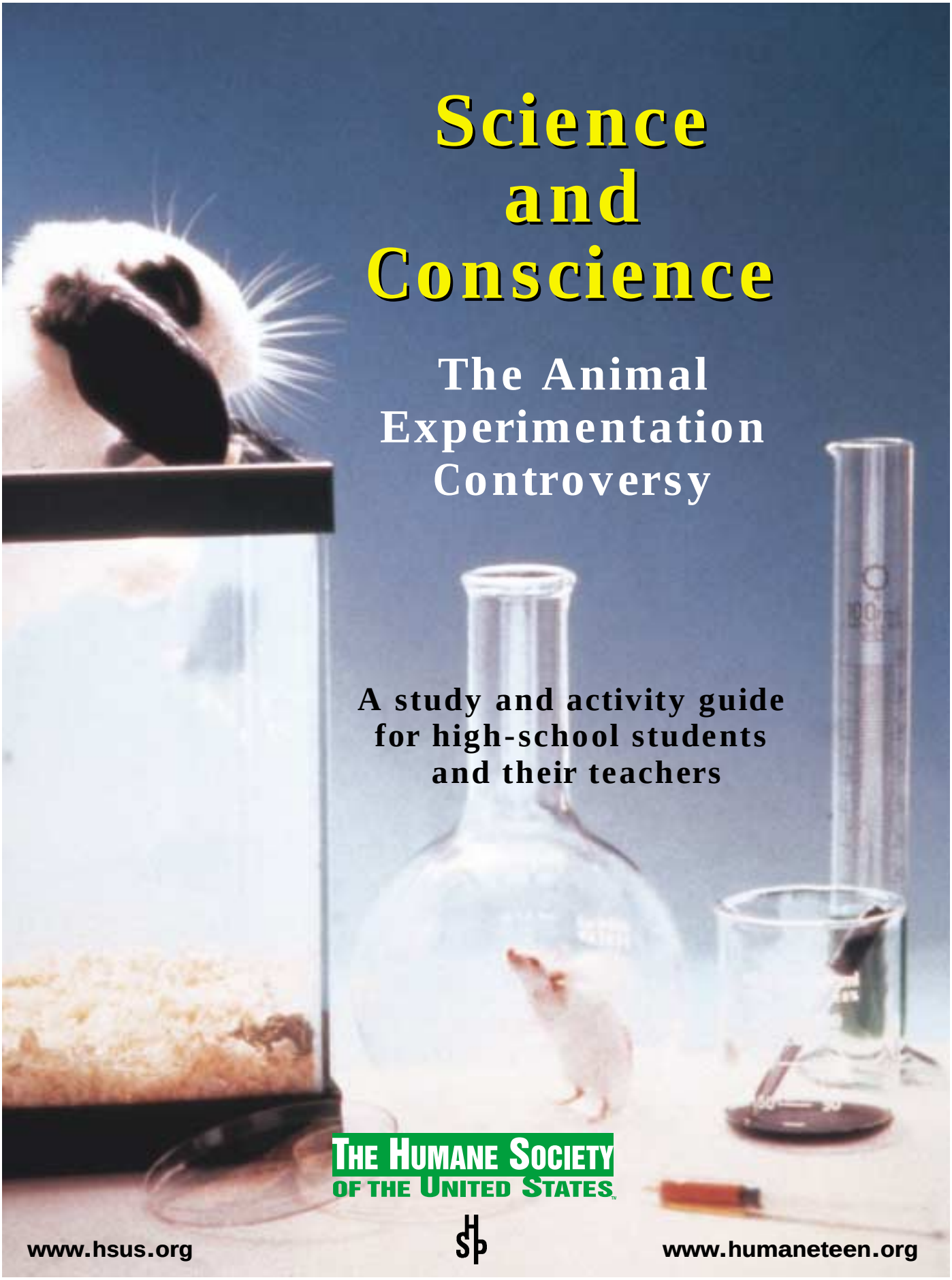

Science and Conscience

The Animal Experimentation Controversy

A study and activity guide for high-school students and their teachers

THE HUMANE SOCIETY OF THE UNITED STATES™

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Founded in 1954, The Humane Society of the United States (HSUS) is the world's largest animal protection organization. Working with concerned scientists, veterinarians, and other professionals, The HSUS helps animals through investigative means, animal protection laws, consumer campaigns, and public awareness and education.

