

Academic Year/course: 2021/22

## 28430 - Poultry and rabbit integrated Course

### Syllabus Information

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**Academic Year:** 2021/22

**Subject:** 28430 - Poultry and rabbit integrated Course

**Faculty / School:** 105 - Facultad de Veterinaria

**Degree:** 451 - Degree in Veterinary Science

**ECTS:** 8.0

**Year:** 4

**Semester:** Annual

**Subject Type:** Compulsory

**Module:**

## 1. General information

### 1.1. Aims of the course

The subject and its expected results respond to a single approach and objective: the ability of the graduate student to respond to the needs and requirements of the poultry and rabbit sectors. For this reason, it must demonstrate the learning results indicated below.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>), in such a way that the acquisition of the results of Learning the subject provides training and competence to contribute to some extent to its achievement:

- SDG 2. Zero hunger
- SDG 3. Good health and well-being
- SDG 8. Decent work and economic growth
- SDG 9. Industry, innovation and infrastructure.
- SDG 12. Responsible consumption and production.
- SDG 13. Climate action.

### 1.2. Context and importance of this course in the degree

As it is a 4th year subject, it is guaranteed that the students have a basic training on the characteristics of animals in general (Anatomy, Physiology, Ethnology, ...), so that they are already prepared to place these species in their meat and egg production aptitudes.

Spain is one of the most important European countries in the production and consumption of eggs, poultry and rabbit meat; the same happens with the Autonomous Community of Aragon at national context. Therefore, it is the student's interest to know the breeding methods and the health problems of these species with a view to their future professional possibilities.

In addition, the Biology and Ethnology of the rabbit with meat purpose are similar to those of the pet, laboratory or wild rabbit; something similar happens with the poultry used in the commercial production of meat and eggs in relation to the wild ones and with those bred for hunting, sports or simply for hobby purposes. Therefore, this subject can be useful for the training of future veterinarians in the breeding and health care of animals of these other skills.

### 1.3. Recommendations to take this course

Having passed most of the core subjects of the 1st, 2nd and 3rd courses, in particular Anatomy, Ethnology and Animal Welfare, Physiology, Nutrition, General and Quantitative Genetics, Microbiology, Epidemiology, Parasitology, Medical Pathology, General Pathology and Reproduction.

## 2. Learning goals

### 2.1. Competences

On successful completion of this course, students will be able to:

- Assess the state of health and welfare of birds and rabbits (general and specific signs of health and disease).
- Evaluate whether the feeding, handling and housing of birds and rabbits are adequate or not, and propose improvement programs, or corrective measures where appropriate.
- The same applies to hygienic and prophylactic measures applied at farm level.
- Avoid being a vector of diseases (personal hygiene and biosecurity measures).
- Master the necropsy technique, the interpretation of observations, and their integration with other data of diagnostic interest.
- Obtain in vivo (especially blood) and post-mortem as well as environmental samples of feed and products, decide on the most appropriate analyses, and send the samples to the laboratory under appropriate conditions.
- Interpret laboratory results.
- Decide and apply the appropriate therapeutics in each case, and apply the necessary vaccines by their various routes of administration.
- Perform euthanasia in birds and rabbits, individually and massively.

## 2.2. Learning goals

If students complete the course successfully, they should be able to

- Know and understand the egg, poultry and rabbit meat production systems, and their conditions and circumstances.
- Assess the health status and welfare conditions of animals, and establish critical judgement and proposals for improvement on their housing, feeding conditions, and reproductive and handling techniques.
- Recognize the most frequent pathological processes in these animal species of infectious, parasitic, metabolic origin, or related to the environment, food and reproductive and general management normally used; and assess and propose the preventive and therapeutic measures applied or applicable.
- Assess and establish a critical judgement and proposals to improve the productive and sanitary results of the animals.

## 2.3. Importance of learning goals

These animal species present a physiology very different from that of other animals, a short productive cycle, and a high technological level in their production conditions; all of them characteristics that imply a peculiar and usually novel husbandry dynamic for students.

The great interrelation that exists between the physiology of these animals and their possibilities and conditions of production stimulates the students to analyze when it is convenient to replace the concept of maximum by optimum, an important aspect also in daily life. They can also learn to evaluate how the adaptation of breeding techniques to the behaviour patterns of these species results in benefits for the animal, in a better organisation for the farmer, and in the improvement of the quality of life of both.

