



Veterinary Continuous Education in Europe
International non-profit association

Competences for
the VETCEE accredited programmes in Laboratory Animal
Science and Medicine

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Approved by
The VETCEE Board

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Competences for the VETCEE accredited Laboratory Animal Science and Medicine programmes

'Dossier of competences and module descriptors for VETCEE accredited Laboratory Animal Science and Medicine drafted by the Laboratory Animal Science and Medicine sub-committee of the VETCEE'

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Introduction

European Directive 2010/63/EU (replacing the Directive 86/609/EEC) has introduced new requirements for the protection of laboratory animals / animals used for scientific purposes across the European Union. In particular, it requires that establishments that breed, supply or use laboratory / animals have a designated veterinarian (DV) with expertise in laboratory animal medicine, or a suitably qualified expert where more appropriate, charged with advisory duties in relation to the well-being and treatment of the animals (ESLAV/ECLAM/LAVA/EVERI recommendations, 2015). Laboratory animal veterinarians are key persons to ensure health and welfare of animals and therefore to contribute to the advancement of medical and scientific knowledge.

The aim of this document is to provide a dossier of competences in the field of Laboratory Animal Science and Medicine, that can be used by national postgraduate programmes to certify the level of knowledge, skills and competences (KSC). Definition of minimum standards that should be met will allow the VetCEE accreditation of those programmes and facilitate mutual recognition of professional qualification across EU Member States (MS). VetCEE is a joint initiative of EAEVE, EBVS, FVE and UEVP aimed to develop a standard for structured continuing professional development (CPD) in collaboration with European Veterinarian associations.

Laboratory animal science and medicine (LASM) is a broad veterinary discipline covering several areas of concerns and various species from mouse to non-human primates, including also aquatics and farm animals (Turner P et al, 2009). Due to the variety of establishment, it is acknowledged the roles and therefore the knowledge and skills of the veterinarians should be tailored to the needs, complexity and purpose of the establishment (ESLAV/ECLAM/LAVA/EVERI recommendations, 2015).

Post-graduate programmes are already in place in various European countries, such as those approved by ECLAM. Accreditation by VetCEE of components of these programmes will allow for wider mutual recognition. In case of accreditation of national programmes or courses delivered by European bodies it is also expected that ECTS-credits (European Credit Transfer and Accumulation System Credits) can be transferred into other programmes (e.g. an accredited course in anaesthesiology worth 5 ECTS and delivered by University in Spain would be accepted as sufficient training in anaesthesiology worth 5 ECTS by any national body awarding a postgraduate certificate in LASM [or equivalent] in a country other than Spain).

References

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Turner PV, Colby LA, Gaertner DJ, Vandewoude S, Vasbinder MA, Perspectives on Curriculum Needs in Laboratory-Animal Medicine, J Vet Med Educ. 2009 Spring;36(1):89-99

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Directive 2010/63/EU of the European Parliament and of the Council of 22 Sept 2010 on the protection of animals used for scientific purposes.

Education in the programmes

A modular training structure with a focus on learning outcomes is considered the more appropriate in order to keep the CPD programmes flexible, available and accessible and affordable to practitioners.

Each module should be specified at a certain amount of European Credit Transfer and Accumulation System Credits (ECTS) and the whole programme should cover 30 ECTS (approximately 750 hours of didactic and blended learning, including contact hours, thesis/article writing, participation to research, presentation of case reports, study time, etc.).

The programme providers are encouraged to use a variety of teaching methods in order to address the different learning styles. It is expected that classical lectures are accompanied by / accomplished with self-direct learning sessions, practical sessions, tutorials, case studies, workshops, written assignments, e-learning etc.

According to the “Standards & Dossier of Competencies” of the VETCEE committee, all courses/modules shall be headed (at least jointly organised) by institution accredited by the national accreditation systems (or EAEVE accredited in case national accreditation system for Training providers is not established) and shall have a quality assurance programme. The qualification level of the programme should correspond to EQF Level 7 that recognise highly developed and complex levels of knowledge which enable the development of in-depth and original responses to complicated and unpredictable problems and situations.

