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### Animal Testing

Animal testing has been conducted for several centuries since the ancient Greeks. During the seventeenth century, different experiments were conducted on animals, and at that time a very important debate began about whether it was ethical to do this type of experiment on animals, since at that time anesthesia did not exist; and it is still a debate in this century due to various movements against animal abuse. Animal testing has been used mainly in cosmetics and research for the development of treatments or pharmacological products. However, the main issue is whether animal testing should be continued since the purpose is medical research, or whether it is necessary to stop it as soon as possible considering the new technologies, and the suffering of the animals. Animal testing is a problem that has been present for centuries and it is something that should be banned because it is not reliable due to the fact that humans are diverse, a lot of time and money is invested in testing, there are other testing options that are much more accurate, and animal testing also interferes with an animal's normal development.

First of all, animal testing is not reliable since the body composition of animals, such as mice or chimpanzees, is different than humans, so it causes differences in the body's reactions to the use of drugs or the development of diseases. The diseases that are tried to be reproduced in animals are genetically induced, so it is not a disease that developed naturally, but is rather a simulation of a human disease. All this implies that the reactions are different between these species, so that something that affects the animal, such as medication, does not affect the human

and vice versa, which causes failures in animal testing that can be serious. This is stated by Aysha Akhtar, neurologist, member of the Oxford Centre for Animal Ethics: “The high clinical failure rate in drug development across all disease categories is based, at least in part, on the inability to adequately model human diseases in animals and the poor predictability of animal models.” As she states in this article, the high clinical failure rates are due to the fact that animals are not models similar to humans. This greatly affects the development of a drug, as errors in the models can lead to serious effects in the human testing stages. In addition, in cases where the drugs work in humans but not in animals, it delays the development process. For example, Akhtar states in her article: “*PharmaInformatic* released a report describing how several blockbuster drugs, including aripiprazole (Abilify) and esomeprazole (Nexium), showed low oral bioavailability in animals. They would likely not be available on the market today if animal tests were solely relied on.” Therefore, if only animal testing had been relied upon, the development of these medications would not have been possible. This shows us that animal testing is unreliable and can hinder the development process of medications or medical treatments.

Due to animal testing being unreliable, the money and time invested in a product could be wasted, but without testing on animals these drugs may have worked. Researchers do not usually talk about the experiments that fail, so they always highlight the ones that work, and this gives a false sense that the experiments always work. On the other hand, in most experiments the aim is to see the effects, so researchers deliberately provoke these side effects, which leads to animal suffering or death. It is mentioned in *The Guardian* newspaper article: “But flawed animal tests can exaggerate the effects of candidate drugs, and lead to trials that end up being a colossal waste of time and money, as well as suffering” (Sample). The fact that the side effects of drugs are sought after causes the impacts of the drugs to be exaggerated and results in animals constantly

suffering and dying from the research. Moreover, it means an enormous waste of time and money, since experiments are constantly being done with the purpose of failing, and if the new drug does not work, all the effort is wasted. So, it is unnecessary to spend time and money on animal testing when those sources could be used to avoid animal testing and to avoid animal suffering.

There are alternatives to animal testing that have been researched and used in recent years to avoid the use of animals in experimentation. The principle used to avoid animal testing is the 3Rs: replacing, reducing, and refining. Through this method, they can progressively eliminate or reduce animal testing. There are other alternatives to animal testing, such as software programs that help to simulate and predict the side effects of new drugs or chemicals. In addition, the use of in vitro cells and tissue cultures is another alternative that entails the development of cells outside the body in a lab setting. There is also the replacement of organisms where organisms such as lower vertebrates are used, but it is more common to use invertebrates or microorganisms, which are more ethical to test. An abstract of the *Saudi Pharmaceutical Journal* discusses this: “More efforts need to be undertaken for effective implementation of 3 Rs during laboratory use of animals ... For this integration of various computer models, bioinformatics tools, in vitro cell cultures, enzymatic screens and model organisms are necessary” (Doke and Dhawale). From this quote, we can understand that there are efficient and different alternatives to animal testing, so not doing animal testing does not mean that testing for the use of new drugs cannot be done. There are several alternatives to animal testing, so it is not necessary to use only animal testing and it is possible to reduce or eliminate it progressively.

