Animal Ethics - Ten Tips for Writing a Successful Application

1. Writing with the purpose in mind

An Animal Ethics application is fundamentally different in nature to a research proposal, or a submission to a scientific publication. Its **singular function** is to enable the Animal Ethics Committee (AEC) to decide if the use of animals is justified - based on whether the scientific or educational value of the work outweighs the potential impact on the animals being used.

To do this, the committee must understand:

- why the work is proposed
- why animals are needed
- what will be done to the animals
- what impact the work will have on the welfare of the animals.

(A more detailed summary of the principle criteria which the AEC is obliged to apply in evaluating an application is provided in **Appendix 1**).

As information that is extraneous to this core rationale should not be included in the application, the wholesale "cutting and pasting" of text from previous research documentation can be inappropriate.

2. Writing for a non- scientific audience

AECs are constituted of both scientific and lay members, and decisions about applications must be made on the basis of all-member consensus.
Submissions that are unduly complex, or are loaded with dense scientific jargon and abbreviations, make it difficult for lay (and sometimes scientific) members to understand the purpose of the study, and the overall impact of the procedures on animals.

The "Lay Summary" in the application, which needs to include the background/context, statement of aims and description of what will be done to the animals, must be expressed in plain English that is readily understandable to an interested, intelligent person without a scientific background.

The title of the application should also be concise and similarly expressed in lay language.

In other sections of the application, such as the more detailed "Aims" and "Design" of the project should also be expressed, as far as possible, in plain English. Where this cannot be achieved, specialist terms should be defined where they first appear within the text, or a lay definition should be included in a glossary.

As well as avoiding unnecessary complexity, applicants should also:

- **Use direct and explicit language.**
  For example, AECs prefer the term "killed" to "sacrificed", or the term "died" to "succumbed" or "were lost".
- **Avoid statements that are unsubstantiated or indecisive.**
  The words "should' or "might" do not inspire confidence and statements such as "previous work suggests this number may be adequate" should be avoided. Similarly, unquantified measurements such as "a few days" or "a prolonged period" are unacceptable.
- **Read through the application to identify spelling, grammar and phrasing errors.**
  Format the text in Word as a first step. Once it is ready, copy and paste into the on-line form. This approach avoids text being lost.
  Often something as simple as a typographic error or poor phrasing can cause enough ambiguity within an application to prevent an approval. A couple of read-throughs, and/or proofing by a colleague, should help to avoid this.
  This is especially important when English is the applicant's second language.

3 Providing a clear narrative & chronology

The AEC must know exactly what is happening to each individual animal or group of animals within a project (including controls) from the time the animals are obtained until the project is completed.
The researcher must clearly illustrate:

- the number and type of procedures to be performed on each animal;
- the time interval between each and
- the potential impacts on the animals' welfare associated with each procedure.

Where multiple procedures are performed on animals, the narrative and chronology of events often becomes jumbled and confused within an application. It is important that inconsistency, obscurity and omission are avoided.

An excellent preliminary step for any project application is therefore the construction of a timeline (or flow diagram) which clearly illustrates the nature, number and method of procedures performed on animals, and the time interval between each.

A timeline acts as a comprehensive point of reference when developing the textual elements of the application. This approach helps the applicant to avoid omission errors, enables information to be reconciled across all sections of the application and reduces superfluous detail. When included in the application, a flow diagram also creates a powerful visual aid for committee members, giving them a solid framework in which to place the textual descriptions found in the application. A timeline can also focus an application on critical animal welfare issues, such as the incorporation of sufficient rest periods for animals between procedures, and the demarcation of project duration in terms of clear start and end-points for individual or groups of animals.

4 Including & reconciling all scientific information

A problem commonly identified by AECs is inadequate detail relating to scientific procedures, particularly drug administration. Where such detail is included, it is sometimes applied inconsistently across the application.

For all agents administered as research variables, applicants must ensure that details of dose rates, infusion rates, volumes and routes of administration are included and

reconciled across all sections of the application. It is often acceptable to give a dose range, rather than a specific dose. This avoids the need to apply for an amendment if the dose needs to be changed. For the same reason, the size of hypodermic needle should not be given. It is sufficient to state that a "needle of appropriate size" will be used.

Applicants should also provide a brief description of the mechanism of action and the anticipated impact on animals of each agent. Appropriate references should be included to justify dosage rates that are proposed. Inclusion of the timing of such treatments in the timeline would be advantageous.
When there is no previous data available, the RI should consider doing a pilot study to determine dosages, end points etc. See Section 7.

