



Genetically modified animals killed in stock

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The advisory report 'Genetically modified animals killed in stock' was drawn up by the Netherlands National Committee for the protection of animals used for scientific purposes at the request of the Minister for Agriculture. The substantial increase of animals killed in stock is primarily due to experiments with zebrafish and mice. The main reason for killing these animals is that they have an unsuitable genetic composition. Other reasons include age, weight, or incorrect gender for the research purposes. The NCad was asked to focus its advice on:

- Reducing the number of genetically modified (GM) animals that 'died or killed in stock', especially fish and mice.
- Other aspects relevant to the dynamics of the numbers and species of GM animals used.
- A broader perspective on the issue of the number of animals killed in stock (approximately 25% of the animals killed before the procedure are non-genetically modified animals).

Methods

- Desk research of existing reports and recommendations, partly from previous initiatives by the Ministry of Economic Affairs
- Individual consultation of experts and chain partners from the Netherlands and beyond
- 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.

Approximately 25% of the animals killed before the procedure are non-genetically modified animals; mainly zebrafish and mice. Main reason for killing these animals:

- Unsuitable genetic composition
- Age
- Weight
- Incorrect gender for research purpose

'Genome editing' is an innovative technology to create genetically modified animals. Will this increase or decrease the number of animals killed in stock?



Recommendations

Reduction of the number of GM animals that 'died or killed in stock' by:

- Quality criteria
 - Provide a further boost to the virtual centralisation between licenced establishments and promote such cooperation through the research agenda to avoid duplications
 - Oblige every licenced establishment where GM animals are bred to appoint one or more suitably qualified breeding coordinators
 - Formulate a compulsory training module that is tailored to the post in question
- Efficiency criteria
 - Ask research groups or facilities to submit a report in which the expected reduction of laboratory animals is substantiated on the basis of national and international empirical evidence. And indicate the maximum number of laboratory animals that may be used for a single genome-editing experiment, to generate a required animal model
 - Only permit the generation and breeding of GM lines if the licenced establishment has access to a state-of-the-art programme for the cryogenic storage of embryos and/or sperm, and for the revitalization of frozen material
 - During the assessment and ethical review of project licences by the Central Authority for Scientific Procedures on Animals, instruct to routinely take into account whether, in the project application, the researcher in question has clearly shown that he/she has fully explored the aspect of animals that "died or were killed before being used in breeding programmes or animal procedures" and has demonstrated that he/she has kept the number of animals used to a minimum.

However:

- Genome-editing technology makes it possible to generate GM animals from other, "higher" species
- And thus, laboratory animal use may rise

Follow-up

The minister of Agriculture has embraced the opinion of the NCad. As a follow-up, the NCad has been commissioned to draft additional quality criteria for the generation of genetically modified animals, in cooperation with expert institutes. Furthermore, these institutes will define the maximum number of animals that should be allowed to be used for the generation of an animal model in a 'genome editing' procedure. This report will be published on the NCad website shortly.

The full report is available on the NCad website:

<https://www.ncadierproevenbeleid.nl/documenten/rapport/2015/11/26/advise-stock-animals>



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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).