LAS-Learning

Trainees Instructions

EU Module 3.1 - Basic and appropriate biology - Species specific: Pigs

Development of interactive e-learning modules on specific areas of the Education & Training framework facilitating implementation of DIR 2010/63/EU

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Suported by:

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1. Module Description

1.1 Overview

This module - Basic and appropriate biology - Species specific: Farm animals - will introduce you to the basic biology of the most common farm animals used in research: pigs, fowls, and ruminants. It will cover their anatomy and physiology, dietary needs, optimal housing in a laboratory environment, and methods to ensure good health and welfare through best husbandry practices for each species. Additionally, the module will address the impact of various experimental procedures on their welfare, discuss the different strains used in laboratories, and outline best practices for record-keeping.

If you are visiting the site independently, you should consult the EC Training and Education framework guidance document, which provides an overview of training requirements for individuals with different responsibilities under their relevant national legislation. Additional education and training may be necessary to meet national or institutional requirements.

This document offers suggestions for supporting your training. Each module aligns with the learning outcomes specified by the EU Education & Training framework for laboratory animal science. This module was developed by José Manuel Sánchez Morgado, a professional known for his contributions to animal welfare, veterinary science, and related fields with extensive experience researching, publishing, and training. In addition, an international Reflection Group panel has further refined the content, while Nuno H. Franco managed overall coordination.

Your collaboration and feedback are greatly appreciated, as the module is currently in the testing phase.

2. Prerequisites and Requirements

No specific prior knowledge is required. However, a basic understanding of searching bibliographic databases and a background in laboratory animal science and/or non-animal methods can be advantageous.

This module is designed to guide you step by step, eliminating the need for prior study.

2.1 Requirements

- Completion of lessons and understanding of learning objectives.
- Participation in knowledge checks and assessments to evaluate understanding.

3. Grading and Completion

Grading will be based on the successful completion of knowledge checks and assessments provided at the end of each module. Upon finishing all parts of the module, students will receive a certificate of completion.

4. Textbooks and Reading Materials

The **"References and Further Reading"** lesson provides most references and readings. They comprise scientific articles, sections of books, websites, and videos. Clicking on any link will open a new window to download or visualise the additional material. Several links to further resources can also be found in the module contents to better guide the reader.

The additional materials provide more information on specific topics, tools, and resources.

5. Course Program

The module is organised into one chapter, with lessons and learning objectives as follows:

Chapter	Lessons	Learning objectives
Pigs	1-11	• Develop an interactive educational resource representing the musculoskeletal, circulatory, gastrointestinal, respiratory, and urogenital systems through a combination of interactive labeled figures, flip-cards with images, and descriptive lists. • Provide an educational resource describing diet and water needs through a combination of images and lists. • Provide husbandry recommendations for research animals in a collapsible format. • Describe different husbandry practices and outline human socialisation in a three-step process. • Present breed descriptions through 20 photos. • Describe records for pigs in research settings through text and organised lists of general and additional records.

Table 1 - Learning objectives per parts and lessons.

5.1 Progress Tracking

Once you begin working through a module, your progress is tracked, and you can break off and resume your studies at any point. Once the module is completed, the trainee can access any section to refresh their understanding of a topic.

5.2 Module Structure

The module is divided into several parts, and although they were designed to be followed sequentially, they can also be taken iteratively. Please note that a certificate of completion is only issued to learners who complete all module parts.

5.3 In-Depth Explanation Lesson by Lesson

Lesson	Title	LO	Explanation
1	Introduction		Introduction to pigs with 5 photos.
2	Anatomy and Physiology	3.1.1	Musculoskeletal represented with 2 interactive labelled figures, 1 slack of 3 flip-cards with 3 photos and 1 labelled figure. Circulatory System represented with 1 slack of 5 flip-cards with 5 figures, 1 list, and 1 interactive labelled figure. Gastrointestinal tract represented with 3 interactive labelled figures.

			Respiratory system description with 1 figure. Urogenital system represented in 1 interactive labelled figure.
3	Dietary requirements	3.1.2	Description of diet with 1 photo and 1 list. Description of water needs.
4	Housing	3.1.3	Recommendations for the husbandry of research animals in a collapsible.
5	Husbandry and Welfare	3.1.4 3.1.5 3.1.6	Commission recommendations for pigs and minipigs in 4 tables.
6	Welfare impact of procedures	3.1.7	Different husbandry practices description. Human socialisation in a 3-step process.
7	Different strains	3.1.8	Breeds description represented with 20 photos.
8	Records	3.1.9	Records for pigs in the research setting description in text. General records in 1 list. Additional records in 1 list.
9	Summary		Module summary
10	References and Further Reading		References for additional materials
11	Knowledge-check		Assesses progress and knowledge acquired during the module

Table 2 - Explanation lesson by lesson.

6. Target Audience

This module is intended for (bio)medical researchers, participants in laboratory animal science courses, university students, biology/medical teachers, animal welfare body members, regulators, and anyone interested in learning more about animal research ethics and the principles of Replacement, Reduction, and Refinement of animal use for scientific and educational purposes.