

# STUDYGUIDE

Species specific module:

## **Poultry / birds, including galliformes, passeriformes and columbiformes**

Introduction to Laboratory Animal Science



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**Universiteit Utrecht**

**Organisation:**

Department Animals in Science and Society (DWM)

Department of Farm Animal Health (FAH)

Department of Clinical Sciences of Companion Animals (CSCA)

Faculty of Veterinary Medicine, Utrecht University

**Coordinators:**

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## **Objective of the module**

The objective of this module is to present basic and appropriate biology, care, health and management of poultry / birds (galliformes, passeriformes and columbiformes), recognition of pain, suffering and distress in these animals and minimally invasive procedures without anaesthesia to be applied on these animals. This course meets the standards for the species-specific education and training requirements for persons designing projects and procedures for the previously mentioned species.

## **Competence**

For the function 'designing procedures and projects' the Dutch government requires competency.

On December 18, 2014 the new legislation regarding animal experimentation was implemented. Due to this implementation the course on Laboratory Science has been adapted. The course contains now two parts, a basic course (Introduction to laboratory animal science) and a species specific module. The basic course certificate and, at least, one species specific certificate will give the required competence.

From August 1, 2015 the competence is limited. You are not allowed to perform any procedure on animals, unless there is supplementary education. From now you are competent when you are skilled (competence profile, species and skill(s) stated).

After successful completion of the new basic course and after successful completion of the present module on rodents and rabbits, you will be competent to design procedures and projects and to execute simple procedures on these animals. Further skills have to be obtained by working under supervision until competence is demonstrated. Only then are you allowed to work with animals independently.

## **Workload**

The number of credits that can be obtained after successful completion of the course is 1.5 ECTS (European Credit Transfer and Accumulation System). The length of the course is one week (fulltime, 09.00-17.30 hrs). Participation in all parts of the course is mandatory to obtain a certificate.

## **Course material**

During the course the book Principles of Laboratory Animal Science, revised edition, 2001, L.F.M. van Zutphen, V. Baumans and F. Ohl (eds.) (ISBN 13: 978-0-444-50612-2) will be used. Further material will be provided digitally or by handouts.

## **Learning outcomes**

Learning outcomes are in accordance with the EC Training and Education Document relating to Directive EU/2010/63,

[http://ec.europa.eu/environment/chemicals/lab\\_animals/pdf/Endorsed\\_E-T.pdf](http://ec.europa.eu/environment/chemicals/lab_animals/pdf/Endorsed_E-T.pdf)

The species-specific course includes the following modules:

- 3.1 Basic and appropriate biology
4. Animal care, health and management (theory)
5. Recognition of pain, suffering and distress
7. Minimally invasive procedures without anaesthesia (theory)
8. Minimally invasive procedures without anaesthesia – species specific (skills).

For details, see separate chapters in the study guide.

## **Final examination**

In small groups you have to analyze a given article with help of a questionnaire that is based on the ARRIVE guidelines: (Kilkenny C, Browne WJ, Cuthill IC, Emerson M, Altman DG (2010) Improving bioscience research reporting: the ARRIVE guidelines for reporting animal research.). Based on every aspect you learned about during the course you have to describe in detail how the experiments described in the article are performed. You will report this in a small presentation (10-15 min) at the end of the course and discuss your choices with the critical audience- the other students.

Each student gets a mark ranging from 0-10 points (0= unsatisfactory, 10=very good) depending on the quality. The examination involves the handbook, the lectures, discussions, demonstrations and practical's.

## **Certificate**

If the participant has met all legal requirements and has successfully passed the exam at the end of the course, the participant will receive a certificate for this species specific module poultry / birds (galliformes, passeriformes and columbiformes).

If you do not meet all legal requirements, e.g. not having obtained a Master degree (yet), you will receive a written confirmation stating that you followed the module and successfully passed the exam. Together with the certificate for the basic course, after obtaining your Master degree, you can request the final certificate confirming that you meet all legal requirements of the Dutch legislation to be registered for the function “designing projects and procedures for poultry / birds (galliformes, passeriformes and columbiformes)”.

