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Ethics and Research Classification of Animal Testing

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Short Communication

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ABOUT THE STUDY

Animal testing, also known as animal experimentation, animal research, and in vivo testing, is the use of non-human animals in experiments that seek to control the variables that affect the behavior or biological system under study. This approach can be contrasted with field studies in which animals are observed in their natural environments or habitats. Experimental research with animals is usually conducted in universities, medical schools, pharmaceutical companies, defense establishments, and commercial facilities that provide animal-testing services to the industry. The focus of animal testing varies on a continuum from pure research, focusing on developing fundamental knowledge of an organism, to applied research, which may focus on answering some questions of great practical importance, such as finding a cure for a disease. Examples of applied research include testing disease treatments, breeding, defense research, and toxicology, including cosmetics testing. In education, animal testing is sometimes a component of biology or psychology courses. The practice is regulated to varying degrees in different countries. It was estimated in 2010 that the annual use of vertebrate animals—from zebrafish to non-human primates—ranges from tens to over 100 million. In the European Union, vertebrate species represent 93% of animals used in research and 11.5 million animals were used there in 2011. By one estimate, the number of mice and rats used in the United States alone in 2001 was 80 million In 2013 it was reported that mammals (mice and rats), fish, amphibians, and reptiles together accounted for over 85% of research animals. In 2022, a law was passed in the United States that eliminated the FDA requirement that all drugs be tested on animals.

Basic or pure research investigates how organisms behave, develop, and function. Those opposed to animal testing object that pure research may have little or no practical purpose, but researchers argue that it forms the necessary basis for the development of applied research, rendering the distinction between pure and applied research—research that has a specific practical aim—unclear. Pure research uses larger numbers and a greater variety of animals than applied research. Fruit flies, nematode worms, mice and rats together account for the vast majority, though small numbers of other species are used, ranging from sea slugs through to armadillos. Examples of the types of animals and experiments used in basic research include.

Studies on embryogenesis and developmental biology. Mutants are created by adding transposons into their genomes, or specific genes are deleted by gene targeting. By studying the changes in development these changes produce, scientists aim to understand both how organisms normally develop, and what can go wrong in this process. These studies are particularly powerful since the basic controls of development, such as the homeobox genes, have similar functions in organisms as diverse as fruit flies and man.

Experiments into behavior, to understand how organisms detect and interact with each other and their environment, in which fruit flies, worms, mice, and rats are all widely used. Studies of brain function, such as memory and social behavior, often use rats and birds. For some species, behavioral research is combined with enrichment strategies for animals in captivity because it allows them to engage in a wider range of activities.

Breeding experiments to study evolution and genetics. Laboratory mice, flies, fish, and worms are inbred through many generations to create strains with defined characteristics.These provide animals of a known genetic background, an important tool for genetic analyses. Larger mammals are rarely bred specifically for such studies due to their slow rate of reproduction, though some scientists take advantage of inbred domesticated animals, such as dog or cattle breeds, for comparative purposes. Scientists studying how animals evolve use many animal species to see how variations in where and how an organism lives (their niche) produce adaptations in their physiology and morphology. As an example, sticklebacks are now being used to study how many and which types of mutations are selected to produce adaptations in animals' morphology during the evolution of new species.

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