Objectives

As noted VetCEE is a joint initiative of EAEVE, EBVS, FVE and UEVP aimed to develop a standard for structured continuing professional development (CPD) in collaboration with European Veterinarian associations. DVs working under European Directive 2010/63/EU are responsible for their own continuing development relevant to their work in order to maintain and develop their competencies. According to the “Working document on the development of a common education and training framework to fulfil the requirements under the Directive: Brussels, 19-20 February 2014”, the objectives of post graduate training programmes should be: “to cover the basic principles of (rather than species-specific) components of a programme of veterinary care specifically in relation to the care and use of animals for research”, which are:

- Movement of animals and its implications
- Animal care, health and management
- Assessment of well-being
- Recognition and alleviation of pain, suffering and distress
- Relevance of the choice of animal models
- Design of procedures and projects
- Implementation of the Three Rs
- Use of medicines
- Surgical and non-surgical interventions
- Anaesthesia and analgesia
- Euthanasia
- Occupational health and safety (zoonosis, allergies, etc.)

In particular, specific training modules should include Legislation, Ethics, and development of communication skills in the field of Animal care and use. Species specific specialisation (e.g. non-human primates, avian, fish, cephalopods) can be achieved with dedicated modules in line with the format and standard detail above in the section on “Education in the programmes”.

The species covered in the training are not prescribed but should include the most common animal species used in research in Europe as reported and published by the European Commission and include at least one rodent and one non-rodent species.

The modular structure of the programme, the specific content of each module and the effort in terms of ECTS is summarised in the Table of Modules.

