Animal testing:

2015 annual report

The University of Groningen and the University Medical Center Groningen (UMCG) conduct tests on animals for research and educational purposes, because some important and relevant questions cannot be answered without the use of laboratory animals.

We have a transparent animal testing policy and we openly describe how our animal experiments are carried out and how we justify these on our website. We want to contribute to the public debate on animal testing so that everyone will be able to form a well-considered opinion on this subject.

Animal research legislation: the revised law

The protection of laboratory animal welfare is effectively organized in Dutch law. The Animal Experiments Act came into effect in 1977. The Act imposes strict requirements on animal experiments based on the 'No, unless' principle: animal experiments are only allowed if there are no alternatives. There has been a strong reduction in the number of animal experiments since the introduction of this Act. The original Animal Experiments Act was revised on 18 December 2014. The revised act has consequences for the way animal experiments are organized and assessed and upholds the requirement that animal experiments may only be conducted if there are no other options.

Why has the Animal Experiments Act been revised?

There were major differences between the animal research regulations of the various members of the European Union. Not all member states maintained the same, high standards applied in countries like the Netherlands. The European Commission drafted a directive to rectify this situation. All member states are required to harmonize their existing animal research legislation with this directive. The Netherlands has accordingly revised the Animal Experiments Act to this end.

What has changed in practice?

The revised Act entails a number of organizational changes. 'There is a stronger distinction between implementation and assessment in the new situation,' explains the head of the Central Animal Facility (CDP), Flip Klatter. Under the old legislation, an Animal Experiments Committee (DEC) assessed the animal research licenses for the organization. In the revised Act, only a national body, the Central Animal Experiments Committee (CCD), may assess these licenses. The local DEC does retain an advisory role. Both the DEC and the CCD assess the ethical aspects of the license applications. All institutions are required to establish an Animal Welfare Committee (IvD) to ensure that experiments are carried out correctly. The IvD will be peopled by experts who will cooperate with the researcher to ensure that the animal experiment is conducted with the least possible suffering for the animal. Alongside the organizational changes, the definition of an animal experiment has also been changed.

2015: transition year

'Although the revised Animal Experiments Act only came into force in late 2015, the University of Groningen and the UMCG implemented much of the new legislation earlier,' explains laboratory animal expert Catriene Thuring. For example, the IvDs were established in 2013 in anticipation of the legislation. But Flip Klatter says that 2015 is still a real transition year. 'The license applications and the way they are assessed is changing and we all need to get used to the new system. In 2016 we will find out what effects these changes will have in practice. I believe the procedures will be more efficient and possibly also faster than with the old legislation.'

Animal testing in figures

In 2015 the University of Groningen and the UMCG performed 20,932 animal experiments, an decrease of 5,154 experiments in relation to 2014. The number of animal experiments fluctuates annually based on the available budgets and research capacity. The most used animals were mice, rats and birds. In these figures, an animal experiment is the sum of the procedures conducted on a single animal. An animal experiment is only included in this overview after it has been completed.

Total: 20.932

Why do we use animals in experiments?

Healthy ageing and a sustainable society are policy spearheads of the University of Groningen and the UMCG. Many of our research programmes focus on themes such as Alzheimer's disease, diabetes and Parkinson's disease, and sometimes this research requires animal testing. But experiments involving animals are also required to solve ecological puzzles, such as the migratory behaviour of birds.

The University of Groningen and the UMCG want their fundamental and applied research programmes to compete with the best in the world. Where these programmes require animal testing, we want this to be done as ethically and effectively as possible: this entails providing maximum care for and guarantees of the welfare of the laboratory animals and optimum facilities for the animal experimenters.

