Guiding principles to help deliver the ethics learning outcomes of module 2
for personal licensees

Laboratory Animal
Science Association

RSPCA

These guiding principles for delivering the ethics learning outcomes in personal licensee training courses are intended as a 'living document' and a basis from which individual training resources can be developed. Comments and ideas for improving the content or clarity of the document are welcomed; please send these to the LASA secretariat at: info@lasa.co.uk.

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Introduction

Delivering - and assessing - the ethics learning outcomes in personal licensee (PIL) training courses ([EU functions A and B](#) [1], Home Office PIL courses) is an important component of licensee training, yet experience shows that this is not easy. There is often limited time and resource available for the course as a whole. As a consequence, current licensee training may not be able to deliver the intended long-term effects on attendees' knowledge, understanding, attitudes and behaviours. Therefore, it is clearly important to find ways of maximising the impact of what can be delivered in the time available. Trainers, particularly those delivering module 2 '*Ethics, Animal Welfare and the Three Rs*', have reported that they would welcome guidance on how to achieve the ethics learning outcomes. Access to up-to-date training resources would also be helpful. This document aims to address these needs by focussing on the relevant ethics learning outcomes of EU module 2 for personal licensees (see [appendix 1;](#) module 2 is also a 'core module' for project licensees although, in addition, they are required to do module 9 which addresses the same issues in greater depth).

The first part of the document deals with general principles and addresses the following points:

1. The overall aim of ethics training - what each learning outcome should cover and what the overall outcome for personal licensees should be.

2. What ethics is, why it is important, and how it relates to the use of animals in research.

3. The principles underlying good practice in teaching this topic, such as the need for a relevant and practical approach that integrates ethics throughout the whole training course.

The second part of the document focusses on the practical aspects of delivering the learning outcomes (LOs) of module 2 that specifically relate to ethics. Not all the fourteen LOs directly address this topic; those that relate to the 3Rs, animal welfare or legislation (see those in italics in [appendix 1](#)) are practical issues that are generally easier to address, and many can also be dealt with as part of other modules. For example, LO 2.9 on severity classification is also dealt with in module 5; LO 2.11 on 'the importance of good animal welfare for good science' also appears in module 3. They are, however, based on ethical principles and it is important to make this clear when delivering them.

A number of learning outcomes, however (i.e. LOs 2.1. to 2.4 and 2.12), are *directly* linked to ethics and part 2 of this document focuses on these. It highlights how they could be addressed and delivered and the key points to get across, as well as suggesting some useful resources and opportunities for CPD (e.g. via the Animal Welfare and Ethical Review Body).

PART 1: GENERAL PRINCIPLES

1.   Overall aim of the ethics learning outcomes

On completion of the ethics aspects of EU module 2, trainees should understand what ethics is (see definition in section 2 below) and be clear about the practical application of ethical values to animal research. They should be able to identify the ethical issues within their own work and that of the establishment as a whole, and see how ethics is integral to establishing and maintaining a culture of care. They need to understand the importance of maintaining an open mind and respect for other people's opinions, perspectives and beliefs, of acting responsibly at all times, and of accepting the consequences of their actions for animals and other people.

The aim, together with the other modules in the course, is to create thoughtful and reflective licensees, who are prepared to challenge themselves and strive for continuous improvement in the work that they do. They should be better able to think through the harms, benefits and justification for their work whatever their role or level of input. They should feel able and comfortable to question and, where necessary, challenge practices based on the "I've always done it like this" way of thinking and operating, thus helping to ensure good science with minimal animal use and suffering.

2.   Defining ethics and why it is important

Trainees need to be clear that attitudes, decisions and laws regarding the use of animals in science are based on an ethical framework. They need to understand the ethical components of such frameworks and how they are identified, developed and applied in practice.

The following points in this section list the main issues to address. These could be developed into a pre-course handout with references or links to further reading.

(i)   What is ethics?

Arguably, everything starts with ethics. Ethics is a **system of moral principles** that includes ideas about right and wrong, and how people should, or should not, behave in general and specific instances. The term is used in several ways including:

- to describe ways of life (for example, Buddhist or Christian ethics);

- to help define practitioners' rights and responsibilities within professional codes of conduct and provide guidance on what are good or bad moral decisions. Examples are the World Medical Association Declaration of Helsinki for medical ethics [2] and the UK Code of Conduct for Veterinary Surgeons [3]. In science, both funders and journals have ethical guidelines defining the research they will fund and publish [4,5];

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- interchangeably with the term 'moral' in public life to describe 'desirable' and 'undesirable' behaviour - what ought and ought not to be done.