## Program outline\*

Day / location TBA	Time	Subject	Type	Teachers / group
<b>Monday</b>	09.00-09.45	Introduction: Overview topics, practical matters and study materials	Lecture	Course coordinator
	10.15-11.30	Experimental bird behavior in relation to animal welfare	Lecture	A: RN (E&C)
	11.45-12.00	Introduction assignment working group day 4	Introductio	A&B: RN (E&C)
	12.00-13.30	Preparation practicals day 2 and lunch	Study time	No teacher
	13.30-14.30	Basic principles of bird anatomy and physiology	Lecture	A&E: CW (PB)
	15.00-16.00	Physiology of Stress and Reproduction	Lecture	C: VGJ (DWM)
	16.15-16.45	Specific biology, husbandry and handling of quail	Lecture	C: VGJ (DWM)
	16.45-17.00	Introduction exam assignment / presentation	Introductio	A/C/E: VGJ (DWM)
<b>Tuesday</b>	09.00-10.15	Handling & Behavior & Basics of clinical examination of chickens	Practical	A: JvS, MD (FAH)
	10.30-11.45	Basic procedures: sampling, inoculations and treatments chicken	Practical	A: MD
	12:30-14.00	Feed: feed physiology, dietary requirements and general considerations	Lecture	C: EHP or TS
	14.15-15.45	Husbandry: Housing, climate control and other requirements experimental chickens (and some practical aspects of incubation, hatching and chick management)	Interactive lecture	A: FW, MK (FAH)
	16.00-17.00	Preparation practicals day 3	Study time	No teacher
<b>Wednesday</b>	09.00-10.30	Preparation working group day 4 (incl. videos of experimental animals)	Study time + Lunch	No teacher
	10.30-12.00	Lecture / demo of humane killing + post-mortem examination	Demo & Practical	A: FV (FAH)
	13.00-14.00	Anesthesia and analgesia in birds	Lecture	E: YvZ (CSCA)
	14.15-17.30	Biology, husbandry and handling of other birds than quail and chickens, followed by demo + practical on Basic procedures: handling, blood sampling and pharyngeal swab pigeon and tour of bird facilities at CSCA.	Lecture, Demo + Practical	E: YvZ (CSCA)
<b>Thursday</b>	09.00-10.30	Preparation presentation (=exam assignment)	Study time	No teacher
	10.30-12.15	Diseases and monitoring	Lecture	A&E: HV (PB)
	13.15-14.30	Preventing avoidable discomfort in laboratory animals: assessment of pain, suffering and stress or discomfort, welfare/discomfort and practical application of humane endpoints	Working group	A&B: RN, FV (FAH)
	14.30-17.30	Preparation presentation	Study time	No teacher
<b>Friday</b>	09.00-12.15	Preparation presentation or room for additional individual program	Study time	No teacher
	13.00-15.00	Presentation article	Exam	FAH, DWM, CSCA and/or E&C
	15.15-15.45	Course evaluation	Evaluation	FAH, DWM, CSCA and/or E&C

\* The schedule as mentioned above is intended to provide an overview of the course contents. Exact times and locations for the individual lectures, practicals and working groups may vary from course to course, dependent on the availability of the teachers and will be made available prior to the start of each course

## Coordination and teachers

### Course (sub) coordinators

The module has been developed by representatives of three different departments with specialized expertise for the different topics in this module:

- Department Animals in Science and Society (DWM): Vivian Goerlich-Jansson
- Department of Farm Animal Health (FAH): Francisca Velkers
- Department of Clinical Sciences of Companion Animals (CSCA): Yvonne van Zeeland

For each course one of these coordinators will be appointed as logistic coordinator and contact person for practical issues.

In addition, different sub-coordinators with specialized expertise have been made responsible for parts of the program. All (sub)coordinators and their main topic(s) are listed below. The letters in the program in the column 'Teachers / group' correspond with the persons below that are responsible for that part of the module.

A: Francisca Velkers (FV): Department of Farm Animal Health, Epidemiology of Infectious Diseases and Health Care Group: poultry  
<http://www.uu.nl/staff/FCVelkers>

B: Rebecca Nordquist (RN): Department of Farm Animal Health, Emotion and Cognition (E&C) Group: behaviour and welfare  
<http://www.uu.nl/staff/renordquist/0>

C: Vivian Goerlich-Jansson (VGJ): Department Animals in Science and Society (DWM), Division Animal Welfare & Laboratory Animal Science: stress en reproduction physiology, quail, exam assignment  
<http://www.uu.nl/staff/VCGoerlichJansson>