Of the animal experiments we conduct, 61% are conducted at the UMCG and 39% at the University's Faculty of Mathematics and Natural Sciences (FMNS). These organizations accommodate a number of research institutes where most of the animal experiments are carried out:

- Behavioural and Cognitive Neurosciences (CBN/BCN-BRAIN)
  Fundamental and applied research on the functioning of the brain, central nervous system abnormalities in patients with neurological and psychological disorders, and the mechanisms that determine behaviour.
- Centre for Ecological and Evolutionary Studies (CEES)
  Fundamental research on areas including animal behaviour and ecophysiology.
- Groningen Research Institute of Pharmacy (GRIP)
  Fundamental and applied research on drugs.
- Groningen University Institute for Drug Exploration (GUIDE)
  Lead development and the development of new drugs.
- Health Research and Epidemiology (SHARE)
  Fundamental and applied research into the factors that enable healthy ageing.
- European Research Insitute for the biology of ageing (ERIBA)
  Fundamental research on the factors that cause ageing.
- Biomaterials (W.J.Kolff Institute)
  Applied research on biomaterials and implants.
- Fundamental, Clinical and Translational Cancer Research (Cancer Research Center Groningen)
  Fundamental and applied research on oncology and tumour development.

The research examples in this annual report are illustrative of the research conducted at the University of Groningen and the UMCG. The University website contains an overview of the departments where animal experiments are conducted.

The University and the UMCG confer with various stakeholders to discuss the theme of animal testing. For example, they are participating in the working group on Transparency and Accountability together with Stichting Proefdiervrij (an anti-animal testing lobby), Wageningen University and Research Centre, Radboud University Medical Center, Utrecht University and University Medical Center Utrecht. This working group aims to establish a transparent and uniform annual reporting system. University animal testing experts and the head of CDP are also participating in talks at the Ministry of Economic Affairs, which is responsible for the animal testing portfolio, on the introduction of the new Experiments on Animals Act (WOD).

Legislation and regulations

Animal testing is bound by strict legislation and regulations. The welfare of experimental animals in the Netherlands has been protected in the WOD since 1977. In addition to this Act, the Experiments on Animals Decree came into force in 1985. The starting point of the Act is the 'No, unless' principle: animal testing is prohibited, unless there are no alternatives. If, for example, the research can also be conducted with a computer model or cadavers, then animal testing is prohibited. In 2014, a revised WOD came into force.

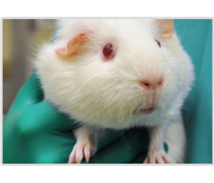
An animal experiment is defined as the sum of procedures performed on a live vertebrate whereby the animal suffers or there is a risk of the animal suffering. Experiments on invertebrates such as worms, snails and insects are not considered animal experiments. The WOD was drawn up to protect laboratory animals in the Netherlands. The WOD stipulates that only qualified persons may use laboratory animals and only within institutes that are licensed to conduct experiments on animals.

Codes of Practice

The legislation and regulations provide frameworks, but not details, so there is sometimes uncertainty about the exact interpretation. Laboratory animal experts have established Codes of Practice on a number of themes, namely animal testing in cancer research (1999), immunization of laboratory animals (2000) and welfare monitoring of laboratory animals (2001). All persons working with laboratory animals must comply with these codes.

In addition, the Animal Experiments Committee (DEC) of the University has drafted three documents with internal guidelines to facilitate standardization. The documents present the committee's position on the codes of discomfort, the choice of animal species and ethical considerations.

Revised Animal Experiments Act



On 18 December 2014, the Animal Experiments Act was revised to comply with the new European directive. An important change is that institutions now combine their knowledge of animal welfare in an Animal Welfare Committee (IvD). The IvD assesses the animal welfare aspects of a research project after it has been approved by the DEC and CCD. The IvD also advises the researcher on animal welfare issues and the application of the 3R principle. The IvD members are a laboratory animal expert, the animal facility Location Supervisor, a scientist and if necessary an external expert such as a radiation expert or biological safety officer. Alongside the organizational changes, the definition of an animal experiment has also been changed.

New role for the DEC

The changes to the Animal Experiments Act also entail changes for the role of the DEC. The DEC is no longer authorized to grant or extend licenses for animal experiments. This committee will now focus on assessing applications and advising the CCD on these. This national committee makes the definitive decision to grant or reject the project license for the experiment. The CCD publishes non-technical summaries of the licenses it has granted on its website.

Another national committee has been established called the National Advisory Committee for Animal Research Policy (NCad). NCad's role is to bring about improvements in the application of the 3R principle (Replace, Reduce and Refine) and the ethical assessment thereof in scientific and applied research and education in order to minimize the use of laboratory animals both nationally and internationally.