Other foreseeable results of learning this subject consist of becoming aware of the effects of different factors linked to husbandry methods on the quality and food safety of eggs, poultry meat and rabbit meat, products with high consumption in Spain; it is of great importance to consider the economic context of these productions - increasing costs and low prices, in a very competitive environment - so that the proposals and decisions of future professionals also contribute to the achievement of profitability and productive efficiency, an essential goal to achieve and maintain employment in companies in these sectors.

# 3. Assessment (1st and 2nd call)

## 3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

### Evaluation activities

The student must demonstrate that has achieved the intended learning outcomes through the following assessment activities:

- The knowledge and understanding of the theoretical and practical contents will be assessed with a written examination on the official dates, at the end of each school year.
- At the end of the first four-month period there will be a partial examination, free of matter, which will include rabbit contents; the second partial and the final examination, for students who have not passed the first, will be held at the end of the second four-month period.
- In all cases the theoretical examination will consist of brief descriptive questions, to be answered concisely.
- Practical skills will be assessed using a variety of methodologies:
- A written practical examination will be held on the official dates, on the same day as the theoretical examination.
- For contents related to practices in general, and to clinical and zootechnical cases, the practical examination shall be based on questions and problems to be solved. For contents related to clinical and anatomical-pathological diagnosis, a practical examination will be carried out based on photographs to be commented on.

- The resolution and public presentation of clinical cases of avian pathology prepared in teams by the students will be evaluated in 3 sessions held towards the end of each school year.
- The attitude and skills demonstrated in the practical sessions and the discussion of clinical and zootechnical cases will be evaluated by the teachers throughout the course.
- The ability to solve problems and handle information will be evaluated on an ongoing basis, proposing to all students specific questions that must be answered and presented in writing in a concise manner.
- Attendance at theoretical and practical sessions will be controlled and computable

### Valuation criteria and requirement levels

Written examination 70%

Continuous assessment 30%.

Ongoing evaluation includes:

Resolution of case studies in class 6%.

Exposition of practical cases carried out in team 16%.

Attendance controls and positive and participative attitude (practices) 8%

To pass the exam, it is required to obtain at least 50% of the possible points for the theoretical and practical contents as a whole, and not less than 40% of the possible points in each of the four sections of the program (Avian Production and Pathology, Rabbit Production and Pathology). It will consist of short-answer and / or multiple choice questions that will correspond to the theoretical and practical classes. Test questions may be multiple choice or true-false, in both cases a negative score associated with random chance will be applied in the event of an erroneous answer and which will be the result of the formula  $1 / n-1$  at most. There will be no question with a negative score.

In case of not passing the whole exam, the grades obtained in the past sections will be kept during the same academic year.

The subject is passed with a grade equal to or higher than 5 points out of 10.

### Marking system:

According to the national regulation Law 1025/2003, 5th of September which lays down the European system of credits and marking system for the university degree.

0-4,9: FAIL.

5,0-6,9: PASS

7,0-8,9: GOOD (NT).

9,0-10: EXCELLENT (SB).

As the article 158 of the Statutes of the University of Zaragoza lays down, provisional grades will be displayed at least for 7 days and students will be able to review them on the date, time and place provided for that purpose.

### Global test

Theoretical and practical knowledge will be assessed by means of a final exam that will cover all the contents taught in the subject.

Pupils who have not attended a minimum of 85% of the total number of face-to-face placements must prove that they have acquired the practical skills corresponding to the teaching not received by means of a specific examination. Therefore, this examination may include the demonstration of skills in the handling of animals and laboratory techniques, the ability to resolve clinical and zootechnical cases, and any other aspect developed in those face-to-face practices in which the students have not participated.

The evaluation criteria for these students will be: Theory, 70%, and practice, 30%.

The theoretical examination consists of four sections (Avian Production and Pathology, Rabbit Production and Pathology). To pass the exam, it is required to obtain at least 40% of the possible points in each of the four sections of the program and, at least, 50% of the possible points for the theoretical and practical contents as a whole. The exam will be adapted to the subjects taught in the corresponding academic year.

If you do not pass the whole of the exam, the marks obtained in each section passed will be kept during the same academic year.

For those students who present themselves in other examinations than the first, the evaluation, evaluation criteria and level of demand will be the same as in the first exam.

