



Alternative methods for killing laboratory animals – for careful consideration in structurally departing from the prescribed methods

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The responsible use of laboratory animals is based on the principle of the 3Rs. Yet, the guiding principle in the killing of laboratory animals is the 'R' for Refinement, aimed at alleviating distress for the animals and/or optimizing their welfare. This imposes a duty on all parties concerned to ensure they choose, substantiate and perform methods of killing laboratory animals with due care. The Dutch Experiments on Animals Act (*Wet op de dierproeven*) stipulates in Article 13c that laboratory animals should be killed by a competent person, and that this must be performed in a manner that minimizes animal pain, suffering and distress. Moreover, an appropriate method of killing must be used as specified in Directive 2010/63/EU of the European Parliament and of the Council on the protection of animals used for scientific purposes.

In July 2016, the NCad (Netherlands National Committee for the protection of animals used for scientific purposes) presented its advisory report on 'Alternative methods for killing laboratory animals' to the Dutch Minister of Agriculture, Martijn van Dam. The NCad was requested to advise on methods for killing laboratory animals that are considered to be at least as humane as the methods set out in European Directive 2010/63/EU. And to offer guidance to the Netherlands Food and Consumer Product Safety Authority (NVWA) in assessing such alternative methods of killing by providing elements that must comprise a scientific justification.

Methods

- Desk research
- Individual consultation of experts and chain partners from the Netherlands and beyond
- Enquiry of experience gained by European Members States in using divergent methods of killing
- Consultation of community groups that have an interest in animal procedures and the possibilities offered by the 3Rs (scientific institutions, umbrella and industry organisations, animal welfare organisations and anti-animal experimentation organisations). The recommendations from the organisations that were present during this meeting are listed in the advisory report, along with whether or not the NCad included these in its opinion.

Scope of the advice by the NCad

The Directive provides two possibilities for deviating from the prescribed methods of killing:

1. The purpose of the procedure cannot be achieved by the use of a method of killing set out in the Directive. The Central Authority for Scientific Procedures on Animals (CCD) can, on the basis of a scientific justification submitted by the applicant, decide to grant a project licence for a project in which a different method of killing is proposed than those set out in the Directive. The acceptance of such 'divergent' methods of killing is limited to the specific research project for which the licence is granted.
2. The other method of killing is considered to be at least as humane as the appropriate methods set out in the Directive. On behalf of the Minister, the NVWA can, on the basis of a scientific justification submitted by the applicant, grant the establishment licensee an exemption or dispensation for a structural (i.e. outside-the-project) use of the alternative method of killing. While the advisory report by the NCad focuses on the second option, it may also offer guidance for the CCD, as, if a researcher opts for a divergent method of killing for scientific reasons, the CCD will review whether that method is also acceptable from an animal welfare perspective.

Two key elements

For the purpose of assessing whether an alternative method of killing is at least as humane with regard to the individual animal as the current legally permitted methods, the NCad advises using the following elements:

1. Speed of loss of consciousness;
2. Degree of pain, suffering and distress associated with (the entire experience relating to) the killing. If it is intended to be used for groups of animals, the method of killing should be assessed on the basis of the individual animal within that group with the highest expected degree of pain, suffering and distress.



How to assess whether the alternative method of killing is at least as humane as the prescribed method

The NCad recommends performing the assessment of the alternative method of killing in the following way. Each step has been substantiated in the full report.

1. The applicant for an exemption or dispensation submits to the NVWA, on the basis of a Synthesis of Evidence evaluation, data (also from the literature) demonstrating that with regard to the two elements stated above, the method is at least as humane as the current prescribed methods. This analysis should be based on relevant (or as relevant as possible) measurable parameters for and clinical observations (such as regarding behaviour) of the animals to which the application relates.
2. Experts can compare those data with the available data for the prescribed methods of killing.
3. If there are no data in the literature or a Synthesis of Evidence evaluation provides insufficient clarification for an assessment of the request for an exemption or dispensation, exploratory animal studies should be carried out in consultation with the NVWA (and after a project licence has been granted by the CCD), to add the missing data on the parameters relevant to welfare. The study (including 'negative' results) is required to be published in an open access, peer-reviewed scientific journal, in accordance with the ARRIVE Guidelines.
4. If the NVWA assesses favorably the data in the literature and a possible exploratory study, the NVWA can grant a dispensation for a defined period.
5. The dispensation is granted subject to the condition that the applicant must first arrange for a scaled-up field trial to be conducted to ascertain the functionality of the alternative method of killing under the conditions that apply in practice (validate).
6. As soon as the alternative method has been demonstrated to be at least as humane as the appropriate methods set out in the Directive, the NVWA should issue a generally applicable exemption for it.

Further recommendations

- The NCad recommends making centrally available the conditions for dispensation applied by the NVWA and data on the exemptions granted for alternative methods of killing.
- Knowledge sharing between the NVWA and CCD must be promoted, as well as between Animal Welfare Bodies (iVdS).
- And licensees should be aware of their obligation to have professionally competent employees.
- Directive 2010/63/EU is planned by the European Commission to be evaluated shortly. The NCad recommends the Minister to advocate that the degree of scientific justification of the methods of killing currently prescribed in the Directive should be addressed during that evaluation. As well as an evaluation of the degree to which the package of permitted methods of killing is adequate for the ways in which laboratory animals are currently used in practice.

Follow-up

The minister of Agriculture has embraced the opinion of the NCad. The NVWA has implemented the recommended method for the assessment of applications for exemption or dispensation for alternative methods of killing laboratory animals.

The full report is available on the NCad website:

<https://english.ncadierproevenbeleid.nl/advice/documents/reports/16/9/15/ncad-opinion-on-alternative-killing-methods-for-laboratory-animals>



Picture by Michael Forster Rothbart, University of Wisconsin-Madison

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About the NCad

In 2014, The Netherlands National Committee for the protection of animals used for scientific purposes (NCad) was appointed by the Minister of Agriculture for the protection of animals used for scientific and educational purposes. NCad aims to make a significant contribution to minimizing laboratory animal use, both at national and international level. This will involve giving (policy) advice, exchanging knowledge, and developing both national and international networks. The ethical review of animal procedures is of pivotal importance in this regard, as are the 3Rs (Replacement, Reduction and Refinement).