Ethical assessment

Animal testing leads to an ethical dilemma: does the research or educational benefit justify the suffering of the laboratory animals? An impartial Animal Experiments Committee (DEC) assesses research proposals against the legislation and regulations and weighs the benefits of the animal experiment against the suffering that this causes the animals. The starting point here is that every animal has an intrinsic value. The DEC also takes into account the psychological complexity of laboratory animals and the emotional worth and status accorded to the various species by society.

The DEC is an impartial committee that assesses animal testing by the University and the UMCG. The members of the DEC are experts in the fields of laboratory animals and their protection, animal testing, alternatives to animal testing and ethical assessments.

The DEC assesses each new research proposal against the existing legislation and regulations. It also weighs the benefits of an animal experiment against the suffering caused to the laboratory animals. The DEC also sets down requirements for the preparation of research and the expertise and training of the researchers.

The intrinsic value of every animal forms the starting point for the decision-making on whether or not an animal experiment is ethically acceptable, although other considerations also play a role, such as the psychological complexity of an animal (e.g. apes), or the social status accorded an animal on the basis of factors such as emotional relationships (dogs and cats), historic values (farm animals) or social relationships (seals).

The University and the UMCG do not have facilities for testing apes and the University has drafted a separate position on these mammals.

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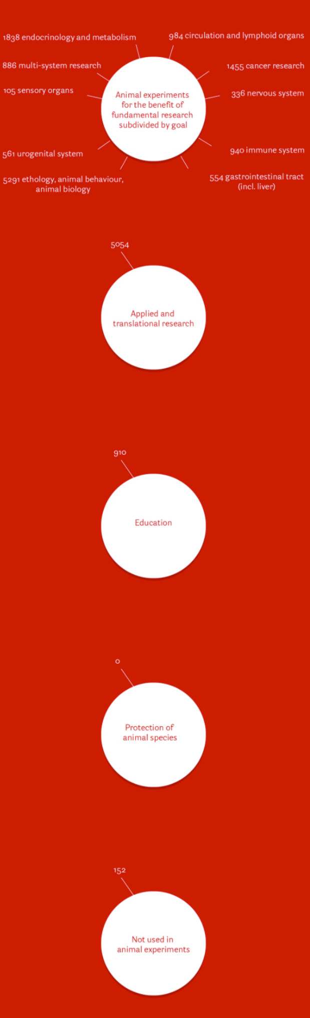
Aims of animal experiments

By far the most animal experiments were carried out to help answer a scientific question. The figure below indicates what these questions entailed. In addition to answering scientific questions, animal experiments were also conducted within the scope of teaching and training, involving, for example, students and animal technicians.



Animal suffering

Laboratory animals always suffer a certain degree of discomfort. The Dutch government describes four categories of animal suffering. Suffering does not necessarily entail pain: stress and anxiety are also forms of suffering. The figure displays the degree of suffering caused by animal tests in 2014. In 18% of the animal experiments the laboratory animal was euthanized without any prior procedures being performed on them. These animals fall under the the lowest category of suffering.

48%	21%	24%	6%	1%	0%
Mild discomfort	Mild to moderate discomfort	Moderate discomfort	Moderate to substantial discomfort	Substantial discomfort	More than substantial discomfort

Animal testing objectives

The vast majority of animal experiments are conducted in order to answer a scientific question. The figure on the right provides an overview of the scientific research that involved animal testing. Alongside scientific questions, animal experiments were also conducted for educational and training purposes, for example in order to train students and biotechnicians.

Wild cats on Schiermonnikoog

The University of Groningen has not conducted experiments on cats for a long time, but in 2015 they studied ten wild cats on the island of Schiermonnikoog. Wild cats cause problems for the local populations of breeding birds on the Wadden islands because these islands have no natural ground-dwelling predators.

In the research on Schiermonnikoog, scientists studied the effect these cats have on bird populations by establishing the cats' activity patterns using GPS collars. The cats were caught with cage traps and sedated for a brief period so that the transmitters could be fitted. After biometric data had been collected and the sedative had completely worn off, the cats were released in the same place where they had been caught. The cats were recaptured at the end of the observation period to remove the collar. The suffering of the ten cats was assessed as moderate.