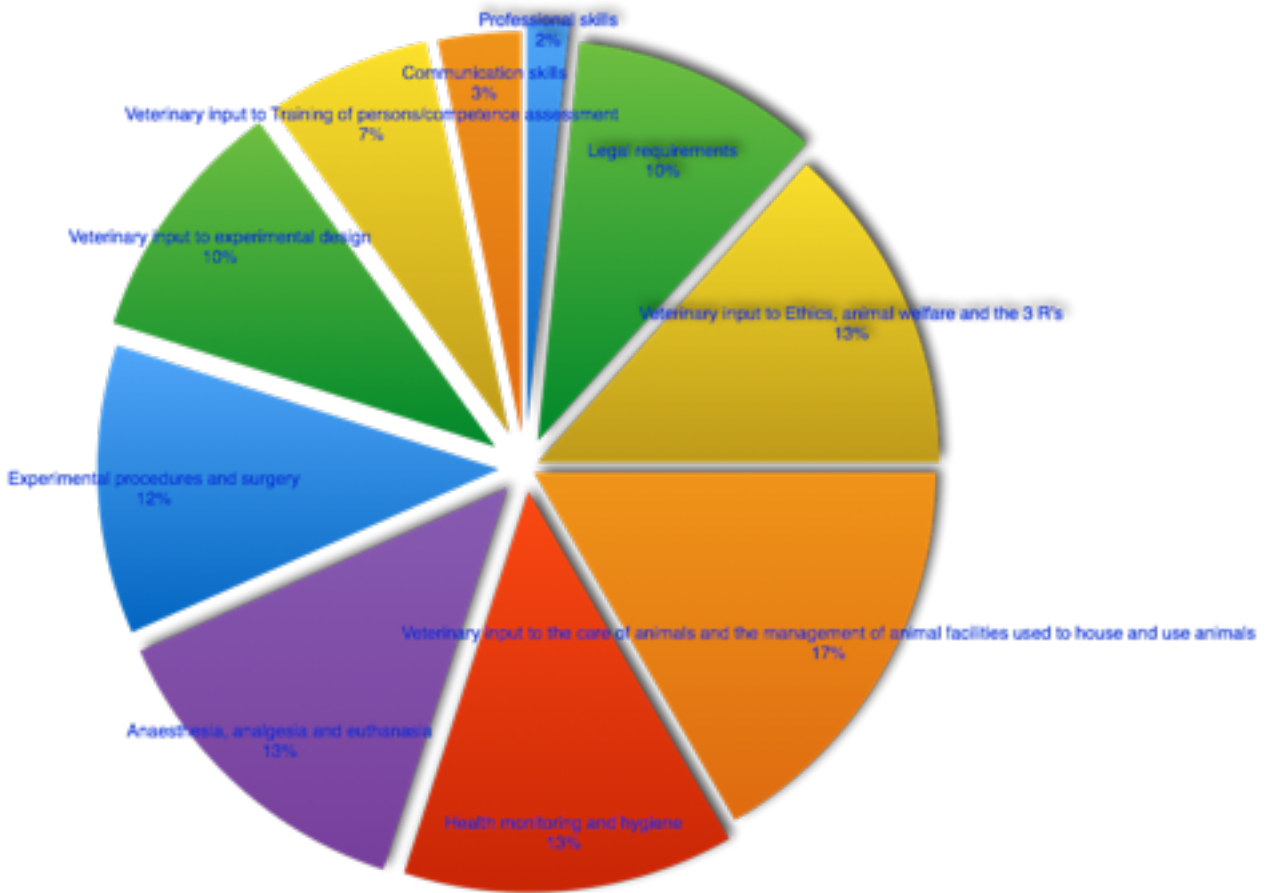
Table of Modules

Module	approximate equivalent Hours	Specific contents
Professional skills	12.5	Use of common professional skills in an appropriate manner for an animal research environment.
Communication skills	25	With animal caretaker staff, technicians, researchers etc.
Legal requirements	75	Directive 2010/63/EU on the protection of animals used for scientific purposes, and its associated formal EU documentation and guidance.
Veterinary input to Ethics, animal welfare and the 3 R's	100	Bioethics Ethical committees, ethical review of projects 5 freedoms Appropriate housing, social interactions Stress recognition/assessment Cost/benefit Recognition and alleviation of pain and distress Humane endpoints Alternatives Reuse of animals Promotion of a culture of care
Veterinary input to the care of animals and the management of animal facilities used to house and use animals	125	Biology and husbandry Breeding :reproductive physiology, production of Genetics and nomenclature GAA, genotyping, phenotyping Animal Identification Housing and Climate Enrichment Record keeping Nutrition and influence on research Materials (hygiene, disinfection/sanitation, biocontainment) Storage, waste disposal Transport Quality accreditation systems: AAALAC, ISO, GLP

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Animal health and related topics	100	Preventative veterinary medicine including disease prevention, detection and surveillance Issues associated with GAA e.g. immunocompetence Microbiology Pathology of spontaneous, infectious and parasitic diseases Veterinary Treatment and resolution Sanitary status, gnotobiology Biosecurity: zoonoses, allergies etc.
Anaesthesia, analgesia and euthanasia	100	Principles, equipment (for small animals), techniques Pharmacology: choice of anaesthetic agent in relation to animal species and nature of experiment Pain management: recognition, assessment and relief of pain; choice of appropriate analgesic in relation to the animal species and nature of experiment-adverse effects of pain and analgesic drugs on scientific outcome-selection of appropriate analgesic regimens for particular research protocols Peri-operative monitoring and care Humane killing methods
Experimental procedures and surgery	87.5	Handling and restraint Sampling techniques: collection of blood/urine/faeces etc. Administration routes: injection, oral dosing, Principles of surgery, surgical equipment, aseptic techniques Special surgical procedures, microsurgery Telemetry Alterations to food and water
Veterinary input to experimental design	75	Literature search Choice of the experimental animal (species, strain etc.) Limitations of animal experimentation-extrapolation of animal data to men Biostatistics-experimental design-analysis and interpretation of results protocol and retrospective review
Veterinary input to Training of persons/competence assessment	50	Appropriate Teaching/Training skills Good communication skills Good interpersonal skills Record keeping (basic training, CPD...)
		TOTAL (MUST NOT EXCEED 30 ECTS CREDITS)

Overall balance of Modules



General Competencies

Professional skills

Background

Veterinarians working in the field of Laboratory Animal Science and Medicine should exercise the common professional skills in an appropriate manner for an animal research environment. Many of the skills will be gained in education or previous roles, but they should be reviewed and maintained for use in this field.