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In addition to developing programs to protect and benefit animals, The HSUS addresses young people's concerns about animal issues. Every day, we respond to students' questions and opinions about a variety of animal-related subjects: illegal trade in wildlife, inhumane treatment of pets and farm animals, threats to endangered species, marine mammals in captivity. By far the topic that generates the most mail—and some of the most passionate commentary—is the use of animals in research and education. *What do you do to help animals in laboratories?* students write. *What can I do to help? How does your group feel about the issues?*

Your Concerns, Our Commitment

As an organization committed to the development of a more humane society, we put a high priority on addressing the use of animals in laboratories and classrooms. Lending a strong, credible voice on behalf of animals, The HSUS also supports good, high-quality science that is informed and suffused with compassion and concern for all living beings, including people.

Animal use, we acknowledge, has led to increases in human understanding of medicine, biology, and psychology. It cannot be argued, however, that modern laboratory housing or a laboratory life is a desirable place or outcome for animals. Despite the concerns of research personnel, laboratory cages are not optimal for the animals used—even for mice, whose basic needs can be relatively easily accommodated in a small space. Further, many of the techniques applied to research and testing are known to cause pain, fear, and distress in animals. Ultimately, at the end of most tests and experiments, the animals used are killed.

Our current focus, then, is promoting the development of alternatives that satisfy the same scientific and educational objectives as traditional methods using animals. Some alternatives would reduce or eliminate pain and distress in laboratory animals; some would allow researchers to minimize or replace animal use altogether. Exciting progress has already been made in this field, but much work remains to be done both within the scientific community and among the general public. A critical first step, of course, is gaining the knowledge that makes this kind of progress possible. We hope you find this booklet helpful in that regard.

How to Use This Book

Science and Conscience is divided into sections that cover several major topics within the category of animal use in research and education. Along with statistics and other relevant information, each section includes points to ponder, questions for discussion, and suggested activities. The HSUS's point of view will come through in the following pages, and we believe our arguments will be persuasive to many students. However, the values and factual claims underlying arguments in favor of or against animal research and testing can be debated endlessly. Rather than simply take our proposals—or anyone else's—as the gospel truth, we encourage you to investigate, analyze, and think for yourself about the issues.

In order to develop an informed opinion on the subject, you need to become familiar with the range of values at the heart of the matter, determine which arguments are based largely on fact and which are based on values, and then address each one appropriately. Facts should be checked and critiqued. Values need to be identified, clarified, and discussed. To that end, we've provided references to materials and organizations that do not necessarily agree with our position. We've also included information about other animal protection materials and websites as well as ways you can contact students with ideas, questions, and concerns perhaps similar to your own. For more information, please visit us at www.hsus.org and www.humaneteen.org or write to us at the address on the back of this booklet.

WHAT ARE THE ISSUES?

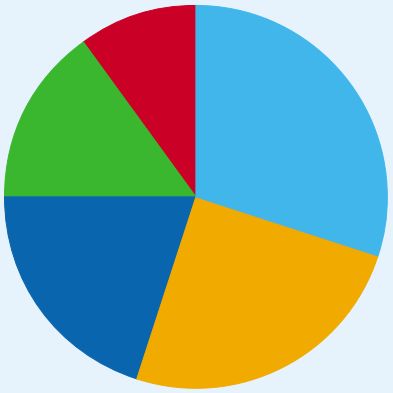
As a society, we must make choices that affect people and animals, as well as our economy and environment. Because of people's sharply conflicting beliefs, those decisions often become complicated in matters concerning health, safety, and education—and the use of animals.