Breeding efficiency

The University and the UMCG breed animals, in particular transgenic and normal mice and rats. Not all animals produced by the breeding programme are used in experiments: a large number are euthanized prematurely, for example because they lack the right characteristics or are only required for breeding. In 2015, 51,993 animals were bred, of which 36,632, some 70%, were not used in experiments. These animals are called 'surplus animals' or 'breeding surplus'. Institutes and governments in the Netherlands and abroad recognize that the large numbers of surplus animals are a cause for concern. The University and the UMCG are at the forefront of efforts to increase breeding efficiency by means of improving communication between researchers and animal carers (supply and demand) and by reducing the breeding surplus by developing the technique of cryopreservation.

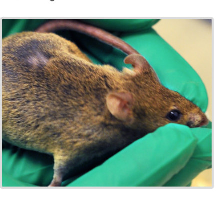
Unfortunately, some degree of breeding surplus will always be unavoidable. Animals used in experiments typically have to be as identical as possible in order to produce reliable research results. For example, they will need to be the same age and sex or have been born under identical conditions. Some animals will not have the required genetic characteristics. In one experiment for example, some 170 mice needed to be bred in order to obtain a population of 60 identical transgenic animals: you can read more about this experiment on the website of Stichting Informatie Dierproeven (a Dutch language website with information about animal testing). A significant proportion of the breeding programme is required in order to maintain unique or valuable breeding lines.

However, it is unacceptable to breed large amounts of animals that are subsequently not used for either research or educational purposes. The University and the UMCG therefore strive to increase breeding efficiency. We constantly and critically monitor animal numbers, strive to breed as efficiently as possible and use surplus animals for educational purposes whenever possible. We also see cryopreservation as an important technique for reducing the breeding surplus.

Cryopreservation

If a breeding line is not needed for a long period of time, then the technique of cryopreservation can be used to freeze the egg cells or sperm, rather than maintaining the line by means of live animals. If the breeding line is needed again, a fertilized egg cell is introduced into a pseudopregnant female. This means that no animals are required to maintain the line in the interim period.

However, freezing egg cells or sperm is a complicated technique. For example, many frozen embryos do not remain viable. The University of Groningen and the UMCG consider cryopreservation to be an important technique for reducing the breeding surplus and so they have been working to master this technique since 2011. The cryopreservation team followed training in the 'cryopreservation of sperm' in late 2015. This is a highly efficient method for freezing a breeding line that requires only two male mice. Not all breeding lines are suitable for cryopreservation in this manner, but it will result in a reduction in laboratory animal numbers nevertheless. Some breeding lines have also been cryopreserved by external companies. Nineteen breeding lines were frozen in 2015.

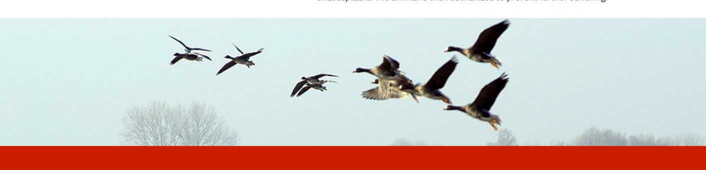


The last step of the experiment

Killing animals is part of animal testing, but this is not a step that animal carers and researchers enjoy carrying out.

Most laboratory animals are killed because the research has been competed or because the animal is surplus. The euthanasia procedure is designed to prevent animal suffering. The animals are placed in a container with a mixture of oxygen (O_2) and carbon dioxide (CO_2), in which the CO_2 concentration is gradually increased. The animals first lose consciousness and then quietly pass away.

In a limited number of cases, the animals experience complications during an experiment and may suffer more than was expected. In these cases, the researchers apply the 'humane endpoint'. They remove the animal from the experiment at the point at which the animal's suffering is deemed unacceptable. The animal is then euthanized to prevent further suffering.



3R principle

The University and the UMCG apply the '3R principle' to research and education involving laboratory animals: Replacement and Reduction of laboratory animals and Refinement of the animal experiments. In concrete terms, this entails using as few laboratory animals as possible and completely avoiding animal testing whenever possible. Where testing is necessary, we try to limit the animals' suffering as much as possible. The University's Animal Welfare Authority (IvD) helps the researchers put the 3R principle into practice.