Societal views evolve over time. Activities or actions that are considered acceptable today may be considered unacceptable in the future. This has been very noticeable in animal research as advances in our understanding of animal suffering and animal sentience has led to a greater commitment within the research community and wider society to reduce animal use, reduce suffering and improve the welfare of those animals that are used.

(ii)   Ethics and the law

Behaving ethically and legally are not always synonymous. Laws take time to create or amend and, in our rapidly changing world, some may not reflect current ethical values or thinking. Moreover, behaving ethically involves more than just following the letter of the law [6.] Laws such as the Animals (Scientific Procedures) Act 1986 (ASPA) [7] lay down certain baseline rules and boundaries, but within these there is room for judgement about what it is, and is not, ethically acceptable.

(iii)   Ethics and philosophy

Ethics is part of the academic field of moral philosophy. This has an extensive theoretical base commonly divided into three areas[8]. **Meta-ethics** deals with the nature of moral judgement, exploring the origins and meaning of ethical principles. **Normative ethics** is concerned with the content of moral judgement and the criteria for what is right or wrong. **Applied ethics** deals with the practical application of moral considerations. Understanding how to make sound choices, and providing a framework for deciding how to make them, is particularly relevant to many societal concerns such as abortion, biotechnology, gene therapy and artificial intelligence.

Applying ethics *in practice* to the use of animals in science under the ASPA is most relevant to licensees and should form the basis for ethics training.

(iv)   Ethics and the use of animals in science

The most obvious application of an ethical framework is that of the harm/benefit analysis that is at the centre of drafting and reviewing a project licence. However, day-to-day decisions have ethical aspects that require recognition and careful consideration of competing human and animal interests, and it is important to get this message across. For example, it may be thought that the use of analgesia or an enriched environment will interfere with aspects of the science, whereas the alternative view is that these are essential for the wellbeing of the animals. Practical ethics involves exploring the different opinions and perspectives behind such dilemmas in order to determine what is regarded as the best solution in each case.

(v)   Common misconceptions

It is also important to understand the broad remit of ethics and to avoid misconceptions. For example, in the field of animal research, ethics is often equated just with implementing the 3Rs and improving animal welfare. However, although both these issues concern the reduction of overall animal suffering and are thus a factor in ethical decision-making, ethics encompasses a much wider set of considerations and reflection about what it is justified to do to animals in the name of science.

A second misconception is that debate over animal experiments exists solely in terms of the polarised extremes. However, public opinion is much more nuanced than this, encompassing a wide diversity of perspectives. On balance, the public are 'conditional acceptors' of animal experiments but *only* provided that these are carried out to high legal, animal welfare, scientific and *ethical* standards [9].

In summary

- Ethics is a system of moral principles that encompasses ideas about right and wrong, and how people should, or should not, behave: a 'we can – but should we?' approach.

- Willingness to listen open-mindedly to differing opinions, perspectives, beliefs and values, whether in the context of culture, religion, experience or society, is key to taking part in ethical discussions with integrity.

- Although it may be helpful to understand the philosophical background, the key aspect for licensees is **practical ethics** and how this relates to science and their own work.

- Ethics provides an approach for decision-making when faced with disagreements and dilemmas.

- Such dilemmas require careful identification and consideration of all the relevant issues, competing interests and perspectives; ethics helps reconcile disagreement and contributes to sound and consistent decisions.

- Ethics applies throughout a licensee's day-to-day work and is not confined to the ethical review within project evaluation.

- Applying the 3Rs alone does not equate to 'doing ethics' - practical ethics encompasses a much wider set of considerations about what it is, and is not, acceptable to do to animals and for what purpose.

3. Good practice teaching principles

It is important for trainees to recognise that licensee training is not just about acquiring a personal licence. The modules have been carefully developed by laboratory animal scientists across Europe and are designed to give licensees a good foundation for their future work.