Details of drugs used for the management of animals, such as anaesthetics and analgesics, should not be included in the application, because these are all already specified in the IDAO. Simply state (for example) "the animal will be anaesthetised as per the IDAO".

Further information on this aspect of animal welfare is available on the Animal Ethics intranet page.

Where there is doubt about current best practice, consult the Animal Welfare Officer.

5 Justifying & minimising animal numbers

The number of animals requested for use in a project must be clearly justified in terms of statistical considerations and/or further requirements in the experimental design. This number can be definite, or a range, but not an approximation.
(An exception to this may be ecology projects where exact numbers cannot be predicted and are dependent upon the success of trapping. In these cases, use "0" in Section C, Animal Usage Statistics, in the application form.)

Justification of animal numbers needs to be made from the point of view of gaining data rather than simply representing what is achievable in terms of work schedule or financial considerations.
The application should therefore include, as appropriate, a statistical power analysis or an explanation of numbers based on requirements for tissue sampling, logistics/equipment etc.

Contrary to what researchers may think, the AEC might ask for more animals to be used in order that the results obtained are more meaningful, and less waste is caused in the long term.
Requested numbers should include pilot and control animals, and should explain How many animals are for contingencies at each stage of the experiment.
Total numbers of animals should be reconciled across text, tables, sub-totals and attachments, as there are often discrepancies in applications.

AECs need to be convinced that serious thought has gone into the optimisation and minimisation of animal use, and the replacement of animals in projects (the "3 Rs" - *Refinement, Replacement and Reduction*).

One area that is traditionally weak in applications is the identification of potential alternatives to animal use.
The Animal Welfare Act states that Animal Ethics Committees must:
"have regard to the extent to which there has been—
(i)assessment of the suitability of using non-sentient or non-living alternatives in the project; and
(ii)replacement of animals as subjects with suitable non-sentient or non-living alternatives".
Applicants are therefore required to provide details to the committee of the methods they used to ascertain that there are no suitable non-sentient or non-living alternatives to the use of animals in the research.

6 Assembling the right team

During the initial planning stage, the project supervisor must assemble a team that is competent to perform every task and procedure associated with live animal work.
The AEC needs to know who is responsible for ALL the work with animals, including husbandry and monitoring.
Specific tasks need to be allocated to named individuals who in turn have documented skills to carry out these tasks.
For each person named on an application the following details must be included:

- What they will do to the animals
- What experience they have of procedure(s) they will carry out on live animals, and in the specific techniques described in the project
- What training they will need, how such training will be provided and the details of the trainer

Before the animal ethics application is lodged with the AEC it is vital that all members of the project team are aware of the details of the project and have agreed to their allocated responsibilities via signed approval.

7 Piloting and/or staging the project?

Where novel techniques or experimental designs are proposed, and it is not clear what initial results will show, or whether adverse reactions may occur, AECs are typically cautious about allowing full animal numbers to be engaged in a project. **In these circumstances, it is advisable to build an exploratory pilot study into the project, or to apply for a standalone preliminary pilot study.**
This will confirm (or otherwise) the efficacy of the animal model/ experimental design, and establish details such as humane endpoints, dose rates/timings, or bias caused by gender/age issues, ahead of the full-blown project.

Similar approaches may be built into a staged experimental design. For instance, doses can be administered and assessed sequentially (i.e. from lowest to highest) to minimise use of animals if one of the lower doses proves effective.

8 Monitoring & documenting the animals

The monitoring of research animals, both in terms of who does it and how it is achieved, is an issue that continually arises in AEC meetings.
On the question of responsibility, the NAEAC "Good Practice Guide *for the Use of Animals in Research, Testing and Teaching*" is clear. It stipulates that, once animals have been allocated to a project, "*the Responsible Investigators have direct and ultimate responsibility for all matters related to the welfare of the animals under their control, including the general husbandry and housing of those animals as well as the specific manipulations".*
Applications must clearly indicate those investigators who have primary responsibility for monitoring animals allocated to the project – including after hours and at weekends.

When explaining the monitoring regime, applications should be realistic about what can be achieved by specific individuals. Animal facility staff may assist in this role, but should not be made responsible for monitoring animals that have been allocated to a project.

In broad terms, research animals must be monitored at least daily, with the precise frequency varying according to type of animal, their circumstances, and the nature and invasiveness of the procedures to which they are subjected.
For instance, there is a need for researchers to distinguish between monitoring requirements during and immediately after a procedure and quieter periods between experimental phases.

The monitoring of animals in field activity raises its own set of unique considerations. Field procedures that require monitoring can include trapping, handling, marking and re-release.