Replacement

A researcher may only conduct an animal experiment if no other option is available. Whenever possible, we conduct our research and education activities with alternatives to laboratory animals such as invertebrates, cells, tissue, computer simulations, video training or material from the meat processing industry.

Reduction

If animal testing is necessary, we try to reduce the number of animals required by conducting experiments with the lowest possible number of laboratory animals that will still produce reliable results. This can be achieved by breeding standard lines so that the research results are more comparable or by having the researchers conduct pilots first.

In some cases, laboratory animals will be able to be used for other experiments or educational purposes following the original experiment. In 2013, 3% of laboratory animals were used for a second experiment.

Refinement

The researchers, animal carers, biotechnicians and laboratory animal experts continually work on refining their methods. Optimum housing arrangements and careful application of experimental techniques and anaesthesia limit the suffering of the laboratory animals. For example, social animals such as rats are housed in groups, which limits stress.

By refining animal experiments, the welfare of the animals is improved. This is better for the animals and better for the quality of the research.

Organization and facilities

Animal testing at the University and the UMCG is organized so as to ensure optimum animal welfare. Before a researcher can actually conduct an animal experiment, the research proposal must first be approved by an impartial Animal Experiments Committee (DEC).

The Animal Welfare Authority (IvD) can then help the researcher to prepare for the animal experiment as efficiently as possible. This involves discussing animal welfare issues and the application of the 3R principle. The University also employs two specialized veterinarians (laboratory animal experts). The laboratory animal experts monitor the welfare of the laboratory animals and sit on the IvD.

Two modern laboratory animal facilities have been established in order to guarantee optimum care of the animals and effective research using them: the Central Animal Facility (CDP) in the UMCG and the Faculty Department of Animal Care (FDD) in the Linnaeusborg.

An institute may only conduct animal experiments if it is licensed to do so by the government. The Board of the University (CvB) is the legal licensee for research and education involving laboratory animals at the University of Groningen and the UMCG. The Netherlands Food and Consumer Product Safety Authority (NVWA) monitors the licensee's compliance with the WOD.

Laboratory animal experts

The laboratory animal experts are specialized in analysing and assessing the welfare of laboratory animals. They monitor the welfare of the animals. The laboratory animal experts advise researchers on the design of their animal experiments and how they can limit the suffering of the animals.

The laboratory animal experts consult with their local and international colleagues so that they can assess whether the research proposals submitted to them are feasible and whether they can learn from other institutes when new research techniques are to be introduced.

The laboratory animal experts also advise the DEC on how to reduce laboratory animal suffering, provide training for researchers, animal carers and biotechnicians and help form policy on laboratory animal facilities. Finally, they register all animal experiments, the numbers of laboratory animals used, the degree of suffering involved and the numbers of new animals bred. The laboratory animal experts report their findings to the licensee and the NVWA annually.

Animal Experiments Committee

The University has an impartial Animal Experiments Committee (DEC) that assesses animal testing by the University and the UMCG. The members of the DEC are experts in the fields of laboratory animals and their protection, animal testing, alternatives to animal testing and ethical assessments. The DEC reports to the licensee and the NVWA annually.

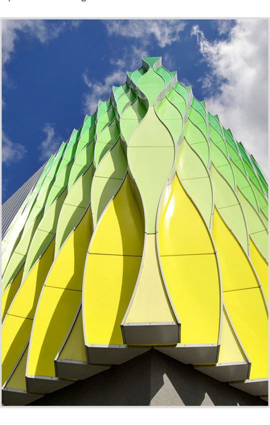
The committee is impartial: the chair and at least two of the members of this committee may not be employees of the University. At least five of the members have no involvement in animal testing. The DEC is advised by the University's laboratory animal experts.