Training content and delivery therefore needs to be *relevant to the participants*. In the case of ethics, this means that a didactic lecture on moral philosophy is unlikely to be useful. Nevertheless, as stated above, trainees need to understand the ethical issues around the use of animals and why this is important in their work. It is therefore a good idea to define these at the start of the course, since all other aspects of the course including legislation, welfare, husbandry, 3Rs and harm/benefit analysis are based on ethical principles. This could be done as a short talk or discussion session using the information in section 2, with additional information and references (e.g. on different ethical perspectives) provided as a pre-course handout for those who want more detail.

Such face to face interaction needs to be related to any pre-course learning to ensure that this is consolidated. Some (simple) ethical principles using *local examples,* or examples otherwise relevant to the trainees, could be described and these could then be built on by 'spiralling' the ethical discussion throughout other elements of the course (see box). This means explaining how issues in other modules, such as husbandry, pain and distress, handling, and breeding and colony management, all have ethical elements.

It can help trainees 'normalise' the application of ethics if they see it as an issue that pervades not only science in many contexts, but also day-to-day life whenever decisions have to be made about what should or should not be done in any

Spiral curriculum

A spiral curriculum is an educational approach that involves the student re-visiting the same topics over the course of their education. This iterative approach helps to reinforce learning over time, using prior information to deepen understanding of the subject, consolidate learning and inform students' approach to future learning. It stems from a behaviourist theory that spaced repetition of learning is the most helpful way to deepen understanding and promote long-term retention of information.

According to Bruner (p. 141), there are three components to this approach:

1. **Cyclical**: the student returns to the same topic several times during the course of their study

2. **Complexity**: each time the topic returns, it is explored in more depth/ complexity

3. **Prior knowledge**: the knowledge gained previously is used, so that students explore the topic from a certain level of understanding, rather than starting from fresh each time [10].

Developing a spiral system of learning (e.g. for ethics) requires an integrated approach between tutors for different parts of the course, such that the whole course hangs together and is delivered in a connected way [11].

given situation. It is also helpful to note the application of ethics in ensuring research integrity [12] and to explain that applied ethics is also important in other contexts such as professional medical and veterinary ethics, research funding and publishing. Explaining that ethical principles permeate the culture of care [13], which encompasses the way both animals and staff are treated, helps to emphasise further its importance and practical application. A good discussion example to use here would be the ethical issues around humane killing of animals - whether loss of a life is in itself a harm and how killing animals affects those who have to carry this out.

Aside from setting out the definitions and principles relating to ethics, the topic is best addressed by guided discussions, preferably in small groups. A discussion session, that brings together all elements of the learning outcomes, at the end of the whole training course, when students are likely to be more communicative, can work well and is recommended.

There are now a wide range of polling devices which can be used to gather responses anonymously and stimulate discussion of a variety of ethical dilemmas or statements if participants are reticent about speaking up. Ideally, when courses are run in-house it is helpful to bring in the named people and/or existing personal or project licensees to contribute to discussions and provide their personal views on ethical issues, other aspects of the module and the course as a whole. It may also be possible to make use of the range of research interests and ethical viewpoints within different research groups. These can range from basic to translational research to animal welfare and conservation studies. This will help trainees see the diversity of views and perspectives that can be present even within an establishment.

The AWERB and the Home Office Liaison Contact (HOLC) could both be a helpful source of in-house examples for discussion (assuming this is permitted), for example where a project proposal has generated a lot of debate during a committee meeting. This could provide a local resource showing: what made the AWERB think; why the proposal raised ethical concerns; whether everyone agreed; and how the issue was resolved. It should be possible to develop some case studies to discuss in the course and then put the 'real life solution or agreement' up at the end of the discussion. Asking the AWERB chair to introduce the issue would have the additional function of raising trainees' awareness of the AWERB and its role.

3.1   Pre-course work

Pre-course work helping trainees understand the ethics learning outcomes and what will be expected of them will facilitate better use of the teaching time available (see The Flipped Classroom box). This can also help provide a more consistent starting position when trainees come from different educational backgrounds and/or cultures.

Pre-course work should not only provide information (e.g. on what ethics is, as mentioned above and see reference list) but also stimulate thinking. Some options are:

- an activity, such as providing a scenario for students to think about and discuss later in group work; or asking students to set out their own ideas on ethical dilemmas in life generally or specific to their work;

- delegates could also be presented in advance with a range of scenarios and score these for whether or not they are 'acceptable' or 'not acceptable'. These could be collated and used as a discussion prompt in class: why did you make this response? did you consider this? is there is a split of opinion in class or a consensus? Following the ethics section of the course, the same questions could be asked again to see if trainees' opinions change;

- online facilities also offer the possibility of increasing the interactivity of pre-course work. For example, participants can be faced with iterative choices of dilemmas based on their previous choices.