The module should include following topics:

- Professional interactions with internal and external stakeholders and as a member of a multi-disciplinary team
Appropriate use of informed consent and confidentiality
- Understanding of the governance and accountabilities relevant to place(s) of work
- Accurate record-keeping, appropriate to the context
- Application of good clinical judgement according to the specific ethical and social context
- Ensure professional responsibility are met with the prescribing, labelling and use of veterinary medicines
- Understand the use of Standard Operating Procedures
- Professional commitment to continuing education and training, and professional development in Laboratory Animal Science and Medicine

Quantum

0.5 ECTS / 12.5 hours

Communication skills

Background

The DV, but also laboratory animal veterinarians (LAVs) need to interact with a variety of professionals within and outside the establishment. The DV has a statutory responsibility towards the representative of the local establishment in addition to other government and professional bodies and also frequently interacts with persons that are responsible for projects or those that work with animals in order to provide advice on matters related to health and welfare of protected animals.

The module should include following topics:

The persons with a DV role and other LAV should establish communication lines with the following groups (the stakeholders):

- person(s) responsible for ensuring compliance with the provisions of the Directive (Article 20.2)
- person(s) responsible for overseeing the welfare and care of the animals in the establishment (Article 24.1)
- AWB (Articles 26, 27)
- personnel working with animals (Article 23)
- scientists responsible for projects (Article 24.2)
- line management
- laboratory animal science and veterinary association such as the AAALAC, International or National LAS associations
- diagnostic and other laboratories
- competent authority(ies)

Therefore communication skills should be encouraged either during training of other modules (e.g. opportunities for oral presentation of personal work) or through a specific communication training module.

A specific training module could cover the following aspects:

- understanding the principles of good communication and program/project and client management principles
- practical training in communication and presentation skills (i.e. team communication, oral presentations reporting preclinical research to colleagues/clients in-house or at a scientific meeting, reporting preclinical research involving laboratory animals in scientific journals, talking to the public about research etc)

Quantum

0.5 ECTS / 12.5 hours

Specific Competencies

Legal requirements

Background

This module should provide a relevant level of understanding of the national and international legal and regulatory framework within which projects involving animals are designed and managed and of the legal responsibilities of the people involved and may cover other relevant legislation. It should also include a specific focus on the responsibilities and duties of veterinarians related to animals used for scientific purposes.

The key requirement is a knowledge of the legal requirements of European legislation and it is recommended candidates should also make themselves familiar with its implementation via national legislation.

The module should include following topics:

- the national and EU laws and guidance which regulate the scientific use of animals and related animal welfare legislation and in particular the scope of activities of those carrying out scientific procedures involving animals
- the authorisations that are needed before acting as user, breeder or supplier of laboratory animals and especially the authorisation required for projects and where applicable, individuals
- the roles and responsibilities of the personnel involved in animal related research under 2010/63/EU
- the roles of the veterinarians and in particular of the designated veterinarian under 2010/63/EU
- the roles and responsibilities of the institutional animal welfare bodies (AWB) and the national committee for the protection of animals used for scientific purposes and who holds the responsibility for compliance
- which species are included in the scope of the Directive, which procedures are regulated under National legislation (minimum threshold of pain, suffering, distress or lasting harm) and who bears primary responsibility for the animals undergoing procedures
- the circumstances in which animals under the scope of the Directive should be humanely killed or removed from the study to receive veterinary treatment and the legislative controls over the killing

Quantum

3.0 ECTS / 75 hours

Veterinary input to Ethics, animal welfare and the 3 R's

Background

As an expert in animal health and welfare, the veterinarian holds a key position in the review and approval of all animal care and use in the institutional programme and in the implementation of the Three Rs. This includes advising on the design and performance of experiments using animals as related to model selection, endpoint determination and methods and techniques proposed or in use.

This module should provide guidance and information to enable individuals working with animals to identify, understand and respond appropriately, to the ethical and welfare issues raised by the use of animals in scientific procedures and to understand and apply the basic principles of the Three Rs.