D: Esther Hagen-Plantinga (EHP), Department of Farm Animal Health, Animal Nutrition Group: feed  
<http://www.uu.nl/staff/EAHagenPlantinga>

E: Yvonne van Zeeland (YvZ), Department of Clinical Sciences of Companion Animals (CSCA), Division of Zoologic Medicine (Vogels en Bijzondere dieren (VBD)): columbiformes and passeriformes, anaesthesia and analgesia  
<http://www.uu.nl/staff/YRAvanZeeland>

**Other teachers:**

*Department of Farm Animal Health - Epidemiology of Infectious Diseases and Health Care Group:*

Marius Dwars (MD): <http://www.uu.nl/staff/RMDwars>

Ing. Jan van Schip (JvS): <http://www.uu.nl/staff/JWMvanSchip>

Freek Weites (FW): <http://www.uu.nl/staff/FWeites>

Marc Kranenburg (MK): <http://www.uu.nl/staff/MKranenburg>

*Department of Farm Animal Health - Animal Nutrition Group:*

Thomas Schonewille (TS): <http://www.uu.nl/medewerkers/JTSchonewille/0>

*Department of Pathobiology (PB):*

Hélène Verheije (HV): <http://www.uu.nl/staff/MHVerheije>

*Department of Pathobiology - Anatomy and Physiology:*

Claudia Wolschrijn (CW): <http://www.uu.nl/staff/CFWolschrijn/0>

## **Module 3.1 Basic and appropriate biology**

This module provides an introduction to the basic principles of animal behaviour, care, biology and husbandry. It incorporates information in relation to anatomy and physiological features, including reproduction, behaviour and routine animal husbandry and enrichment practices. It is not intended to provide more than the minimum background information which is needed for someone to be able to begin work under supervision.

Following this module practical training, under supervision, should provide each individual with the expertise and skills needed for them to carry out their particular function. Practical training requirements will, inevitably, differ according to function.

### **Learning Outcomes**

Trainees should be able to:

3.1.1. Describe basic anatomy, physiology, reproduction and behaviour of the relevant avian species.

3.1.2. Recognize and describe life events that have the potential to cause suffering including sourcing, transport, housing, husbandry, handling and procedures (on a basic level).

3.1.3. Indicate how good welfare can promote good science: e.g. explain how the failure to attend to biological and behavioural needs may affect the outcome of procedures.

3.1.4. Indicate how husbandry and care may influence experimental outcome and the number of animals needed e.g. example where the place in the room influences the outcome, hence randomisation.

3.1.5. Describe the dietary requirements of the relevant animal species and explain how these can be met.

3.1.6. Describe the importance of providing an enriched environment (appropriate to both the species and the science) including social housing and opportunities for exercise, resting and sleeping.

3.1.7. When relevant to the species, recognise that there are different strains, and that these can have different characteristics which can affect both welfare and science.

3.1.8. When relevant to the species, recognise that alterations to the genome can affect the phenotype in unexpected and subtle ways, and the importance of monitoring such animals very carefully.

3.1.9. Maintain and interpret accurate, comprehensive records of animals held in the animal facility, including the wellbeing of the animals

3.2.1. Be able to approach, handle/pick up and restrain an animal and return it to its cage/pen in calm, confident and empathetic manner such that the animal is not distressed or caused harm.

## **Module 4. Animal care, health and management (theory)**

This module provides information on various aspects of animal health, care and management including, environmental controls, husbandry practices, diet, health status and disease. It also includes relevant basic learning outcomes relating to personal health and zoonoses.

### **Learning Outcomes**

Trainees should be able to:

- 4.1. Describe suitable routines and husbandry practices for the maintenance, care and welfare for a range of avian species used in research.
- 4.2. Describe suitable environmental and housing conditions for birds kept as laboratory animals, how conditions are monitored and identify the consequences for the animal resulting from inappropriate environmental conditions.
- 4.3. Recognise that changes to or disruption of circadian or photoperiod can effect avian species.
- 4.4. Describe the biological consequences of acclimatisation, habituation and training
- 4.5. Describe how the animal facility is organized to maintain an appropriate health status for the relevant bird species and the scientific procedures.
- 4.6. Describe how to provide water and an appropriate diet for birds kept as laboratory animals including the sourcing, storage and presentation of suitable foodstuffs and water
- 4.7. List the methods, and demonstrate an understanding of appropriate, safe and humane handling, sexing and restraint of one or more named avian species for common scientific procedures.
- 4.8. Name different methods for marking individual animals and state an advantages and disadvantage for each method.
- 4.9. List potential disease risks in the animal facility, including specific predisposing factors which may be relevant. Name methods available for maintaining appropriate health status (including use of barriers, different containment levels use of sentinels as relevant to the species).
- 4.10. Describe appropriate breeding programmes
- 4.11. Describe how genetically altered animals can be used for scientific research and the importance of monitoring such animals very carefully.
- 4.12. List the correct procedures for ensuring health, welfare and care of birds during their transport.