Monitoring checklists are mandatory elements of an animal ethics application and enable the identification of all individual animals in terms of the procedures they have undergone, when these occurred and the condition of the animal.
The checklist prevents inappropriate re-use of animals and ensures sufficient rest periods, while allowing researchers to establish signs of discomfort, distress and deterioration in animals, and apply criteria for euthanasia where applicable (humane end points).
Checklists should also make reference to the frequency of monitoring.
Monitoring checklists need to be kept near animals are housed, and must be readily available to all responsible personnel, including facility technicians and the Animal Welfare Officer.
Templates of monitoring checklists are available on the Animal Ethics Website, and these should be adapted to the specifics of individual projects. Too frequently, AECs receive non-customised templates, which are not fit for purpose.
The Animal Welfare Officer is available to advise on all issues relating to monitoring arrangements and documentation.
Signs of pain or discomfort and humane end points that are specified on the monitoring sheet should be consistent with those described in the text of the application.

9 Getting surgery and pain management right

Where a project involves surgery on animals, the application must provide precise details of the surgical procedures including description of incision sites and wound closure techniques.
For researchers inexperienced in basic surgery, a training module (Module 3: Asepsis and Basic Surgical Techniques) is available free of charge. Contact the Animal Welfare Officer for more details.

Researchers must realistically indicate the expected level of pain or distress that will be experienced by animals during the project, and explain what specific signs, exhibited by the animals, will characterise this at various levels. This assessment must be based on the assumption that animals experience pain in a manner similar to humans, unless there is evidence to the contrary.

Researchers should not intentionally understate the level of pain experienced.

The AEC will be alert to unreasonable exposure of animals to pain, and will expect researchers to include measures to reduce such exposure, both in terms of time and level.

Pain management regimes may be drug-based (analgesia/anaesthesia), or involve simple pain minimisation strategies, such as the rotation of injection sites for frequent drug administration.

Where anaesthesia is used during procedures, some indication will be expected of how the depth of it is monitored. Where post-operative analgesia is required, the researcher should explain how and when it will be used.

The Animal Welfare Officer is available for advice on issues such as which anaesthetic, analgesic or sedative is appropriate for a particular species and procedure.

10 Making the endpoints clear

The fate of all animals must be clearly rationalised within the application, with a specific, subjective and scientifically validated experimental endpoint.

If animals are to be killed, the time-points and methodology for doing so should accord with best practice, and should be unambiguous and reconciled throughout the application.

If there is any doubt about these issues, the Animal Welfare Officer should be consulted.

Where appropriate, the monitoring checklist needs to include objective signs or criteria that must be followed by euthanasia.

Higher than expected mortality rates will be questioned by AECs, as death by natural causes rarely occurs without suffering.

Unless specific Ministerial permission has been gained, researchers must always avoid “death as an endpoint” methodology, where death is the deliberate measure for evaluation and where the researcher will not intervene to kill the animal humanely.

Reference

1. The National Animal Ethics Advisory Committee, “Good Practice Guide for the Use of Animals in Research, Testing and Teaching”.

Appendix 1.

The principal criteria that the AEC is required to consider in evaluating an application (abstracted from S100 of the Animal Welfare Act, 1999) are:

- the scientific or educational objectives of the project;
- the harm to, or the distress felt by, the animals as a result of the manipulation, and the extent to which that harm or distress can be alleviated by any means (including,

where the pain or distress cannot be held within reasonable levels, the abandonment of the manipulation or the humane destruction of animals);

- whether the design of the experiment or demonstration is such that it is reasonable to expect that the objectives of the experiment or demonstration will be met; and

- the factors that have been taken into account in the choice of animal species;

- whether the number of animals to be used is the minimum necessary to ensure a meaningful interpretation of the findings and the statistical validity of the findings;

- whether adequate measures will be taken to ensure the general health and welfare of animals before, during, and after manipulation; and

- whether suitably qualified persons will be engaged in supervising and undertaking the research, testing, or teaching;

- whether any duplication of an experiment is proposed and, if so, whether any such duplication will be undertaken only if the original experiment—
  - (i) is flawed in a way that was not able to be predicted; or
  - (ii) needs to be duplicated for the purpose of confirming a result that was unexpected or has far-reaching implications;

- whether the same animals are to be used repeatedly in successive projects, and, if so, the cumulative effect of the successive projects on the welfare of the animals;

- whether there is a commitment to ensuring that findings of any experiment will be adequately used, promoted, or published;

- any other matters that the committee considers relevant.