Each year, millions of animals are used in schools and laboratories around the world for three broad aims: (1) to gain insights into human disease, trauma, treatments, cures, and prevention, by learning how the mind and body work; (2) to test therapeutic agents and other products and chemicals in order to assess their safety or effectiveness for humans; and (3) to educate and train students in science and medicine.

The National Science Board (NSB), a group of experts that serves as the science policy advisor to the President and Congress, regularly conducts surveys of public attitudes toward the use of animals in research. According to the NSB's 2001 survey, 44% of respondents agreed with using animals in research, 52% disagreed, and 4% were undecided. The statement to which they responded was as follows: "Scientists should be allowed to do research that causes pain and injury to animals like dogs and chimpanzees if it produces new information about health problems."

Other public opinion polls indicate widely varying levels of support depending on the types of animals and the purposes for which they are used. For example, in a 1985 poll commissioned by the National Association for Biomedical Research, 88% would accept the use of rats in research, but only 55% would accept the use of dogs. In a 1990 poll taken in Canada, 60% opposed the use of animals to test cosmetics, but only 20% opposed the use of animals to test medical products. The pie chart above illustrates the nature of animal use in laboratories and indicates some of the more specific purposes for which animals are used.

ANIMAL USE IN LABORATORIES



- BASIC AND APPLIED RESEARCH (35%)
  - ✓biomedical research, such as research into cancer and heart disease, infectious disease, and disorders of the brain and nervous system
  - ✓basic, exploratory research, namely, experiments that may have no immediate application to human problems but that add to the body of scientific knowledge
  - ✓military experiments
  - ✓agricultural experiments
  - ✓space research
- DRUG DISCOVERY AND DEVELOPMENT (20%)
- PRODUCT SAFETY AND EFFICACY (20%)
  - ✓industrial and chemical tests
  - ✓tests of cosmetics, food additives, and pharmaceuticals
- PRODUCTION OF VACCINES AND ANTIBODIES (15%)
- EDUCATION (10%)
  - ✓medical and veterinary training
  - ✓classroom dissections and live animal experiments
  - ✓school science fairs

Estimates given are approximate.

Think About It

- As a participant in the NSB's survey, would you respond in favor of, against, or undecided about the use of animals in laboratories? What factors might cause you to change your mind?
- Of the specific examples of exercises, tests, and experiments given in the pie chart, which, if any, do you think could or should eliminate the use of

animals? Which, if any, do you think should continue to involve the use of animals? Why?

Creatures Great and Small

How many animals are used in U.S. laboratories? The answer to that question is not clear. Although we know that millions of animals are used each year, the available statistics are largely unreliable and incomplete. The best source of information is the annual *Animal Welfare Report*, published by the United States Department of Agriculture (USDA). This report, however, is flawed for several reasons. First, research facilities are not required to report the number of rats, mice, birds, reptiles (such as turtles and snakes), amphibians (such as frogs) or fish that they use; therefore, the statistics for those animals can only be estimated. (Ironically, this group of animals represents at least 90% of the laboratory animal population.) In addition, laboratories owned by federal agencies are not required to report their numbers, and some institutions may not be included in the USDA's report because their reports were turned in late. In 2001, for example, 23 research facilities either failed to submit a report to the USDA or submitted it too late to be included in that year's report.

Based on the most recent *Animal Welfare Report* (2001), the graph on the right indicates some of the kinds of animals used in laboratories in the United States as well as what portion of the total laboratory animal population they represent. Not included are rats and mice, who make up the vast majority of animals used. The USDA estimates that between 10 million and 20 million rats and mice are used in research and testing. Compare that figure with a total of about 1.2 million other animals used.

Think About It

Why do we need reliable statistics on animal use in laboratories?

Are some animal species, such as rats, of less concern than others, such as chimpanzees or dogs? Why or why not?