## 4. Methodology, learning tasks, syllabus and resources

### 4.1. Methodological overview

The learning process that has been designed for this subject is based on a combination of several methods:

- Teachers' theoretical lectures, supported by the publication of abstracts and supplementary material in the ADD to favor previous study and participation in class of students.
- Practices in farm and laboratory, to achieve mastery by the students of practical skills essential to acquire the corresponding professional competences.
- Discussion and resolution of clinical and zootechnical real cases, in order to increase their ability to analyze and

solve common problems in professional practice, including the search for relevant information. Some of them must be resolved and publicly exposed by the students themselves.

In general, the planned teaching methodology, especially the weight given to clinical and zootechnical cases, aims to promote the use of very diverse technical and scientific information, analysis and synthesis thereof, real problem-solving ability, and presentation of proposals and results, both individually and as a team.

## 4.2. Learning tasks

The theoretical classes in both species include contents of production and of animal health in a balanced way. Those related to rabbits will be given before those of poultry, and in both cases those related to animal production will precede those related to animal health.

Practical activities, which may begin before the end of the theoretical classes, include

1. farm management practices (7 h in poultry farming and 2.5 h in rabbit husbandry);
2. laboratory practices of embryodiagnosis and egg quality control (4 h);
3. clinical diagnostic practices (9 h in poultry and 2 h in rabbit);
4. reproduction technology practices (2 h in rabbit);
5. discussion of zootechnical and nutritional cases (4 h in poultry and 1 in rabbit);
6. discussion of clinical cases (2 h in poultry farming and 0.5 h in rabbit breeding);
7. presentation by students of clinical cases in avian pathology (2 h);
8. seminar on more frequent pathologies and prophylaxis in the current rabbit husbandry (2 h).

The theoretical and practical classes will be adapted to the corresponding Academic Calendar. There will be a total of 64 theoretical sessions and 41 hours of practice per student.

## 4.3. Syllabus

### CUNICULTURE THEORETICAL PROGRAM

#### Situation of the Rabbit Sector

Use of rabbits. Consumer perception. World production of rabbit meat. Evolution, trade and consumption in the main producing countries. Price evolution Evolution of farm management and organization. Results of technical and economic management. Specific factors involved in the cost of production.

#### Facilities

Basic conditions of the rabbit facilities, Organization and characteristics. Cage models. Other facilities and tools. Environmental physiology of rabbits: effect of lighting, temperature and ventilation on reproductive and food behaviors and on health. Environmental bio-stimuli Biosecurity: organization of the periodic health vacuum. Alternative systems

#### Reproduction, Reproductive Management and Productive Results

Goals. Anatomic-physiological memory of the female -cycle- and the male -puberty and choice of stallions-. Reproductive Rhythms Control of ovulation receptivity and induction through biostimulation and hormonal treatments. Semen collection and analysis: collection systems and rates, spermogram, dilution-conservation.

Artificial insemination. Birth. Pathological processes: pseudogestation, gestation toxemia, abortion, mastitis. Gazapos: Breastfeeding, weaning and bait. Lactation control: protection and biostimulation. Key factors for the optimization of farm results: prolificity, fertility, mortality, renewal rate, over-employment rate.

#### Feeding

Digestive physiology of rabbits. Peculiarities of the species, needs and limitations: breeders, males, peridestete and bait. Raw materials and their nutritional contribution. Additives and medicinal substances. Form of presentation, management and forecast. Transformation Rate

#### Genetic Improvement

Objectives and selection criteria in genetic improvement of the meat rabbit. Characters of interest and their genetic parameters. Selection and valuation of players in paternal and maternal lines of rabbit. Crossing. Genetic management in farm.

#### Infectious diseases

Myxomatosis. Hemorrhagic Viral Disease. Respiratory syndrome Digestive processes: Colibacillosis, Salmonellosis, Enterotoxemia, Tyzzer disease, Enteropathy. Other processes: Staphylococcia, Dermatophytosis -thin-

#### Parasitic diseases

Digestive processes: Coccidiosis, Cestodosis and Nematodosis. Respiratory processes: Pneumocystosis and Protostrongilidosis. Systemic parasitosis: Encephalitozoonosis, Hepatozoonosis and Larvarian Cestodosis. Cutaneous parasitosis: Scabies and other arthropodosis.

## Pathological anatomy

Gross pathological anatomy of the most frequent diseases of the rabbit.

### PRACTICAL PROGRAM

In farm:

Critical analysis of the facilities: orientation, external conditions, internal environmental variables -control of temperature, humidity, ventilation and lighting- Collection and disposal of dejections. Insects and rodents. Structure and organization of cages and animals; Water distribution and feed. Footrests

Observation of the healthy animal. Management male, female and rabbits. Organization of bands. The nest and the mother-filial relationship. Manipulation of adults and young people. Sexing

Replacement: alternatives and management. Selection farms and multiplication farms: production, management and administration of grandmothers, grandparents and breeders.

