

Animal research in the U.S. - 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.
- 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 programs 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, the number of research animals covered by the Animal Welfare Act (AWA) was 820,812 animals, down over 60% from around 2.2 million in 1992. By species this is: 35% hamsters and guinea pigs, 17% rabbits, 10% farm animals, 8% primates, 7% primates, and 22% other species.
 - These numbers do not include mice, rats, birds and fish since institutions are not required to centrally report these numbers. Given that around 93-97% of research studies in most other countries involve animals not counted under the AWA, a reasonable estimate of the annual number of vertebrate animals used in U.S. research is 12 - 27 million.

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. 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 rigor; and *refine* experimental and husbandry procedures to minimize potential pain and distress for the animals.
- Biomedical research is one of the most heavily regulated industries in the US.
 - Facilities using animals covered by the Animal Welfare Act are subject to yearly unannounced inspections by the United States Department for Agriculture (USDA)
 - All government-supported research involving animals is subject to the Public Health Service policy on the Humane Care and Use of Animals.
- Before a project is approved it must first pass ethical review by an Institutional Animal Care and Use Committee or “IACUC.” This committee balances the harm to the animals against the potential benefits of the research and makes recommendations to improve animal welfare. The IACUC’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 the use of animals in research (see links below), but there has always been a small minority that is skeptical of its utility.
- Public attitudes have remained largely positive over the last decade (see links 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 Animal Welfare Act (AWA) states that “any procedure that would reasonably be expected to cause more than slight or momentary pain or distress in a human being” should also be considered a painful procedure for animals. If a procedure would cause “pain in excess of that caused by injections or other minor procedures” then the researcher must show no less-painful or non-animal alternative is available before permission to conduct the research can be granted.

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

The USDA website detailing the laws of the Animal Welfare Act.

<http://awic.nal.usda.gov/government-and-professional-resources/federal-laws/animal-welfare-act>

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 organizations also focused on animal research.

www.speakingofresearch.com

www.speakingofresearch.com/facts/statistics/

www.speakingofresearch.com/facts/research-regulation/

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

www.animalresearch.info

Public opinion on animal research over the past decade tracked by Gallup.

www.gallup.com/poll/162881/older-americans-moral-attitudes-changing.aspx

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.

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 American Association for Laboratory Animal Science (AALAS) is a membership organization for professionals with laboratory animals and provides nationally recognized certification levels for technicians and managers.

www.aalas.org

Americans for Medical Progress is a charity which aims to protect society's investment in research by nurturing public understanding of, and support for, the humane, necessary and valuable use of animals in medicine.

www.amprogress.org

The Foundation for Biomedical Research is a non-profit dedicated to improving human and animal health by promoting public understanding and support for biomedical research.

www.fbresearch.org