## **Module 5: Recognition of pain, suffering and distress**

This module prepares individuals to be able to identify normal condition and behaviour of experimental animals and enable them to differentiate between a normal animal and one which is showing signs of pain, suffering or distress which could be a result of factors including environment, husbandry or the effect of experimental protocols. It will also provide information regarding severity classifications, cumulative severity and the use of humane endpoints.

### **Learning Outcomes**

Trainees should be able to:

- 5.1. Recognise normal or desirable behaviour and appearance of the individuals in the context of species, environment and physiological status.
- 5.2. Recognise abnormal behaviour and signs of discomfort, pain, suffering, or distress, as well as signs of positive well-being and principles of how pain, suffering and distress can be managed.
- 5.3. Discuss factors to be considered and methods available for assessing and recording the welfare of animals e.g. score sheets.
- 5.4. Describe what a humane end point is. Identify criteria to be used to set humane endpoints. Define action to be taken when a humane endpoint is reached and consider possible options for refining methods to finish at an earlier endpoint.
- 5.5. Describe the severity classifications included in the Directive and give examples of each category; explain cumulative severity and the effect this may have on the severity classification.
- 5.6. Describe the circumstances when anaesthesia or analgesia may be necessary to minimise pain, suffering, distress or lasting harm

## **Module 7: Minimally invasive procedures without anaesthesia (theory)**

### **[Function Specific for Functions A and B]**

This module provides an introduction to the theory relating to minor procedures. It provides information about appropriate methods of handling and restraint and describes appropriate techniques for injection, dosing and sampling relevant to the species. It should provide information sufficient for individuals to understand what will be required of them before they go on to trained in the practical aspects of these skills whilst under supervision.

### **Learning Outcomes**

Trainees should be able to:

- 7.1. Describe appropriate methods and principles to be followed when handling birds (including methods of manual restraint and use of restricted environments).
- 7.2. Describe the biological impact of procedures and restraint on physiology.
- 7.3. Describe refinement opportunities for procedures and restraint e.g. through training (using positive re-enforcement), habituation and socialisation of birds.
- 7.4. Describe techniques/procedures including, for example, injection, sampling and dosing techniques (routes/volumes/frequency), dietary modification, gavage, tissue biopsy, behavioural tests, use of metabolic cages.
- 7.5. Describe how to perform minor techniques and relate appropriate sample volumes and sampling frequencies for the relevant avian species.
- 7.6. Describe the need for rigour and consistency in conducting scientific procedures and the correct recording and handling of samples.
- 7.7. Describe appropriate methods for the assessment of the welfare of birds with respect to the severity of procedures and know what appropriate action to take.
- 7.8. Recognize that refinement is an on-going process and know where to find relevant, up-to-date, information.
- 7.9. Describe the biological consequences of transport, acclimatization, husbandry conditions and experimental procedures on the species concerned and describe how these can be minimised.

## **Module 8: Minimally invasive procedures without anaesthesia – species specific (skills)**

### **[Function Specific for Function A]**

This module delivers practical elements of training relevant to Module 7. Practical training for minor procedures can be taught through a number of methods using different tools which are available and designed for the purpose (this is likely to include synthetic animal models and the use of cadavers). The module should be designed in such a way that it will enable the trainee to attain a level of proficiency such that, when commencing work under supervision, s/he should cause no pain, suffering, distress or lasting harm to the animal.

### **Learning Outcomes**

Trainees should be able to:

- 8.1. Select and explain the best methods for common procedures (such as blood sampling and application of substances) including route/volume/frequency as appropriate.
- 8.2. Demonstrate that s/he can handle and restrain the animal in the best position for the technique.
- 8.3. Perform minor techniques under supervision, in a manner that does not inflict unnecessary pain, suffering, distress or lasting harm.