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Animal Testing: Positive or Negative

Animal testing has always played a big part in FDA research due to the easy access and diversity of animals, but things are changing. According to the FDA, reducing animal testing will actually improve drug safety and save animals (U.S. Food and Drug Administration, 2025). While there are many positive aspects of discontinuing animal models, there are also beneficial reasons to continue them.

For instance, more breakthroughs occur through animal testing, rather than through alternative models, due to the similarity of our internal pathways. Up to 90% of our genes with mice are identical, which is primarily why they are bred for testing (Mayor, 2002). Treatment for certain diseases or disorders can be found through testing on mice because of these similarities. In addition, certain animals have a more condensed life when compared to humans, making them a key species to study during research because of the many generations produced in such a short span of time (Stanford Medicine, n.d.). Animal testing is also favored because they are living systems, as opposed to lab-grown models. In this case, animals are more accurate for performing research tests on. Lastly, researchers have the ability to control animal testing, unlike in humans or non-living systems. They may control the experiment by using a diet with strict feeding times, or a germ-free environment to ensure the testing isn't skewed (Harvard Medical School, n.d.). Animal testing plays a big role in the scientific world and will be hard to fully replace without adequate systems.

On the other hand, animal testing can be cruel and inhumane, leaving many people to question the morality of it. Animal testing can cause harm in countless ways, including suffering from isolation, administered medication, or even environmental conditions. Animals are sentient beings, meaning they can perceive things like humans, so being bred specifically for captivity and experiments is cruel. While researchers attempt to reduce the harm done, it will never fully diminish their pain (American Anti-Vivisection Society, n.d.). Secondly, while animals can be closely related to humans, their biological systems will never be completely identical to them. This is a major downside during testing because the outcomes are unpredictable when transitioning from animals to humans. For instance, during 2023, a total of 649,519 animals were reported to have been tested on (Cruelty Free International, 2025). With this in mind, the FDA stated that over 90% of drugs used in animal testing were not deemed safe or effective for human use (U.S. Food and Drug Administration, 2025, p. 1). This means a majority of those animals were unnecessarily tested on because the treatment never made it to human trial. In general, animal testing is negative because it isn't necessary for scientific discoveries. There are alternative methods like in vitro testing, which is a controlled experiment of cellular molecules in a petri dish, or 3-D printing utilized for tissues (Britannica, 2026).

In conclusion, animal testing is not a necessary process in the scientific world. The outcomes of these experiments are usually unpredictable and unusable, so there are other humane ways to go about getting the desired results. As the FDA reduces the amount of animals used in testing, it opens a door to new, improved ways of research and experimental procedures without raising ethical questions about harmfulness.

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New Approach Methods (NAMs)

New approach methodologies (NAMs) can be defined as complementary approaches to animal testing, which are becoming increasingly more popular in the scientific world (National Institutes of Health, 2025). Certain countries and organizations have begun to reduce the number of animals used during testing, simply because there are more efficient methods for research. In a study conducted by the United Kingdom, the number of animal subjects used during scientific testing fell from 4.14 million to 2.64 million in 2024 (Kwon, 2026). New approach methods, such as 3-D organoids, organs-on-chips, and generative AI systems, are more successful than animal models because they are able to replicate human biology with more accuracy. These NAMs can be classified as both *in vitro*, which is performed in a controlled environment outside of the living organism, or *in silico*, which is performed via virtual simulation (MPKB, n.d.)

To begin, some new approach methodologies, such as the creation of 3-D organoids, use induced pluripotent stem cells (iPSCs) to replicate these human systems. iPSCs are adult somatic cells that have been reprogrammed with the ability to transform into any cell type in the body through genetic engineering (Swingen et al., 2013). Organoids created through iPSCs have proven to be efficient while studying developmental stages, as well as disorders and diseases. Because iPSCs carry a genetic code that is specific to each subject, these organoids are biologically related to each subject, making testing more accurate compared to animal models (UCLA Broad Stem Cell Research, n.d.) Another similar NAM, outweighing animal testing, is microfluidic organs-on-chips. These are defined as microfluidic devices that replicate the structure and function of certain systems, like tissues or organs (Dasgupta et al., 2024). These microfluidic devices can control fluids through specific channels, accurately replicating a specialized environment for testing. In 2022, a study was conducted using a "liver-chip", where liver cells grow in small channels to identify which drugs had the ability to cause liver damage. This liver-chip identified harmful drug compounds with 87% accuracy, and in 2024, it was accepted into the FDA's ISTAND pilot program to undergo advancement (Kwon, 2026). These *in vitro* models show that new approach methodologies are more precise and humane than animal models.

Next up, computer models and AI systems are able to replace animal testing through more accurate data predictions. Computational systems are created with human data through programming, creating a compatible environment for testing (Kwon, 2026). Because animal biology is not consistent with humans, it can lead to unpredictable outcomes during and after testing. In a study from 2021, these computational models temporarily replaced conventional animal models when testing for a compound causing skin sensitivity through a virtual test, which is a necessary safety test for certain products. The outcome was successful, and the virtual method was accepted by the Organization for Economic Co-operation and Development (Kwon, 2026). Another article spoke about testing heart medication through computer models, which yielded 92% accuracy compared to 80% with animal testing (Passini et al., 2018). These *in silico* methods prove to be more precise than animal models as well.

The NAMs mentioned above have proven to be more accurate than animal testing, but they have their limitations as well. For starters, some NAMs are very costly, such as the microfluidic organ-on-chip, which can be over $1000, making them inefficient for long-term use

(Dixit, 2025). One of the major restrictions, though, is the inability to replicate complex systemic interactions due to the simplification of the models created. These interactions include multiple organs and systems, whereas NAMs can only replicate specific structural functions. For example, an organoid created from induced pluripotent stem cells (iPSCs) is isolated and therefore unable to send or receive signals without being integrated into a bigger system.

In conclusion, new approach methods like 3-D organoids and computer modeling systems are more effective at producing usable results. As NAMs progress forward and scientists continue to discover new methods, animal testing should continue to be phased out due to its unreliable and unethical practices.

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