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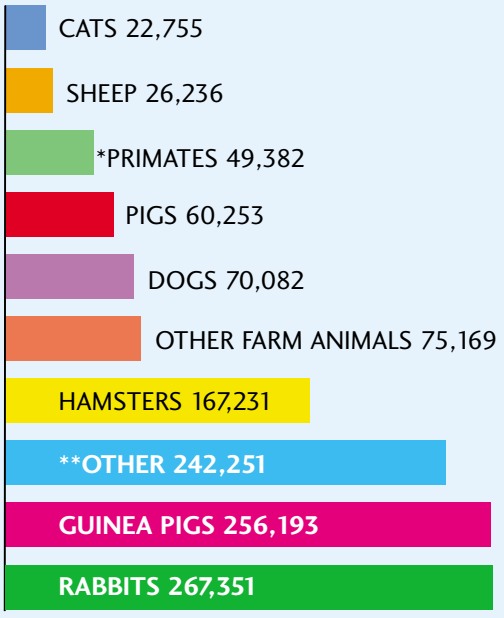
Getting to the Source

Where do animals in laboratories come from?

Animals Used in Research, Experiments, Testing, and Teaching FY 2001



*Primates are a group of animals that includes monkeys and chimpanzees.

**Included in this category are wild animals, such as bears, squirrels, and armadillos.

Source: *Animal Welfare Report*, fiscal year 2001

Most are either distributed by companies that breed and sell animals specifically for research purposes or are bred by universities and other large institutions that use them for research. (The latter is more often the case today, as researchers rely more on genetically altered mice, which are not available from commercial breeders.)

Some animals are acquired from other sources. For example, fetal pigs, which are used in dissections, are obtained from slaughterhouses. Frogs and fish are removed from their natural habitats—a practice that diminishes wild animal populations and disrupts the ecosystems that depend on them. About half of the cats and dogs used in laboratories are obtained from animal shelters, pounds, or brokers who acquire them at auctions or through "free to good home" newspaper ads.

Think About It

Each year in the U.S. alone, three to four million cats and dogs are *euthanized* (humanely put to death) in animal shelters. People who favor using

cats and dogs in laboratories say that, before putting animals to death, it makes sense to first use them in research and education. Others say that animal shelters should not be turned into laboratory supply houses. They argue that shelters were created to provide safe refuge for lost and abandoned pets and to try to place them with responsible owners or, when necessary, to humanely euthanize them. Do you think animals from shelters and pounds should be used in laboratories? Explain.

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Questions and Issues for Discussion

Using the information from the graph on page 3, create a pie chart indicating the percentage of laboratory use each group of animals accounts for. Use round numbers for percentages. Do you think these percentages were different 25 years ago? If so, for which animals? How would you explain an increase in the use of one kind of animal or a decrease in the use of another?

Explore the Issues

• Write a research paper on one of the sources, such as biological supply companies, that supplies animals to schools or laboratories. Include information on what kinds of animals are supplied and in what number. Describe how and where they are obtained and discuss any negative impacts on the animals—as well as habitats and people. Present your findings in an oral report for a class project or a club meeting.

• According to numbers reported to the USDA, a relatively small percentage of animals in laboratories—about 8.5%—experience pain or distress in experiments with no pain-relieving drugs. (That number is questioned by some critics, and it doesn't include rats, mice, or other animals.) But with millions of animals used, even a small percent amounts to a large number. Adding together the number of rats, mice, and other animals used, approximately how many animals undergo painful procedures? You may report your answer as a range of numbers, a conservative estimate, or a higher one, depending on which figure you use to represent the number of mice and rats.

Take Action

• Is your school library a good source of materials about animal protection topics? If not, ask your librarian to write to The HSUS and request free subscriptions to *Humane Activist* and *All Animals*, two publications that include updates on HSUS activities and suggestions for helping animals in need.

• Sign up to receive the free weekly electronic newsletter HUMANElines and HSUS Action Alerts, both of which provide the most current information on animal protection efforts along with ways you can help in your own community. E-mail humanelines@hsus.org.