> **The Flipped Classroom**
>
> Traditional lecture-based teaching can be a passive form of education. The "Flipped classroom" is a learning methodology that aims to facilitate deep learning, better retention and critical thinking by moving some information-transmission teaching out of the class. Students are required to complete pre (and/or post) classroom activities or assignments (some taking advantage of technological innovations) which are then used for active learning (e.g. problem solving, case studies, discussion groups) during the crucial class time with a teacher [14-16].

Further examples are given in the tables in Part 2.

3.2 The importance of feedback

As with all forms of training, it is important to ask course attendees to evaluate the ethics component. Has it been helpful and worthwhile? Has it allowed them to reflect on the issues? Has it been successful in addressing the learning outcomes? The feedback must then be used to inform and improve the course.

3.3 The importance of CPD

A single session on ethics during licensee training will not be sufficient to encourage trainees to think routinely about the ethical implications of their own work and that of others. It is therefore important to use other opportunities such as lectures, workshops or dedicated training sessions as CPD to reinforce the initial messages and stimulate further thought and reflection (see spiral curriculum and flipped classroom boxes above). The AWERB in its role as providing a forum for discussion and development of ethical advice could be a useful resource in this respect [17] (see appendix 2).

Summary

Good practice points...

☺ Explain what ethics is, why it is important and how it relates to animal research.

☺ Use local examples as illustrations of where ethical debate has occurred.

☺ 'Normalise' ethics e.g. by reference to ethics in daily life, other professional codes of conduct and with respect to research integrity.

☺ 'Spiral' (i.e. refer to) ethics throughout the whole course and pick out examples of how it relates to other topics such as legislation, welfare, humane science.

☺ Show how ethics relates to licensees' own work and encourage them to reflect on this.

☺ Allow as much time as possible for the course including time for discussion.

☺ Bring in named persons, scientists or staff from other disciplines (e.g. medical ethics) to participate in discussions.

☺ Re-enforce the ethics learning outcomes in the rest of the module and in other modules where relevant.

☺ Make the course interactive - and ensure trainees are 'engaged'.

☺ Ask the trainees for feedback and use it to tailor and improve the course.

☺ Ask the AWERB to organise ethics-related activities.

Things to avoid...

☹ Covering ethics with a half hour lecture at the start and then putting it aside for the rest of the course.

☹ Delivering theoretical lectures on utilitarianism, deontology, virtue ethics etc.

☹ Quoting historical philosophers and expecting trainees to know the relevance of their names.

☹ Confusing ethics with the 3Rs and animal welfare.

☹ Interpreting it as the polarised extremes of animal rights versus legitimate science.

☹ Imposing your views on others; stating there is 'only one right way.'

☹ Implying that ethical beliefs, perspectives and dilemmas are static and cannot change over time.

☹ Dumbing down the importance of ethics.

☹ Making it boring!

PART 2: SOME PRACTICAL EXAMPLES FOR USE IN TEACHING

The following tables present the key points to cover under each of the ethics learning outcomes (LOs), together with ideas in the right-hand column of how these points could be addressed. Learning outcomes addressing similar issues are coloured similarly since there may be overlap between them and how they are delivered.

Learning outcome 2.1: Describe the differing views, within society, relating to the scientific uses of animals and recognise the need to respect these.

Key points to get across:	How delivery could be achieved:
• There is a wide range of opinions on the use of animals in science and views are now quite nuanced. • The polarised animal experimentation debate (pro- vs anti-vivisection) is outdated and trainees need to recognise this, and that it is unhelpful to present society's views in this way. • Trainees need to think beyond the polarised extremes and recognise that focussing on this type of debate prevents people addressing the real ethical issues in their work. • It is important to be open-minded, listen to and respect other peoples' views and try to understand the basis for these. • People's views – and hence ethical values - are constantly evolving. Their views will also depend on their country of origin, culture, individual background and experience, circumstances, age and gender. Views are also affected by the type of use, species and age of animals.	• Start by presenting a series of viewpoints on the use of animals and ask trainees to identify their position in the spectrum of views with their reasons. Repeat at the end of the course/module. • Ask trainees to define what 'respecting other peoples' views' means to them. Collate their thoughts and use these as a platform to promote discussion. • Use examples of research that was once considered acceptable (either its purpose or how it was done) but is not thought so now. Examples include using death as an end-point and tail tipping for genotyping. Where training is in-house, try to use local examples to make it directly relevant e.g. a Contract Research Organisation (CRO) may no longer be prepared to test certain types of product or carry out particular tests requested by a client; a research institute may decide not to carry out any research that causes severe suffering or use certain species.