The module should include following topics:

- the differing views, within society, relating to the scientific uses of animals and contribution of compliance with ethical principles in animal related research to the long-term trust and acceptance in scientific research from the general public
- the responsibility of humans for animals used in scientific research and the importance of having a respectful, compassionate and humane attitude towards them
- the ethical framework requirements entailing the application of the Three Rs, the harm/benefit assessment, to minimise the harm and maximise the benefits and the promotion of good animal welfare practices
- the 'Five Freedoms' concept's application to the laboratory animal species
- the concept of harms to animals including avoidable and unavoidable suffering, direct, contingent and cumulative suffering, use of humane end points, and how it relates to the severity classification system
- the regulations regarding re-use of animals and the central role of veterinarians in re-use
- Legal, practical and ethical issues on re-homing after use of animal in research
- the importance of good animal welfare and a culture of care and its effects on the scientific outcomes and on the societal and moral reasoning
- the relevant sources and search tools of information relating to ethics, animal welfare and the implementation of the Three Rs and alternatives (e.g. systematic reviews, meta analysis, EURL ECVAM Search Guide, NC3Rs etc)

Quantum

4.0 ECTS /100 hours

Veterinary input to the care of animals and the management of animal facilities used to house and use animals

Background

The veterinarian, with any management responsibilities and broad overview of the system, can provide input which will benefit the whole organisation, balancing the efficiency without compromising animal welfare. The veterinarian is well placed to contribute to the culture of care by promoting a team approach and facilitating communication.

This module should provide an introduction to the basic principles of animal behaviour, care, biology and husbandry. It should incorporate information in relation to anatomy and physiological features, including reproduction, behaviour and routine animal husbandry and enrichment practices.

The module should include following topics:

- basic anatomy, physiology, reproduction and behaviour of the relevant species
- the events that have the potential to cause suffering including sourcing, transport, housing, husbandry, handling and experimental procedures
- the environment in primary and secondary animal enclosures
- the importance of an enriched environment (appropriate to both the species and the science) including social housing and opportunities for exercise, resting and sleeping
- the dietary requirements of the relevant animal species and how these can be met
- the principles of bio-exclusion and bio-containment protecting the health status i.e. quality of animals and resulting science, engineering solutions in support of maintenance of high level of hygiene and sanitation within animal unit, waste categorisation, waste management and its safe disposal
- the principles of effective housekeeping, application of suitable storage facilities and practices, division to clean and dirty zones/corridors
- the benefits of application of quality assurance standards for animal facilities (ISO, AAALAC, GLP etc)
- the biological consequences of transport, acclimatisation and husbandry conditions and routine handling on the species concerned and ways to minimise them
- the alterations to the genome and its effects on the phenotype, monitoring genetically altered animals (adequate genotyping and nomenclature of GAA)
- the different methods for marking individual animals, maintenance and interpretation of accurate records of animals held in the animal unit

Quantum

5.0 ECTS /125 hours

Animal health and related topics (hygiene, OHS...)

Background

As an expert of the animal health and welfare, the veterinarian plays a key role to maintain high level standards in health monitoring and hygiene. This module should provide information on various aspects of animal health, care and management including environmental controls, husbandry practices, diet, health status and disease. It should also include relevant basic learning outcomes relating to personal health and zoonosis. Moreover, a specific emphasis should be put on the potential effects of health issues on research. The scope should be appropriate to common species used in research in Europe and those under the care of the veterinarian. The overall depth of knowledge should be suitable to provide adequate contemporary clinical standards

The module should include following topics:

- the procedures for ensuring health, welfare and care of animals during their transport
- the breeding programmes and husbandry practices suitable for the maintenance, care and welfare for a range of animals used in research
- the species-specific diseases (infestations and relevant microorganisms infecting laboratory animals such as their classification, the potential impact on research and animal health, their zoonotic potential, their prevention, diagnosis, treatment and eradication, clinical appearance, aetiology and pathology of common laboratory animal diseases, FELASA guidelines for health screening)
- the monitoring of suitable environmental and housing conditions for laboratory animals and the consequences for the animal resulting from inappropriate environmental conditions (e.g. disruption of circadian or photoperiod)
- the potential disease risks in the animal facility, including specific predisposing factors which may be relevant (e.g. GA and immunocompromised animals)
- the appropriate ways of water and diet provision for laboratory animals including the quality control of suitable foodstuffs and water at points of sourcing, storage and presentation to animals
- the methods of safe and humane handling, individual marking, sexing and restraint of species used in scientific procedures
- the basic principles of disease surveillance, prevention and management (e.g. including use of barriers, different containment levels, use of sentinels as relevant to the species and type of research carried out etc.)
- the human health hazards associated with handling laboratory animals (LAA, zoonosis, injuries, bites etc)

Quantum

4.0 ECTS /100 hours

Anaesthesia, analgesia and euthanasia

Background

Although veterinarians have received full training on this topic during their studies, this module should give them species-specific information on pain assessment in experimental animals and on how to alleviate pain and distress. Specific information on the impact of various drugs used on research should be addressed. It should also provide information regarding severity classifications, cumulative severity and the use of humane endpoints and euthanasia.