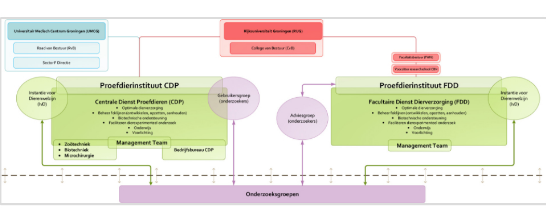
Animal Welfare Authority

The expertise on animal welfare is combined in the Animal Welfare authority (IvD). After the DEC has given its approval, the IvD helps the researcher to prepare properly for the animal experiments. They discuss animal welfare issues and the application of the 3R principle with the researcher. The IvD members are a laboratory animal expert, the animal facility Location Supervisor, a scientist and if necessary an external expert such as a radiation expert or microbiologist.

Housing

The animal experiments carried out by the University and the UMCG are conducted in the field or in laboratories with special laboratory animal facilities. We give the utmost attention to providing optimum housing for the laboratory animals, as these are the areas where the animals will spend most of their lives. This involves more than just complying with the legal requirements. The CDP and the FDD were completely renovated in 2009 and 2011 respectively and are among the most advanced facilities in Europe. The temperature, light and humidity in the animal housings can be exactly regulated. Journalists of the University newspaper reported on a visit to the CDP in 2013.

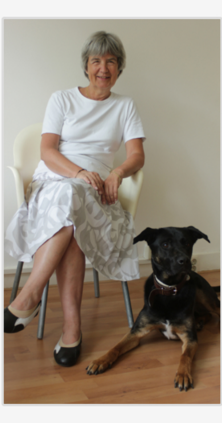




Stichting Proefdiervrij has its say

You can't polish a gem without friction

'The University of Groningen and Proefdiervrij (an anti-animal testing lobby) have been debating the use of animal testing and how to replace this practice for many years. A dialogue of this kind cannot be conducted without transparency, [...] as this dialogue is not confined to the University of Groningen and Proefdiervrij, but must reach as many people as possible with an opinion on animal testing.'



The University of Groningen and Proefdiervrij (an anti-animal testing lobby) have been debating the use of animal testing and how to replace the practice of experimenting on animals for many years. A dialogue of this kind cannot be conducted without transparency. Annuals report are a good instrument for ensuring transparency, as they force organizations to give a yearly account of all their activities. Proefdiervrij considers transparency and accountability to be an important element of the social dialogue on animal testing. This dialogue is not confined to the University of Groningen and Proefdiervrij, but must reach as many people as possible with an opinion on animal testing.

An annual report is a reasonably static document. It gives an account of the past year, and is in fact virtually a chronicle. Events taking place here, now and in the future are actually much more interesting and probably more in keeping with the things that Proefdiervrij and animal-lovers in general would like to know. So in addition to an annual report, Proefdiervrij would like to generate some kind of ongoing involvement. Tell us about the projects currently being implemented or projects that are about to start, and explain what is happening. Or is that a frightening prospect? It might take some getting used to. After all, if you tell people what you are doing and why, they will probably respond and tell you what they think. Sometimes you will disagree, but this isn't necessarily a bad thing because you will have achieved an open and honest discussion or debate. In fact, a serious disagreement can sometimes help – you can't polish a gem without friction!

At the end of the day, nobody wants to experiment on animals. I think this is something we all agree on; it's what unites us. Looking for a way towards animal-free testing and working out how long it will take are the main subjects of our ongoing discussions with the University of Groningen. And we will find a way to stop animal testing; this is not only my dream, but also my conviction. To do this, we must work alongside researchers at the University of Groningen and other establishments that conduct tests on animals. They rely on us to ask questions and make comments from an entirely new perspective, so that they can find a way to make animal testing a thing of the past.
This is why Proefdiervrij is committed to transparency, accountability and dialogue.
With kind regards,
Marja Zuidgeest
Managing Director of Proefdiervrij

About the University of Groningen

The University of Groningen is a research university with a global outlook, deeply rooted in Groningen, City of Talent. The UG is in the top 100 of several important ranking lists. It is very popular with its 30,000 students and staff (5250 FTE) from the Netherlands and abroad, who are encouraged to make the most of their abilities. Talent is nurtured, and the keyword is quality. The University is committed to actively cooperating with its partners in society, with a special focus on its research themes Healthy Ageing, Energy and Sustainable Society.

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