

Animal research in Canada - what, where and how much?

- Scientists use animals in medical, veterinary and basic research to develop treatments for humans and animals and to understand the biological processes associated with health and disease. This takes place across a range of institutions including medical and veterinary colleges, universities, teaching hospitals, pharmaceutical companies and other research facilities. This research is highly regulated with national guidelines, provincial laws as well as individual institutional policies.
- There are many comparable physiological processes in humans and animals. These similarities mean that scientists can study animals as models of human biological processes and the diseases which affect them.
- Genetically modified (GM) animals, usually mice, rats and fish, help scientists understand the function of particular genes and genetic factors that cause diseases.
- Animal research programmes benefit from a team of people, including veterinarians, animal technicians and scientists, who together manage day-to-day care and welfare needs of the animals.
- In 2016, 4,308,921 vertebrates and cephalopods were used in research at CCAC certified institutions. The most commonly used animal was fish (37%), mice (35%), cattle (12%), rats (6%) and birds (5%). Dogs, cats and non-human primates cumulatively accounted for 0.8% of animals.
 - These statistics do not include other invertebrate animals that are also extensively used in research, such as the fruit fly *Drosophila Melanogaster* and nematode worms.

Why is animal research necessary?

- Basic research aims to address fundamental biological questions about humans and animals. This contrasts with applied research, which focuses on a specific disease or treatment. These fundamental studies relating to essential structure or function accounted for 57% of animals used in Canada during 2016. Without basic research we would not have the knowledge that underpins the development of new medical and veterinary treatments.
- New medical treatments are required by law to be tested on animals before they can enter human clinical trials. Safety regulations to protect patients also require that batches of certain drugs be screened in animals.

When are animal studies allowed?

- The “3 Rs” – Replacement, Reduction and Refinement – guide the ethical use of animals in science. Researchers must *replace* animal studies with other research methods wherever possible; employ strategies that will *reduce* the number of animals as far as possible while maintaining scientific rigour; and *refine* experimental and husbandry procedures to minimize potential pain and distress for the animals.
- The Canadian Council on Animal Care (CCAC) is an independent oversight body that oversees the ethical use of animals in research. An institution's animal care and use program is certified based on institutional compliance with CCAC policy statements and guidelines. They also develop and promote training programs to ensure that all individuals involved in animal research or welfare are properly trained before being allowed to work with the animals.
- Before a project is approved it must first pass ethical review by an Institutional Animal Care Committee or “ACC.” This committee balances the harm to the animals against the potential benefits of the research and makes recommendations to improve animal welfare. The ACC’s members must include a veterinarian, a researcher, and a lay person unaffiliated with the institution.
- Better standards of welfare produce better quality research. Most improvements to animal welfare have come from within the scientific community.

Where do the scientific community and general public stand on animal research?

- Surveys consistently show the vast majority of scientists support animal research (see links below)
- In December 2013, the CCAC released poll results showing the majority of Canadians support the use of animals in medical and veterinary research, teaching and testing (see link below).

Do we need animals to develop new medical treatments?

Animal research has contributed to the overwhelming majority of medical advances, often through basic research to understand disease. Animal testing is also a crucial safety screening process in the development of new treatments. Although safety screening does not directly lead to medical advances, it has ruled out many treatments that would have posed a threat to human health. Ultimately all new medicines are approved as safe based on clinical trials in humans.

Are results of animal experiments relevant to human health?

Specific animals are chosen in experiments because they are similar to humans in a particular way, e.g., susceptibility to a certain disease. Genetically modified animals, usually mice, are bred to increase those similarities. Screening drugs in animals identifies dangerous side effects that may also harm people. At the same time, many drugs originally developed for people are then used to treat animals with conditions such as heart disease, diabetes, arthritis, and cancer.

Are animals in pain or distress?

The CCAC policy statement on the ethics of animal investigation states that animals must not be subjected to unnecessary pain or distress. The CCAC policy on the social and behavioural requirements of animals states that the environment should be appropriately enriched for the species. The experimental design must offer all animals every practicable safeguard, whether in research, in teaching or in testing procedures; cost and convenience must not take precedence over the animal's physical and mental well-being. If pain or distress is a necessary concomitant to the study, it must be minimized both in intensity and duration.

What about non-animal research methods?

Various non-animal research methods are used together with animal studies and reduce the number of animals needed. These methods include stem cells, tissue cultures and computer models. Non-animal methods account for the majority of biomedical research. Nevertheless, there are important research questions that still require animals. For example, in drug development, a large initial group of chemical candidates may be screened using non-animal methods, and only the most promising ones are taken through animal testing and human clinical trials. Before animal studies can go forward, investigators must detail how they have considered non-animal methods, and why they are not appropriate for answering their research question.

Why is there so much secrecy surrounding animal research?

Activists have claimed that the animal research visible to the public only represents a sanitized fraction of what is actually going on. While it is true that the legacy of extremism makes some researchers cautious, institutions are increasingly giving journalists access to their facilities. Pictures accompanying claims by animal activists often do not represent current research and are often decades old or from countries with significantly lower animal welfare standards.

What does the future hold for animal research?

The need for animal research changes as technology advances, new scientific questions arise, and new diseases emerge. The research community continues to find ways to reduce the potential for pain and distress in research animals; much of this work is done under the umbrella of the 3Rs – Replacement, Reduction and Refinement. New scientific methods, such as organ-on-a-chip, have the potential to reduce the numbers of animals used in certain experimental areas, however there are limits to all technologies and it is unlikely animal research will be completely replaced in the foreseeable future.

Links to further information:

Speaking of research

Many universities and research centres have developed their own websites that contain readily accessible information on the research they conduct.

The Canadian Council on Animal Care website detailing the national guidelines, policies and animal use statistics.

www.ccac.ca

Speaking of Research (SR) provides accurate scientific information on the role of animals in research in the US and beyond. It also offers extensive links to other organisations also focused on animal research.

www.speakingofresearch.com

AnimalResearch.info is a collaboration of scientists and expert contributors who provide information about the contribution of animals to scientific advances.

www.animalresearch.info

2013 National Survey by the Canadian Council on Animal Care

http://www.ccac.ca/Documents/2013_National_Survey.pdf

A 2009 poll on the views of scientists and the public on scientific issues. 93% of polled scientists supported the use of animals in research.

<http://www.people-press.org/files/legacy-pdf/528.pdf>

A 2011 poll of biomedical scientists, conducted by the journal Nature, including questions regarding whether animal research is necessary for science.

www.nature.com/news/2011/110223/full/470452a/box/1.html (Graphic summary)

www.nature.com/nature/newspdf/animal_research.xls (Data)

The Canadian Association for Laboratory Animal Science/Association Canadienne pour la Science des Animaux de Laboratoire (CALAS/ACSAL) is a national association dedicated to providing high quality training and educational resources to animal care attendants, animal health technicians, managers and veterinarian professionals across Canada who believe animal research, when necessary, must be conducted professionally, ethically and compassionately.

<http://calas-acsal.org/>