BIOMEDICAL RESEARCH

The first recorded experiments on animals took place more than 2,000 years ago. By the late part of the nineteenth century, animal experimentation had become an established part of scientific research. Today, 50 million or more animals worldwide are used for research each year, and the U.S. accounts for public safety tests, new drug trials, and biomedical research experiments on approximately 20 million vertebrate animals.

Biomedical research develops knowledge in the natural sciences, such as biology and physiology, and investigates how this knowledge can be applied to problems in medicine. The goal is to reveal new information that could help

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in the understanding, diagnosis, prevention, and treatment of disorders, injuries, and diseases.

Think About It

Government research and development encompasses a variety of different sectors, including space research, technology, military defense, industry, and health care. Numerous factors, including domestic and international events and politics, can account for changes in the way federal money for research and development is spent. For example, after the collapse of the Soviet Union in 1991, spending on nuclear weapons programs began to decrease. What kinds of events or conditions could precipitate increased or decreased spending on medical research? Research into alternatives to animals? Other types of research?

Applied Research

Studies in immunology, infectious diseases (like hepatitis and AIDS), neurology, and chronic diseases (like cancer and heart disease) are examples of research that receives great public support. In these fields, this is especially true of applied research, which has the immediate purpose of treating illness and disease. A majority of people support research that aims, for example, to improve therapy or develop a cure for diabetes, breast cancer, or Alzheimer's disease—and most accept the use of animals in such investigations.

Basic Research

Other biomedical experiments fall under the category of basic, exploratory research, whose primary goal is to advance human knowledge. For example, a scientist may study the way a certain gene functions or investigate the complex mechanisms that control cells. Basic research seeks to produce new information about physiological problems, psychological disorders, and biological processes without necessarily having any immediate relevance or "usefulness." Like applied research, basic research includes invasive experiments that may cause pain or distress to animals. Basic research, however, is more widely criticized, apparently because the public is less willing to accept the use of animals in experiments (whether painful or not) that lack any immediate, practical benefits for humans or other animals.

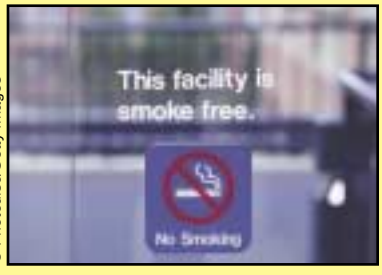
The scientific community points out that although basic research may not fulfill any specific objective, it produces data that serve as building blocks in the understanding of medical problems and the refinement of therapies and surgical techniques. Information learned from basic research into one disease—for example, how human cells are affected by a certain form of cancer—has led to significant progress in treating another, such as AIDS. One study, conducted in 1976, suggested that about 40% of the key research used in treating heart disease could be classified as basic research. On the other hand, studies of the use of published research have also indicated that about half of all research papers are rarely used by other professionals in the field.

Think About It

- Some kinds of research can be considered *both* applied and basic at the same time. For example, the great scientist Louis Pasteur wanted to solve the problems of anthrax in sheep and cattle, cholera in chickens, rabies in humans and other animals, and spoilage in milk, wine, and vinegar. In doing so, he also set out to gain a basic understanding of microbiology and disease processes. Pasteur's experiments revealed significant fundamental knowledge about bacteria, microbes, and immunity and also led to breakthroughs in the prevention and control of disease and in food preservation. This type of research, inspired both by the need to solve real problems and the desire for fundamental understanding, has been called *strategic research*. Do you think this type of research is more valid than experiments that are either purely applied or purely basic? Explain.
- Do you think there are instances where the pain or distress animals endure outweighs the scientific contribution of a research project? Why is some information considered valuable and other information useless or less valuable? How can we distinguish between the two?
- Dr. Harold Varmus, former director of the National Institutes of Health (NIH), says there is no sure way of predicting which research projects will prove consequential and which will not. Before conducting experiments that cause animals pain or distress, should researchers be asked to justify the worth of knowledge they seek? Why or

why not? How could researchers prove in advance that an experiment will be useful?