Animals are profoundly harmed by scientific research since animal testing is intended to determine whether a drug or makeup is safe for humans, so they are exposed to toxins. This

causes their development to be hindered by testing, and sometimes they are genetically modified to develop certain types of diseases to see the effectiveness of a drug, which causes the animal to suffer unnecessarily because of the disease that was induced. In addition, animals live inside a laboratory all their lives, which affects their natural development because they are not in their habitat. This quote from *Gale Opposing Viewpoints Online Collection* states: “Scientists use animals for testing the safety of chemical products, known as toxicology testing, and for evaluating the effects of radiation and biological and chemical processes. Unlike field research, which involves observing animals in their natural habitats” (“Animal Experimentation”). The use of animals in scientific research in pharmaceuticals and makeup causes alterations in their habitat, exposure to toxins, and even genetic development, which is damaging to the natural development of animals. Animal testing causes animals to be exposed to harmful substances or situations unnecessarily to help humans, but alternatives to animal testing should be sought so this situation does not continue to be repeated.

Animal testing is something that should be eliminated, but there are different alternatives to it, which even include organisms, but they must be organisms that do not feel pain, such as certain microorganisms or fish. Key in his article states: “While mammals and birds possess the prerequisite neural architecture for phenomenal consciousness, it is concluded that fish lack these essential characteristics and hence do not feel pain.” This implies that not all animals feel pain, so it is much more ethical to test organisms that do not feel pain. Furthermore, the fact that animals are not used in testing does not mean that testing is eliminated, but that there are various alternatives for drug or makeup testing. Moreover, pain is a very complex thing to determine, so more studies are needed to conclude whether certain species feel pain. However, animals that

have been determined to feel pain should not be used for testing, and those that are known not to feel pain or are not yet proven to feel pain should be used in case it is necessary.

Much of the scientific community supports animal testing for health or science-related purposes. The main argument is that by being previously tested on animals, the effectiveness of a drug or treatment can be determined before being tested on humans and thus avoid serious effects on people. It is also argued that the animals used can simulate the effect that a drug might have on humans due to their genetic similarity. Stanford University has a section on the *Stanford Medicine* page where they justify the use of animals in scientific research, and they state that: “Animals are biologically very similar to humans. In fact, mice share more than 98% DNA with us! Animals are susceptible to many of the same health problems as humans – cancer, diabetes, heart disease, etc. With a shorter life cycle than humans, animal models can be studied throughout their whole life span and across several generations.” Through these arguments we can determine that even scientists from a very well-known institution are in favor of animal testing and use the above-mentioned arguments to support it. Although these are very solid arguments from a recognized institution, we cannot justify the use of animals to test new drugs, treatments, or even makeup, because they make animals suffer. Despite the similarities, it has been pointed out in the previous paragraphs that this type of research often delays the process of generating new treatments, and most of them do not work, or scientists purposely cause them not to work. This situation causes the suffering of the animals used for testing, since they even die because of the testing and they are kept outside of their natural habitat, which hinders their development. Therefore, the fact that animals are used for scientific testing is unethical, and scientists should use the available alternatives and investigate new ones to reduce animal testing to a minimum.

In conclusion, animal testing should be reduced or ended altogether since using species different from humans does not make the results completely reliable. Furthermore, animal testing hinders the development of new treatments and causes money and time to be spent unnecessarily. There are effective alternatives to avoid it, such as in vitro cells or software programs. Also, animal testing causes problems in the normal development and life of animals. On the other hand, there are species that do not feel pain, so they could be alternatives in case it is absolutely necessary for testing and thus not use animals that may feel pain or suffer. Several scientists argue that animal testing is necessary, but because there are new technologies and options, it is obsolete to use living animals that can suffer. Furthermore, although we are genetically similar to the animals used in studies, it does not mean that the results in animals are reliable for testing in humans. Animal testing is something that is gradually beginning to decrease thanks to various scientific research, so it is important that it is limited to the maximum to protect the animals that are being harmed.

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