Learning outcome 2.2: Describe the responsibility of humans when working with research animals and recognise the importance of having a respectful and humane attitude towards working with animals in research.

Key points to get across:

- This LO links to module 1 on national legislation, so it is helpful to refer to details of the legislation to re-enforce the responsibility message.

- Everyone coming into contact with animals has a responsibility to treat them with respect and consideration, minimise use and suffering and raise issues of concern so that safeguards can be implemented or maintained. Good welfare and thoughtful use of animals in experiments is essential for good science.

- The use of animals is a privilege not a right. The ASPA sets minimum standards for deciding whether and how animals are used (see module 1: national legislation), but trainees have a responsibility to try to improve on these: i.e. to implement the *spirit* of the ASPA not just the letter of the law.

- PIL standard conditions set out the specific responsibilities of personal licensees for the welfare of the animals they perform procedures on.

How delivery could be achieved:

- Ask trainees to describe their impression of a day in the life of lab animals and of the impact on animals of a procedure they have seen used. Then discuss within the class whether they have accurately represented the harms/welfare issues, including lifelong harms, or underplayed these.

- Introduce a discussion on transparency and reporting and ask trainees under what circumstances they would feel able to raise concerns about a colleague.

- Introduce concept of professionalism and integrity in research and ask trainees to discuss their thoughts on appropriate professional behaviours with regard to both animals and people.

- Ask trainees to read the PIL standard conditions and identify any that they think are *not* relevant to their area of work.

Learning outcome 2.3: Identify ethical and animal welfare issues in their own work and be aware and able to reflect on the consequences of their own actions.

Key points to get across:

- Ethics encompasses not only *how* an animal is used, but also *whether* an animal is used i.e. the justification for the research. Too often ethics is interpreted only in terms of animal welfare and application of the 3Rs. Both of these issues are important as they concern the reduction of animal suffering and are thus a factor in ethical decision-making. However, ethics encompasses a much wider set of considerations about what it is justified to do to animals in the name of science.

- Application of the 3Rs to reduce animal use and suffering and enhance animal welfare must be considered throughout the lifetime of the animal up to and including euthanasia.

- The importance of constructive criticism (by and to themselves), of being able to challenge assumptions, and of thinking more broadly about the wider implications of their work for society at large.

- The sanctions that can be applied if PILs do not consider the consequences of their actions.

- Methods are updated and refined and what is considered acceptable changes over time. Use of "we've always done it this way" as an argument for maintaining unrefined and poor practice does not advance the quality and utility of science.

How delivery could be achieved:

- Use examples (preferably local and targeted to the work trainees will be doing) to illustrate how to identify ethical issues, to start them thinking. Seek peer support from existing thoughtful licensees or AWERB members.

- Describe a surgical procedure (and potential harms) in a rat (e.g. an IV cannula with tether) without context and then for a range of research purposes. Ask whether the research context changes how the trainees feel about the harms caused to the animal.

- Provide a section of a project licence or grant proposal and ask trainees to identify the ethical issues within it.

- Ask trainees to give an example of (i) an ethical and (ii) a welfare issue. Review their suggestions, making sure they recognise that ethics is not just about welfare, and discuss.

- Show how to design a procedure that is appropriate to the experimental aims and causes the least harm to the animals and visit the facility to illustrate this; use simple examples of common procedures that people can relate to when putting experiments together.

- Ask them to think through:
  - What questions would I ask of my study before I start?
  - What questions should I ask at the end?

- How would I describe the benefits of the work and how/why do they outweigh the harms?
- How would I justify my work to myself and my colleagues, the Home Office Inspector, or a stranger?

