, Univ. Complutense Madrid
G. MARÍA, Univ. Zaragoza
S. MARTÍN-ORUÉ, Univ. Autònoma Barcelona
P. MEDEL, Innovabiotics S.L., Madrid
D. MENOYO, Univ. Politécnica Madrid
M.J. MILÁN, Univ. Autònoma Barcelona
J.L. OLLETA, Univ. Zaragoza
K. OSORO, SERIDA, Villaviciosa
R. OSTA, Univ. Zaragoza
J.F. PÉREZ HERNÁNDEZ, Univ. Autònoma Barcelona
G. RIPOLL, CITA-GA, Zaragoza
C. RODELLAR, Univ. Zaragoza
R. SALA, Univ. Autònoma Barcelona
M. SÁNCHEZ, Univ. Córdoba
G. SANTOMÁ, Trouw Nutrition, Barcelona

UNITED KINGDOM

P. GARNSWORTHY, Univ. Nottingham
I. KYRIAZAKIS, Univ. Newcastle
L. SINCLAIR, Univ. Harper Adams

UNITED STATES OF AMERICA

B. WEISS, Univ. Ohio, Wooster



Access, admission and scholarships



Dates and duration

Part One of the Master is held from 27 September 2021 to July 2022*.

Part Two will commence in September 2022 with a duration of 10 months.

(*) The end date of the first academic year stipulated for July 2022 may change according to the COVID-19 situation.

Selection process

The selection process is conducted by CIHEAM Zaragoza's studies commission for the Master, based on the documents submitted by candidates with their application and a personal interview. Academic results and any previous professional experience related with the area of specialization are the main aspects considered.



Admission and deadlines

Apply online at:

<http://www.admission.iamz.ciheam.org>

The application deadlines are the following:

Non-Spanish candidates:

18 March to 17 May 2021.

Spanish candidates or candidates with knowledge of Spanish *:

18 March to 6 September 2021.

* Non-European candidates should take note of the visa procedure deadlines.

Registration and scholarships

Registration fees are 2244* euro per academic year.

Candidates from CIHEAM member countries may apply for a scholarship to cover registration fees, medical insurance and full-board accommodation.

Candidates from other countries may apply for a grant to cover part of the registration fees.

(*) This fee corresponds to Decree 65/2020 of 30 July of the Government of Aragon and will be updated in accordance with the new official fees set by the Department of Science, Universities and Knowledge Society for the academic year 2021-2022.

Spain: Leading country in the agro-food sector

Spain is the 5th largest economy in the European Union and the 13th in the world in nominal terms. Spain is the 3rd most popular tourist destination in the world.



Spain is the **8th largest exporter of agro-food products** in the world.



Spain has the **largest surface area of vineyards** in the world.



Spain is the **largest producer of olive oil**.



Spain is the **2nd largest pork producer in the EU** and **4th largest** in the world.



60% of the **irrigated surface area** of Europe is in Spain.



Spain has the **largest organic farming area** in the EU.



Spain is **leader in aquaculture production** in the EU.



Spain is one of the **top commercial fresh fruit and vegetable operators**.



The **largest area of protected crops** in Europe is in **Almeria**.



Zaragoza, two thousand years of history in a Mediterranean country: **Spain**



-  Zaragoza
-  Madrid
-  Barcelona



The **gastronomy offer** is unlimited: Enjoy the famous tapas in **El Tubo** in Zaragoza or a tasty Thursday evening with the **Juepincho**.



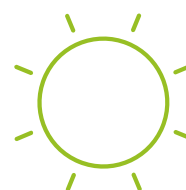
Practise your **sport of choice** in Zaragoza or take a weekend trip to the **Aragonese Pyrenees**.



A **dynamic city** with a wide cultural offer and a **rich and varied architecture** dating back 2000 years.



Soak up the **energy and good atmosphere** of the extravert Spanish personality and sense of humour.



Take advantage of the Mediterranean climate. **Spain** is the European country with the **most days of sunshine!**



A **strategic location** for travel to other parts of Spain and Europe.



Open, welcoming and cosmopolitan, Zaragoza also ranks high on the **Global City Talent Competitiveness Index**.