Evaluation of feed used in the farm by comparative study of commercial labels.

Farm sampling to assess the incidence of different pathological processes. Sick animal behavior. Collection of corpses and terminally ill animals destined for the practice of necropsies.

Insemination: Preparation of insemination material. Receiver handling. Ovulation induction. Insemination Technique  
Gestation Diagnosis: Abdominal palpation method

Biosecurity conditions: Clothing and footwear. Problems resulting from the mishandling of rabbits (infections, wounds: cleaning solutions, elimination of materials.

In necropsy room

Necropsy practice assessing macroscopic lesions. In the laboratory

Semen collection and dose preparation: Preparation of the artificial vagina. Temperature control. Restraint of the vagina. Collection technique: Management of the support-Behavior of the male. Seminal quality tests. Dilution rate

Diagnosis of digestive and cutaneous parasitosis of the rabbit. In classroom

Resolution of a case study previously made by students in non-face learning.

### POULTRY FARMING THEORETICAL PROGRAM

Economy of poultry production (2 h)

Structure and productive organization of the poultry meat production sector. Censuses, productions, marketing and consumption. Production costs. Recent trends and future perspectives.

Structure and productive organization of the egg production sector. Censuses, production ones, marketing and consumption. Production costs. Recent trends and future perspectives.

Avian genetics (2 h)

Base races of commercial hybrids. Qualitative characters of application in production. Quantitative characters: Heritability and correlations.

Methodology of genetic selection in poultry farming. Genetic progress achieved. Current problems derived from genetic selection. Choice of commercial hybrids.

Poultry Productions (2pm)

Breeding of laying and meat players. Food restriction: Fundamentals and control. Environmental needs Facilities and equipment.

Management of adult players. Food separated by sexes. Environmental needs Facilities and equipment. Prevention of laying on the ground.

Fertility and hatchability. Variation and control factors. Handling and hygiene of the hatching egg before entering machines.

Artificial incubation. Necessary environmental conditions. Types of incubators and hatchers. Process control Chick management.

Broiler breeding: Basic objectives. Phases of the bait. Facilities and equipment. Management and hygiene in farm. Necessary controls.

Broiler breeding: Environmental needs and their control. Insulation, Heating, Ventilation.

Broiler breeding: Heat stress, consequences and solutions. Refrigeration. Integrated climate control. Lighting programs. Population density: productive and health consequences, legal regulations.

Broiler breeding: Pre-slaughter handling. Channel quality and factors that affect it.

Breeding of future layers: Basic objectives. Phases of rearing. Facilities and equipment. Management and hygiene in farm.

Necessary controls. Peaking off: Basis, methodology, consequences, legal regulations.

Breeding of future layers: Effects of breeding conditions on subsequent production. Feeding management. Control of sexual maturity. Lighting programs.

Breeding of commercial laying hens. Basic Objectives Phases of the productive cycle. Facilities and equipment; legal regulations Management and hygiene in farm. Necessary controls.

Breeding of commercial laying hens. Egg formation process: practical applications in handling and nutrition. Egg quality and variation factors. Induced Moving Collection, classification and packaging of eggs.

Extensive systems in poultry farming. Floor laying hens, free-range laying hens and chickens. Productive and management differences. Facilities and equipment. Ecological poultry farming

Other avian species: Breeding of turkeys, ducks and quail. Hunting birds. Productions, basic management, facilities and equipment.

Avian Nutrition and Feeding (4 h)

Brief review of digestive physiology. Eating behavior.

Raw materials in poultry feed. Ingredients of choice, non-concentration and additives. Forms of feed presentation and particle size. nutritional needs (energy, PB / amino acids, ingestion) and factors that influence them

Player feed. Nutritional needs Food plan: Breeding, breeding and males.

Feeding of laying hens. Nutritional needs Feeding plan of pullets in breeding and rearing. Layers feeding plan by production phases. Effects of feeding on egg quality.

Fattening chicken feed. Nutritional needs Food plan according to growth phase. Effects of food on the quality of chicken meat.

Feeding in alternative poultry farming. Free-range chicken feed. Feeding of free-range hens and organic chickens. Turkeys.