Considerable funding for biomedical research—in the billions of dollars—comes from the NIH, a government agency based in Bethesda, Maryland, that encompasses 27 institutes and employs more than 18,000 scientists. Many people feel that the NIH, which is supported by tax dollars, should invest less money in basic research and more in research directed at curing diseases. Others say educating the public about known health risks—such as smoking and alcohol abuse—represents the wisest use of taxpayers' money. Numerous diseases, after all, are preventable. An estimated 90% of cancers, for example, may be prevented by reduced stress, proper diet, and avoidance of smoking, environmental pollutants, overexposure to sunlight, and excessive consumption of alcohol. In terms of public health programs, how would you like to see taxpayers' dollars spent, and why? Despite their best efforts at prevention, many people acquire preventable illnesses or diseases for which there are no known cures. If you would spend more money on prevention, what would you say to those people?



Worst Cases

Research that generates the strongest criticism is that which people perceive as frivolous or needlessly cruel. In 1998, the public expressed concern over a series of hearing loss experiments at the University of California at San Francisco (UCSF). The experiments subjected squirrel monkeys to a six-hour surgical procedure during which electrodes were implanted in their brains. Under anesthesia, the animals were then exposed to three hours of deafening (140-decibel) sound, which has been likened to the noise level of a jet engine taking off at close range. The electrodes measured the monkeys' hearing activity.

Some scientists and physicians objected to the hearing loss experiments on several grounds. An ear, nose and throat specialist wrote that the monkeys, as a result of the research, would experience a constant loud ringing in their ears, "which will never go away, even when they try to sleep." Further, the rationale for using squirrel monkeys was questioned because they are not the usual animal models for studies of human deafness. After reviewing the research protocol for the hearing loss experiments, an assistant professor of pathology at the Medical College of Wisconsin described its "numerous omissions, scientific errors, inconsistencies, [and] misstatements." She noted, too, that it did not discuss alternative research options, such as computer simulations and available brain scans or PET scans, instead of monkeys.

The Case of Chimpanzees

In biomedical experiments, animals may be subjected to a wide variety of procedures, including those that deny them food or water, confine them to darkness, or cause them to be poisoned, burned, or addicted to drugs. At the end of an experiment, virtually all animals are killed. That has not been the case with thousands of chimpanzees used in experiments.

In the 1950s and '60s, chimpanzees caught in the wild were employed in Air Force experiments. Not long afterwards, the use of chimps in aeronautics research became obsolete. Their replacements—crash test dummies—proved less expensive to maintain, and computer sensory devices provided more detailed data that were still satisfactory for safety assessment. Ham, the original "astrochimp" who traveled in space even before Alan Shepard or John Glenn, spent most of his life afterwards caged alone in a zoo, a hardship for any social animal.

In the 1970s, chimpanzees were used in research for a hepatitis vaccine. In the midst of an emerging AIDS crisis in the next decade, chimps were again in demand. The NIH expanded a breeding program that produced hundreds of baby chim-

panzees. By the time scientists found that they are poor models for AIDS research—almost none developed the full-blown disease—there was a surplus of chimps.

How has the government handled the surplus of chimpanzees? After years of service in government laboratories, a few dozen were relocated to sanctuaries where they can socialize freely in large indoor and outdoor areas. Hundreds more were sent to the Coulston Foundation, a New Mexico research facility with a history of USDA violations. In 1998, the Center for Captive Chimpanzee Care (CCCC), in conjunction with the Doris Day Animal League, filed a lawsuit against the U.S. Air Force, which resulted in 21 of the Air Force chimpanzees being moved to CCCC. In 2002, the CCCC, a 150-acre sanctuary in St. Lucie County, Florida, purchased the collapsed Coulston Foundation, allowing for permanent retirement of 61 monkeys and 266 chimpanzees. The remaining chimpanzees are in publicly funded research facilities for which the government plans to cut financial support for the care of chimpanzees. Many of these animals are infected with hepatitis or AIDS viruses and will require special facilities to care for them.

