



Animal Breeding and Reproduction Biotechnology

International Master of Science (120 ECTS)

2026/2028



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 breeding and 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.

Participation in 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). The programme counts on the collaboration of the National Institute for Agricultural and Food Research and Technology of the Spanish National Research Council (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

Part One

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

Part Two

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 proposed by the Master's Study Commission, supervised by a tutor (with a 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:



Contact:

Andrés Schlageter

Academic coordinator

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More info:



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 1660 euro per academic year for EU students and 3320 euro per academic year for non-EU students. Check all the information about academic fees at the following website:

<https://www.upv.es/entidades/SA/ciclos/528304normalc.html>

Candidates from non-EU countries requesting a scholarship can apply online at <https://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 October 2026 to June 2027. The second year will begin in September 2027 and run for approximately 10 months.

Application deadlines* are as follows:

- Candidates from non-EU countries applying for scholarship: **10 May 2026**
- Candidates from Spain or from EU countries with knowledge of Spanish:
 - Phase 1: 2 March to 30 April 2026
 - Phase 2: 15 June to 26 June 2026
 - Phase 3: 31 July to 7 August and 24 August to 4 September 2026

(*) 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), and from the priority Arab countries of the Spanish Cooperation Programme Masar Al'an (Algeria, Egypt, Jordan, Morocco, Mauritania, Palestine, Syria and Tunisia), may request scholarships awarded by **CIHEAM Zaragoza** covering registration fees, a monthly assignment, and medical and accident insurance. Candidates from countries that do not belong to CIHEAM may request a **'CIHEAM Zaragoza – INIA-CSIC'** scholarship covering registration fees, a monthly assignment, and medical and accident insurance. This scholarship may also include a contribution to travel expenses.

These two types of scholarships are administered by CIHEAM Zaragoza and will be awarded based on academic merit. Priority will be given to candidates from low and middle-income countries according to the World Bank classification.

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).



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