- Use discussion topics to consider the ethical issues around animal use for studies/procedures such as:
  - research into diseases caused / worsened by human behaviour e.g. pollution from vehicles and the effects this has on COPD; safety assessment of vaping; effects of night club noise on hearing; drug addiction studies;
  - development of brain organoids and their implantation into animals;
  - treating or triaging patients based on survival predictions (casualty, emergency situations, humanitarian aid);
  - cloning of agricultural or competition animals;
  - long term housing of animals; removal of enrichment for an experimental purpose.

- Provide an example of why a project was turned down.

- Turn trainees into an AWERB getting them to role-play different categories of staff with an example project licence to review.

- Use a dilemma website tool or ethical reasoning tool.

Learning outcome 2.4: Recognise that compliance with ethical principles may contribute to the long-term trust and acceptance in scientific research from the general public.

Key points to get across:

- Scientific research uses public money and is done 'for public benefit'. Therefore, information should be available to the public on what is done.

- Openness and transparency contribute to ensuring public trust and *conditional* acceptance of animal use. Explain the role and content of the non-technical summary (NTS) and the Concordat on Openness in this respect [18, 19].

- Accurate information is critical to informing opinion. A decision based on inadequate information on all the relevant factors is a prejudiced decision, not an ethical one.

- It is obviously acceptable to hold differing views, but opinions need to be based on correct facts, not rhetoric (from *any* source) and it is essential to be able to recognise and acknowledge the difference.

- Everyone can have their own beliefs, but all must work within the ethical framework of the ASPA.

How delivery could be achieved:

- Use good and poor examples from the NTS as discussion points.

- Use recent Mori poll information [9] – discuss the questions and responses and how trainees would have responded.

- As a thought-starter, ask trainees what would make them trust people working in a different field such as climate change or human cloning. What expectations would they have? Then relate this back to their own field and ethical values.

- Provide links to the Concordat on Openness and discuss what could be done to deliver it. Ask trainees what their own establishments do about openness and suggest they find out if they do not already know.

Learning outcome 2.12: Describe the need for a culture of care and the individual's role in contributing to this.

Key points to get across:

- All establishments must have a culture of care and trainees have a responsibility to find out about the elements of this.

- The definition and expectations of a culture of care and what this looks like in practice, emphasising it is for people (treating them thoughtfully and with consideration and respect) as well as for animals.

- The culture of care should define the local standards expected but, as individuals, trainees should always look for ways to improve current practice. They should lead by example and be aware of the effect their behaviour has on others around them.

How delivery could be achieved:

- The definition of a culture of care can be found in the RSPCA/LASA Guiding Principles on good practice for AWERBs [20] so this section of the document could be provided as a handout and talked through. The Norecopa International Culture of Care website [13] also has excellent information on the key factors which foster a culture of care with details of how this can be developed and promoted.

- Ask trainees to think about what the term means to them and what they think are the key components for their research group.

- Some trainers teach this later in the course bringing in the named people, AWERB members or project licensees to talk about their own role, expectations and experiences.

Learning outcome 2.13: Describe relevant sources of information relating to ethics, animal welfare and the implementation of the Three Rs.

Key points to get across:

- This LO is relevant to all other LOs and all modules.

How delivery could be achieved:

- Provide a handout with up to date references and links to useful websites.

- Provide information on the roles of all the named persons and the Home Office Liaison Contact (HOLC) and advise trainees to find out who they are.

- Advise trainees to sign up to key newsletters and to stay up to date.

Appendix 1: EU Module 2: Ethics, animal welfare and the Three Rs (level 1) [Core]

This module provides 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 generally and, where appropriate, within their own programme of work. It provides information to enable individuals to understand and to apply the basic principles of the Three Rs.

Learning Outcomes Trainees should be able to:

2.1. Describe the differing views, within society, relating to the scientific uses of animals and recognise the need to respect these.

2.2. Describe the responsibility of humans when working with research animals and recognise the importance of having a respectful and humane attitude towards working with animals in research.

2.3. Identify ethical and animal welfare issues in their own work and be aware and able to reflect on the consequences of their own actions.

2.4. Recognise that compliance with ethical principles may contribute to the long-term trust and acceptance in scientific research from the general public.

2.5. Describe how the law is based on an ethical framework which requires 1) weighing the harms and benefits of projects (the harm/benefit assessment) 2) applying the Three Rs to minimise the harm, maximise benefits and 3) promote good animal welfare practices.