Avian Reproduction (2 h)

Anatomo-physiological memory of the reproductive system in males and females. Reproductive Activity Hormonal regulation. Reproductive Behavior

Artificial insemination in species of productive interest. Reproductive pathology (prolapse, low fertility, etc.)

Medical Pathology (3 h)

Metabolic diseases: Ascites, sudden death syndrome, fatty liver syndrome. Leg problems: Valgus, varus, tibial dyschondroplasia, spondylolisthesis, etc.

Nutrition pathology

Infectious Diseases (11 h)

Avian Influenza Newcastle disease Infectious bronchitis (including variant strains)

Laryngotracheitis Difteroviruela

Pasteurellosis Coriza. Swollen head syndrome (TRT). Aspergillosis Mycoplasmosis Ornithosis-Psittacosis.

Marek's disease Avian Leukosis

Gumboro disease Proventriculitis Infectious anemia. Colibacillosis Salmonella infections.

Clostridiosis Necrotic enteritis

Syndrome of fall of putting. Viral hepatitis Avian encephalomyelitis. Reovirus

Parasitic Diseases (5 h):

Parasitosis of the digestive system: coccidiosis, histomonosis, Trichomonosis, ascaridiasis, heterakiosis, tricostrongilosis, cestodosis.

Parasitosis of the respiratory system: singamosis Cutaneous parasitosis: dermanisosis, scabies

PRACTICAL PROGRAM

In farm:

Evaluation of the biosafety conditions of the installation and management. Hygiene and disinfection.

Critical analysis of the facilities: orientation, external conditions, measurement and evaluation of internal environmental variables: temperature, humidity, ventilation and lighting.

Evolution of the environmental needs of broilers. Environmental control, programming. Evolution of bird management.

Signs of health and illness. Sanitary controls Mortality and causes (necropsies). Evaluation of animal welfare with animal-based measures: Pododermatitis and other skin lesions. Locomotive problems

Control and monitoring of technical results: Evolution of live weight and homogeneity, feed and water consumption, conversion rates.

Methods of sanitary sampling: Tights, swabs, blood collection, etc. In the farm.

Necropsy practice on field cases. Anatomic-pathological diagnosis. In the necropsy room.

Microbiological and serological diagnosis applied to field cases. Diagnosis of enteric and cutaneous parasitosis of birds.

Vaccination methods Evaluation of vaccination programs and serological results. In classroom.

Differential diagnosis of most frequent injuries in broilers, layers, breeders and other avian species of productive interest. In classroom.

Strategies for solving productive and management problems. Practical examples. Ingredients and formulation of rations for birds.

Strategies for the resolution of practical clinical cases.

Presentation and discussion of real clinical cases, previously made by students in non-face learning.

#### 4.4. Course planning and calendar

The key dates and milestones of the subject are described in detail, along with those of the rest of the subjects in the fourth year of the Veterinary Degree, on the website of the Faculty of Veterinary Medicine (link:

<http://veterinaria.unizar.es/gradoveterinaria/>). This link will be updated at the beginning of each academic year.

With respect to the calendar, the following tables reflect the approximate order of teaching of the different subjects:

##### CUNICULTURE

Activity	Lecture hours*	Practice hours	Group Size
Rabbit production	8,5		75
Practice session in rabbit farms A- facilities		1	12
Practice session in rabbit farms B- handling		1,5	6
Pathology Theory and Reproduction in rabbits	6,5		75
Practice session in reproduction A		1	6
Practice session in reproduction B		1	6
Parasitological diagnostic practice session		1	12
anatomy-pathological diagnosis practice session		1	36
Practice case session		1,5	6
Cuniculture workshop		2	75
TOTAL	15	10	

\*18 sessions of 50 minutes each

##### POULTRY

Activity	Lecture hours	Practice hours	Group Size
Poultry production	22		75
Poultry production practice cases		2	24
Poultry feeding practices		2	12
Embryodiagnosis practices		2	12

Egg quality control practices		2	12
Practice of biosafety assessment, housing		1.5	6
Broilers managing practice		6	6
Poultry Reproduction and Pathology Theory	21		75
Parasitological diagnostic practices		2	12
Practical medical pathology		1.5	6
Laboratory diagnostic practices		1	6
Serological diagnostic practices		2	6
Differential anatomo-pathological diagnosis Practice		2	36
Practical clinical cases		3	6
Clinical cases sessions		2	24
Presentation of clinical cases by students (group of 6)		2	48
TOTAL	43	31	

\*46 sessions of 50 minutes each

#### 4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?id=7512>