The module should include following topics:

- the species-specific desirable behaviour and appearance in the context of environment and physiological status and signs of positive well-being
- the recognition of discomfort, pain, suffering, and distress in relevant species
- the principles of pain, suffering and distress management
- the circumstances when anaesthesia or analgesia may be necessary to minimise pain, suffering, distress or lasting harm (bearing in mind the nature of experiment and potential adverse effects pain and analgesic drugs could have on scientific outcome)
- the appropriate use of oral, injectable, topical and inhalation anaesthetics (or dissolved agents in the case of aquatic species) and/or analgesics, related equipment, sedation/local/general anaesthesia
- the use of combinations of anaesthetic and analgesic agents as part of a balanced anaesthetic regime
- the differences in species/strain susceptibility to analgesics/anaesthetics
- the different levels and planes of anaesthesia (voluntary excitement, involuntary excitement, surgical anaesthesia (light, medium & deep), excessively deep)
- the assessment of depth of anaesthesia through assessment of reflex responses (e.g. righting, swallowing, palpebral, pedal, tail and ear pinch reflex), through monitoring clinical signs and/or electronic apparatus (large laboratory animals)
- the methods of optimising post anaesthetic recovery (e.g. heat blankets, analgesia, reversal agents, access to food and water, environmental conditions) to ensure a smooth and rapid recovery from anaesthesia
- the clinical and other methods available for assessing and recording the welfare of animals e.g. scoring sheet
- the clinical criteria to be used to set humane endpoints, refining methods to finish at an earlier endpoint
- the principles of euthanasia, confirmation of death and safe disposal of cadavers

Quantum

4.0 ECTS /100 hours

Experimental procedures and surgery

Background

This module should provide veterinarians the theoretical information about appropriate methods of animals' handling and restraint, minor procedures not requiring anaesthesia and life threatening surgical procedures requiring advanced anaesthesia before trainees get training in the practical aspects of these skills, under supervision. The module should therefore describe appropriate techniques for injection, dosing and biological tissues handling and sampling techniques relevant to the type of tissue and the animal species. It should also cover principles of peri-operative animal assessment and care, preparations for surgery including instrument and equipment preparation and aseptic techniques and the principles of successful surgery and post-operative care and monitoring along with information about possible complications of the healing process. Moreover, as veterinarians could be involved in the training of the personnel, they should have expertise in the area (see point viii below).

The module should include following topics:

- the methods and principles of handling animals as part of experimental procedures (including methods of manual restraint, chemical restraint and use of restrainer) and biological impact of procedures and restraint on animal physiology
- the refinement opportunities for procedures and restraint e.g. through training (using positive re-enforcement), habituation/conditioning, preference tests and socialisation of animals, relevance of pre-operative assessment
- the techniques/procedures including injection, sampling, formulating and dosing techniques (vehicle/solvent content, pH, routes/volumes/frequency regime), dietary modification, gavage/catheterisation, tissue biopsy, behavioural tests, use of metabolic cages etc
- the surgically altered animals (microsurgical interventions, operating microscope, implantation of indwelling catheters, miniature pumps for continuous infusion of the test/therapeutic, telemetric monitoring devices etc)
- the consistency in conducting scientific procedures and the correct handling, storing, recording, ensuring traceability of samples
- the preparation of personnel, animals, instruments and equipment for aseptic surgery
- the processes of tissue healing, the importance of asepsis and hygienic practices in relation to it, wound and scar creation, the principles of tissue handling and debridement, selection of suitable surgical instruments and different suture patterns, suturing materials and needles,
- the selection of wound dressing materials, animal jackets and protective collars
- the methods of optimising post-operative recovery and monitoring (e.g. use of heat blankets, analgesia, reversal agents, rehydration strategies, easy access to water, food, appropriate environmental conditions, individual health charts)

Quantum

3.5 ECTS / 87.5 hours

Veterinary input to experimental design

Background

The veterinarians need to be updated with developments in laboratory animal science and technology so as to ensure good science and animal welfare; should be able to develop, manage and control a programme of work in order to achieve its stated objectives, while ensuring compliance with the terms and conditions of any regulation governing the project. This includes practical implementation of the Three R's throughout the programme of work.