2.6. Describe and discuss the importance of the Three Rs as a guiding principle in the use of animals in scientific procedures.

2.7. Explain the Five Freedoms and how these apply to laboratory species

2.8. Describe the concept of harms to animals including avoidable and unavoidable suffering, direct, contingent and cumulative suffering

2.9. Describe the severity classification system, and give examples of each category. Describe cumulative severity and the effect this may have on the severity classification.

2.10. Describe the regulations regarding re-use of animals.

2.11. Describe the importance of good animal welfare including its effect on scientific outcomes as well as for societal and moral reasons.

2.12. Describe the need for a culture of care and the individual's role in contributing to this.

2.13. Describe relevant sources of information relating to ethics, animal welfare and the implementation of the Three Rs.

2.14. Be aware of different search tools (e.g. EURL ECVAM Search Guide) and methods of search (e.g. systematic reviews [21], meta analysis [22]).

Appendix 2: Ethics and the AWERB

Ethics is integral to the functions and tasks of the AWERB as would be expected by its title. Ethics is specifically mentioned in two of the four key AWERB functions, including with respect to training i.e.:

- to provide a forum for discussion and *development of ethical advice* to the establishment licence holder on matters relating to animal welfare, care and use; and
- **to support named persons and other staff dealing with animals, on animal welfare,** ***ethical issues and provision of appropriate training***.

To meet the need for a forum for discussion, AWERBs could organise ethics related activities as suggested in both the 'Guiding Principles on good practice for Animal Welfare and Ethical Review Bodies' and the 'AWERB as a Forum for Discussion' documents [17, 20]. For example:

- considering whether an establishment wants to rule out certain types of work, or use of certain species or techniques; or how it deals with severe procedures;
- organising informal lunchtime discussions enabling people to bring novel ideas or consider controversial issues, or discuss their own work and its ethical implications;
- recruiting (to the above) someone from a related but different field to compare viewpoints e.g. a zoologist vs a lab animal viewpoint;
- appointing 'ethics champions' who can raise difficult underlying ethical questions;
- considering the emotional wellbeing of staff involved in killing animals;
- for people who have worked abroad, discuss what they are permitted to do in their country and whether and how this differs from the UK.

Making such discussions widely open to staff encourages them to understand and be more aware of ethical issues and consider the implications for their own work, so contributing to the culture of care. It also has the additional advantage of exposing AWERB members themselves to ethical discussions since many will probably not have had any ethics training unless they have attended the relevant modules.

Suggested background reading and resources

Bioethics
- Nuffield Council on Bioethics animal research web page:
  nuffieldbioethics.org/topics/animals-food-and-environment/animal-research
- Susan Gilbert, Gregory E. Kaebnick, and Thomas H. Murray, eds., *Animal Research Ethics: Evolving Views and Practices, Hastings Center Special Report* 42, no. 6 (2012): S1–S40.
  animalresearch.thehastingscenter.org/special-report/
- RC Simmons et al. (2018) *Bioethics and Animal Use in Programs of Research, Teaching, and Testing*. Boca Raton (FL): CRC Press/Taylor & Francis. pubmed.ncbi.nlm.nih.gov/29787201/
- Kraus, A. Lanny, and Renquist, David, eds. (2000) *Bioethics and the Use of Laboratory Animals: Ethics in Theory and Practice*. ACLAM. aclam.org/media/d9ecd55d-5edc-4fce-b0a4-9ad6e7705da0/P-RsCw/ACLAM/Publications/Bioethics_Kraus.pdf

AWERBs and ethical review
- *RSPCA/LASA Guiding principles on good practice for AWERBs:*
  lasa.co.uk/PDF/AWERB_Guiding_Principles_2015_final.pdf
- *RSPCA Lay Members' Resource Book*, Appendix A: What is Ethics: tinyurl.com/RSPCALMRB
- RSPCA/LASA/LAVA/IAT meeting report: *Putting Ethics into the AWERB*: tinyurl.com/AWERB-UK2017
- *RSPCA Ethical Review webpages.*
  science.rspca.org.uk/sciencegroup/researchanimals/ethicalreview
- Röcklinsberg H, Gamborg C, Gjerris M. (2014) A case for integrity: gains from including more than animal welfare in animal ethics committee deliberations. *Laboratory Animals* 48(1):61-71. doi: 10.1177/0023677213514220

