Animal Breeding and Reproduction Biotechnology

International Master of Science (120 ECTS) ***2024/2026***

CIHEAM ZARAGOZA

UNIVERSITAT POLITÈCNICA DE VALÈNCIA

UAB Universitat Autònoma de Barcelona

Objective

Genetic improvement is one of the main factors contributing to sustainability and profitability in current livestock production systems. Modern animal breeding programmes rely on the combination of two different techniques to ensure genetic improvement. On one hand, population and quantitative genetics, based on applied statistical techniques, are the basis of current animal breeding programmes conducted by companies and breeders' associations. On the other hand, molecular genetics, based on biological and biochemical techniques, is becoming more prevalent in animal breeding programmes. Finally, reproduction biotechnology offers tools to enhance and facilitate the application of both quantitative and molecular breeding methods.

The Master programme provides sound training in these three essential subjects for animal breeding, leading students to acquire experience through critical revision of breedingand biotechnology programmes currently conducted in different species, and through practical work in related subjects.

The general objective of the Master is to train young professionals and enable them to establish, develop, evaluate and execute breeding programmes in companies of the livestock breeding sector, and conduct high-level research in breeding and biotechnology applied to livestock production at research centres.

The Master enables participants to:

- update the scientific grounds of the disciplines that constitute animal breeding;
- acquire experience in the application of the most advanced methods and techniques and in the formulation of breeding strategies related to the main species of zootechnical interest;
- gain the necessary expertise to join programmes dealing with molecular genetics, genetic improvement, reproduction biotechnology, and conservation of genetic resources, and provide alternatives that improve their effectiveness;
- respond to the specific demands of administrations or firms;
- engage in research, critically applying acquired knowledge, skills and abilities to solve real problems related to animal breeding;
- share enriching experiences and exchange points of view through a programme developed in close collaboration with the sector in an interprofessional and international environment.

Organisation

The Master is organised by the Polytechnic University of Valencia (UPV) and the Autonomous University of Barcelona (UAB) as an Interuniversity Official Master of the Spanish university system, and by CIHEAM Zaragoza (Mediterranean Agronomic Institute of Zaragoza) of the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), with the collaboration of the Valencian Institute for Agricultural Research (IVIA) and the National Institute for Agro-food Research and Technology (INIA-CSIC).

Why choose this Master?

1. International and multicultural experience. A unique opportunity to study and establish a network of contacts and collaboration with participants and experts from different countries. This international and multicultural experience is an essential differentiating factor in today's competitive job market.

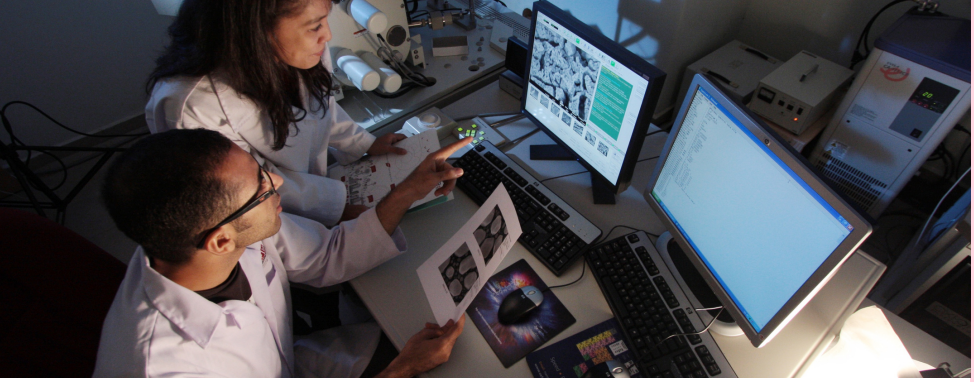
2. Lectures of recognised experience. Well qualified lecturers from international organisations, universities, research institutes and private companies from 7 different countries.

3. Interuniversity Master. Live in Barcelona and Valencia and learn at two top Spanish universities.

4. Official Spanish Master degree awarded by the UPV and Master of Science degree awarded by CIHEAM (equivalent to the official Master's degree of the Spanish university system). Postgraduate Specialisation Diploma awarded by CIHEAM upon completion of the first year.