The module should include following topics:

- the arrangements relating to project licence management, e.g. procedures for ordering animals, special permits for ordering GAA, accommodation standards, disposal of animals, safe working practices and security, and the actions to take in the event of unexpected problems arising with any of these
- the principles of a good scientific strategy that are necessary to achieve robust results, including the need for definition of clear and unambiguous hypotheses, good experimental design, experimental measures and analysis of results and consequences of failing to implement sound scientific strategy
- the different search tools (e.g. EURL ECVAM Search Guide, Go3Rs) and methods of search (e.g. systematic reviews, meta-analysis)
- the scientific, ethical and welfare factors influencing the choice of an appropriate animal (or non-animal model), their origins, estimated numbers and life stages
- the necessity of pilot experiments when developing/implementing new procedures/methods/models
- the rigorous scientific technique and the requirements of assured quality standards such as GLP
- the concept of variability, its causes and methods of reducing it (uses and limitations of isogenic strains, outbred stocks, genetically modified strains, sourcing, stress and the value of habituation, clinical or sub-clinical infections and basic biology)
- the possible causes of bias and ways of alleviating it (e.g. formal randomisation, blind trials and possible actions when randomisation and blinding are not possible)
- the variables affecting significance, including the meaning of statistical power and “p-values”
- the formal ways of determining of sample size (power analysis or the resource equation method)
- the different types of formal experimental designs (e.g. completely randomised, randomised block, repeated measures (within subject), Latin square and factorial experimental designs)
- the appropriate statistical methods, causes of biological variability, consistency between experiments

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- the importance of dissemination of the study results irrespective of the outcome and key issues to be reported when using live animals in research e.g. ARRIVE guidelines
- the legal requirements for retrospective assessment (RA) of projects, requirements and principles for identifying projects subject to RA, and other factors impacting on the selection of projects for RA.
- the requirements for, and controls on, re-homing of animals, relevant re-homing guidelines

Quantum

3.0 ECTS / 75 hours

Veterinary input to Training of persons/competence assessment

Background

The training of personnel participating in LAS related activities often follows a multidisciplinary approach in which experts are invited to provide training in their focused area of expertise. In this context, veterinarians have a professional responsibility of ensuring that activities normally considered as acts of veterinary practice under National laws are performed in accordance with standards accepted by the veterinary profession, whether they are performed by veterinarians or by other persons allowed to perform such activities under Directive 2010/63/EU. Veterinarians have a solid base of knowledge and expertise in comparative pathology, diagnosis, prognosis, disease prevention and treatment, anaesthesia and surgery, pain recognition and control, breeding control, and euthanasia that is relevant to laboratory animals. They are therefore potentially qualified, with appropriate training-in-training, to provide training, assessment and supervision on what is considered to be veterinary interventions for scientific procedures.

The person responsible for training and competence should oversee the following tasks, therefore this module should offer to veterinarians training on the following aspects:

- How to set and monitor the required standards for the institution for training, supervision, competence and CPD for each of the functions in Article 23(2)(a–d); 26
- How to communicate requirements/expectations (for example identified training needs to all staff concerned and ensuring that staff are aware of their individual responsibilities to train/supervise and/or to be trained and supervised, until competent, as appropriate to their expertise and their function
- How to communicate to trainers
- the identification of appropriate training (modules, species and specific techniques) of recognised quality
- the development of local requirements for training records to be used throughout the establishment; ensuring that mechanisms are in place to identify new training needs
- the management of training records and identification of any new training which might be required
- Involvement in training/supervision/assessment

Quantum

2.0 ECTS / 50 hours