

Animal Research

What the statistics really mean

The annual release of the Home Office animal research statistics is an opportunity to take a snapshot of UK research and see how it is changing. We round up the key background information and trends, and what you need to know to get the most from the statistics.

What has animal research ever done for us?

Every 21st century medical breakthrough, from blood transfusions to the birth control pill, has been developed through work on animals.

Here are some examples of recent developments:

- 5 million babies have been born through *in vitro* fertilisation. Scientists developed this technique in animals and it has proved life-changing for millions of couples.
- Studies in zebrafish recently showed that a gene linked with obesity affects the cilia - tiny hairs lining the gut, opening up new avenues for treatment.
- Corneal stem cell grafts perfected in rats have been recently demonstrated to be effective in restoring human sight.
- Type-1 diabetes has been successfully treated in mice, and it is hoped that this therapy may work in humans.

What animal research isn't doing

Testing cosmetic products

This has been illegal in the UK since 1998, and is illegal in the EU. The Home Office does not licence research using animals unless it can be shown that the research will have a medical, veterinary or safety benefit.

Hurting animals unnecessarily

Every research project is assessed by the Home Office to ensure that the impact upon the animal used is as low as it possibly can be, and that animals are suitably anaesthetised or sedated.

What you can find out from the stats

The stats list "procedures" undertaken, with single animals sometimes undergoing several procedures. The minimum procedure is the use of a hypodermic needle, such as to obtain a blood sample. Approximately 3% of procedures are banded as unclassified, 36% as mild, 59% as moderate, and only 2% as substantial. They also reveal:

- How many animals of what type are used for what purpose
- Whether animals have been genetically modified - the breeding of a genetically modified animal is considered a procedure
- What place the animals came from - the majority of animals used are bred on-site, but a small percentage are imported from elsewhere in the UK or overseas.
- What type of establishments performed the most procedures. The 2010 stats showed that half of the UK's animal research happens in universities or medical schools which have to apply for funding from research councils to ensure that its research will provide maximum benefit to the public.
- You can also find out how many procedures required anaesthesia, and what system in the body was being investigated. In many studies, scientists work on many systems or on the whole body.

Want to know more?

If you would like to speak to a scientist who uses animals or an expert in any of the areas covered in this briefing, contact Chris Magee at cmagee@uar.org.uk or on 0207 685 2678



Image: istockphoto/ktsimage

What does animal research really involve?

Before any procedure can be carried out the project must be assessed by the Home Office. They consider aspects such as the medical or scientific benefits of the research and the potential impact upon the animal.

The application process for a licence is very detailed. Just filling in the paperwork for a project licence can take days, not to mention waiting for assessment from the Home Office.



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Procedures are classified as mild, moderate or substantial severity, depending on how much distress it is likely will be caused to the animal. Only 2% of all procedures are classified as substantial severity, with the rest being classified as mild or moderate.

What is a procedure?

- Imaging animals such as MRI scans
- Taking a blood sample
- Breeding genetically altered animals
- Feeding an animal a modified diet
- Removing social partners or placing animals in solitary caging
- Causing escape and avoidance reactions
- Testing devices or vaccines
- Irradiation or chemotherapy
- Immobilisation stress to induce gastric ulcers or cardiac failure in rats
- Cognitive tests eg. mazes

The 3 Rs

The '3 Rs' are the 'spirit of the law', and aim to improve animal research by:

Reducing the number of animals used in studies

Refining the use of animals in research

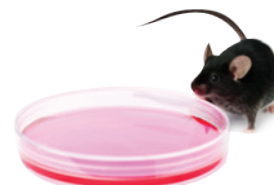
Replacing animals in research where possible

Scientists and government alike are actively trying to find new methods to accomplish this. The government have demonstrated their commitment to this agenda by establishing the National Centre for the 3 Rs (NC3Rs) to fund research to find new methods and refine current practice in animal research.

Scientists support the 3Rs and always consider how to uphold these principles when applying for a Home Office licence to conduct a research project using animals.

GM Mice

Although mice and humans may seem very different, they share many of the same genes. Furthermore, those genes often have similar functions and are in a similar order within the genome.



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Scientists have found that they are the best models of genetic diseases, and have a short gestation period, allowing inter-generational studies. As such, we have seen a steady increase in the number of procedures involving GM mice.

Creating a single strain of GM mouse can involve up to 40 different 'procedures' of breeding mouse pairs, to reach a mouse with the desired genetic traits. In 2010, about a third of the overall total procedures were simply breeding procedures.

Since the mapping of the human genome was completed in 2003, animal research has increasingly focussed on genetic experiments, while there has been a continuous decline in other types of procedure.

Fish

Researchers are increasingly using fish, particularly zebrafish, in studies to understand the fundamentals of the way our bodies work.



Image: Children's Hospital Boston

These basic studies can inspire innovative new treatments for human conditions

They are often used in studies of muscles, especially heart muscles. Zebrafish have heart muscles which regenerate, opening up a possible new route to treat heart conditions.

Scientists also recently used zebrafish to investigate an 'obesity gene' frequently found in obese adults. They found that in zebrafish, this gene was involved in the activity of the gut lining. This suggested a new way of looking at obesity which scientists are now investigating.

The see-through embryos of zebrafish are also very useful for studying human developmental disorders. Human embryos go through a stage very similar to that of fish in the first few weeks of development.

Do UK researchers use strays?



Strays are not used in research studies, as scientists normally use purpose-bred animals. This is because purpose-bred animals are more similar and have a definite breeding history, and so generate more robust science.