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1. European Commission (2013) *A working document on the development of a common education and training framework to fulfil the requirements under the Directive.*
   ec.europa.eu/environment/chemicals/lab_animals/pdf/guidance/education_training/en.pdf
2. World Medical Association (2013) *Declaration of Helsinki*. wma.net/what-we-do/medical-ethics/declaration-of-helsinki/
3. Royal College of Veterinary Surgeons *UK Code of Conduct for Veterinary Surgeons.*
   rcvs.org.uk/setting-standards/advice-and-guidance/code-of-professional-conduct-for-veterinary-surgeons/
4. NC3Rs/BBSRC/Defra/MRC/NERC/Royal Society/Wellcome Trust (2019) *Responsibility in the use of animals in bioscience research: expectations of the major research councils and charitable funding bodies, 3rd edition.* London: NC3Rs. nc3rs.org.uk/responsibility-use-animals-bioscience-research
5. S Jarvis, JEL Day, B Reed (undated) Ethical guidelines for research in animal science (for publication in *Animal*) animal-journal.eu/instructions-and-policies/
6. Boyd KM, Higgs R, Pinching AJ (eds) (1997) A new dictionary of medical ethics. BMJ Publishing group: London.
7. Home Office (2012) Animals (Scientific Procedures) Act 1986 (ASPA).
   gov.uk/government/publications/consolidated-version-of-aspa-1986

8. Ethics from *The Internet Encyclopedia of Philosophy* (IEP) (ISSN 2161-0002) iep.utm.edu/ethics/

9. Ipsos MORI (2018) Public attitudes to animal research in 2018. ipsos.com/ipsos-mori/en-uk/public-attitudes-animal-research-2018

10. Bruner, J. S. (1960). *The Process of Education.* Cambridge, Mass: Harvard University Press.

11. Education Partnerships, Inc. (2012) *The Spiral Curriculum.* files.eric.ed.gov/fulltext/ED538282.pdf

12. UK Research Integrity Office (2019) *Research Integrity: A Primer on Research Involving Animals.* UKRIO, Croydon, UK. doi.org/10.37672/UKRIO.2019.01.animals

13. The International Culture of Care Network: norecopa.no/coc

14. Lakmal Abeysekera & Phillip Dawson (2015) Motivation and cognitive load in the flipped classroom: definition, rationale and a call for research, Higher Education Research & Development, 34:1, 1-14, DOI: 10.1080/07294360.2014.934336

15. Bouwmeester Rianne A.M. [et al.]. (2019) Flipping the medical classroom: Effect on workload, interactivity, motivation and retention of knowledge. *Computers and Education* 139: 118-128. doi.org/10.1016/j.compedu.2019.05.002

16. Anna Therese Steen-Utheim & Njål Foldnes (2018) A qualitative investigation of student engagement in a flipped classroom, *Teaching in Higher Education*, 23:3, 307-324, DOI: 10.1080/13562517.2017.1379481

17. RSPCA, LASA, LAVA, IAT, University of Nottingham & ESRC (2017) *Delivering Effective Ethical Review: The AWERB as a 'Forum for Discussion'.* view.pagetiger.com/AWERB/AWERB

18. Understanding Animal Research (undated) Writing Non-Technical Summaries: A Researcher's Guide. understandinganimalresearch.org.uk/files/5115/3235/6558/Writing_NTS_summaries.pdf

19. Concordat on Openness on Animal Research in the UK: concordatopenness.org.uk/

20. *RSPCA/LASA Guiding Principles on Good Practice for AWERBs* (2015) lasa.co.uk/PDF/AWERB_Guiding_Principles_2015_final.pdf

21. Systematic Review Center for Laboratory animal Experimentation (SYRCLE) radboudumc.nl/en/research/departments/health-evidence/systematic-review-center-for-laboratory-animal-experimentation

22. Carlijn R. Hooijmans, Joanna IntHout, Merel Ritskes-Hoitinga, Maroeska M. Rovers, Meta-Analyses of Animal Studies: An Introduction of a Valuable Instrument to Further Improve Healthcare, *ILAR Journal*, Volume 55, Issue 3, 2014, Pages 418-426, https://doi.org/10.1093/ilar/ilu042