5. High employability rate of alumni.

> ***The objective of this Master is to train young professionals and scientists so that they will have the operative capacity to establish, develop and evaluate animal breeding programmes***



Programme

1st year of the Master (60 ECTS)

The programme delivered in Part One (60 ECTS) has a professional focus and includes lectures, individual and group practical work.

Subject 1 – Molecular genetics (20 ECTS)

- Molecular bases of animal genetics
- Animal genomics
- Laboratory of molecular genetics
- Bioinformatics practicals

Subject 2 – Applied breeding (27.5 ECTS)

- Fundamentals of statistical genetics
- Quantitative genetics I
- Quantitative genetics II
- Quantitative genetics III
- Management and conservation of genetic resources
- Breeding programmes in livestock species

Subject 3 – Reproduction biotechnology (12.5 ECTS)

- Reproduction fundamentals and techniques
- Practical in reproduction techniques
- Reproduction biotechnologies per specie

2nd year of the Master (60 ECTS)

Part Two of the Master (60 ECTS) consists of a tutored initiation to research and a Master Thesis based on an original research work, submitted under the supervision of a thesis director. The research work will be conducted at the organising institutions or different collaborating entities for an approximate period of 10 months.

Subject 4 – Principles and techniques associated with research (30 ECTS)

- Initiation to scientific research
- Techniques and data analysis
- Scientific documentation

Subject 5 – Master thesis (30 ECTS)

The Master thesis will be an original research project carried out by the student on a subject proposedby the Master's Study Commission, supervised by a tutor (witha PhD degree), also approved by the Commission. Exceptionally, students may propose another director or laboratory with a solid international scientific reputation, subject to approval by the Commission.

In collaboration with:

ivia instituto valenciano de investigaciones agrarias

CSIC Consejo Superior de Investigaciones Científicas

INIA Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria

Contact:
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Academic coordinator
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More info:

www.masteranimalbreeding.com

Admission

Part One of the Master is designed for approximately 20 participants fulfilling the following requirements:

- Eligibility to pursue postgraduate studies in their country of origin or accrediting the equivalent of 240 ECTS in graduate studies.
- A degree in agronomy, veterinary science, biology, biotechnology, or related subjects.
- Knowledge of genetics and statistics. Previous professional experience in this field is valued.

Spanish and English are the working languages of the Master, Spanish being the main language of instruction. Applicants from non-Spanish-speaking countries should accredit knowledge of Spanish at B1 level or higher. Candidates from non-English-speaking countries should accredit knowledge of English at A2 level or higher.

Registration

Registration fees are approximately 2400* euro per academic year for EU students and 3500* euro per academic year for non-EU students.

(*) This fee is orientative and may be updated according to the official rates established each year by the Generalitat de Valencia through the Council Decree.

Candidates from non-EU countries can apply online at the following website: http://www.admission.iamz.ciheam.org
Spanish students and EU students with knowledge of Spanish can apply online at the following website: https://www.upv.es/entidades/SA/mastersoficiales/592623normalc.html

Dates and deadlines

The first year of the Master will be held from 7 October 2024 to 13 June 2025. The second year will begin in September 2025 and run for approximately 10 months.

Application deadlines* are as follows:

- Candidates from non-EU countries: 5 May 2024
- Candidates from Spain or from EU countries with knowledge of Spanish:
  Phase 1: 1 March to 3 May 2024
  Phase 2: 17 June to 28 June 2024
  Phase 3: 29 July to 2 August and 26 August to 6 September 2024

*Non-European candidates should be aware of visa application deadlines.

Scholarships

Candidates from CIHEAM member countries (Albania, Algeria, Egypt, France, Greece, Italy, Lebanon, Malta, Morocco, Portugal, Spain, Tunisia and Türkiye) may request a scholarship to cover registration fees and/or accommodation. They will be awarded according to academic merit. Priority will be given to applicants from low, medium and medium-high income CIHEAM member countries according to the World Bank. Requests for scholarships should be made during the application process.

According to the agreement between INIA-CSIC and CIHEAM Zaragoza, INIA-CSIC may finance partial participation. Candidates from Latin America may apply for a scholarship covering all or part of the registration fee and board and lodging expenses.

Candidates from other countries seeking finance should apply directly to other national or international institutions.

Degrees

- Postgraduate Specialisation Diploma awarded by CIHEAM Zaragoza (60 ECTS)
- Official Spanish Master degree awarded by the UPV and Master of Science Degree awarded by CIHEAM (120 ECTS).