Dr. Andrew Rowan, of The HSUS, gets a hug from Bobo, a chimp at Project Primate's sanctuary in Guinea, Africa.

The HSUS, together with animal protection organizations, research interests, and conservation groups, seeks to have the government provide funds to build and support appropriate sanctuaries for "retired" chimpanzees. The cost for such facilities and lifetime care for retired chimpanzees (chimps can live 50 or 60 years) would be as high as $100 million. Why do you suppose the divestiture of chimpanzees is of special concern and poses a greater dilemma than the disposal of other animals used in research?

Think About It

What do you think should be done with chimps who are no longer being used for research?

Questions and Issues for Discussion

Supporters of animal research often claim animals are good models for research because they possess many of the same physical and mental characteristics as humans do. Chimpanzees, for example, are intelligent, complex animals who share more than 95% of our DNA. But this raises an important ethical question: If certain animals are similar enough to humans to serve as effective research models, can we condone performing experiments on them that we would not perform on humans?

Some advocates of animal research argue that animals are different enough from humans to justify performing experiments on them. If people and animals are sufficiently different, can results of animal experiments always be applied reliably to humans?

Explore the Issues

What kinds of research projects are currently being conducted at universities, hospitals, and other institutions? Find out by searching CRISP (Computer Retrieval of Information on Scientific Projects), a database of federally funded research projects. The database, maintained by the National Institutes of Health and updated weekly, can be accessed at www.crisp.cit.nih.gov.

Take Action

The subject of research raises important ethical questions, including concerns about the use and treatment of animals. Fortunately, many of these concerns are shared by animal advocates and researchers alike—a fact that has led to some consensus and progress. Although it may not seem the case, people on different sides of the animal research issue can agree on common goals, such as minimizing animals' pain and distress.

Exchange ideas with friends and classmates about animal research and other animal protection issues. See if they are interested in learning more and doing more, as a group. For information on starting an animal protection club, order the HumaneTeen Kit, which also includes booklets on animal protection and other materials of interest to teen activists. Order your kit at www.humaneteen.org or by calling (860) 434-8666.

PRODUCT TESTING

Many procedures performed on animals are designed to test the safety of drugs, pesticides, food additives, cosmetics, industrial chemicals, and common household products. Unlike biomedical research, whose origins can be traced back thousands of years, safety testing of drugs and other chemicals used in consumer products is a relatively new practice. In fact, widespread testing of this nature has being going on for less than 60 years.

Tests are done to assess such things as general toxicity, to find out whether a chemical is safe for humans to use, or to identify the safe limits of use for hazardous chemicals. Some toxicity tests try to determine whether a substance might cause irritation to a human's eyes or skin. Others test for the potential to cause reproductive problems, birth defects, or cancer. Tests were originally developed to standardize batches of powerful vaccines and biologicals—drugs like insulin and digitalis—that varied in potency from batch to batch. Eventually, the approaches used for vaccines and biologicals were applied to chemicals and products that were thought to have resulted in human poisoning.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In 1938, Congress passed the Food, Drug and Cosmetic Act, which required the safety testing of drugs. Beginning in 1962, companies were required to test drugs to ensure not only their safety but also their effectiveness when used as directed. Today, regulatory agencies such as the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) determine how chemicals must be tested before they are used. Drugs and foodstuffs are tested most thoroughly, and the use of animals in tests of food products, pesticides, medical devices, and pharmaceuticals is required—explicitly or implicitly—by law.

Federal law does not require, on the other hand, that animals be used in tests of most personal care products, such as cosmetics. Information about eye and skin irritancy and oral toxicity is required, however, and some cosmetics manufacturers continue testing on animals. This is due in part to the fact that, until recently, the government has not established clear guidelines for the development, evaluation, and approval of alternatives.

Think About It

Why do you suppose U.S. law does not require that animals be used in most cosmetics tests? Why do you think nonanimal alternatives haven't been given higher priority by agencies that review and regulate safety testing?

Two of the most commonly used animal tests—and among those that animal protection groups find most objectionable—are the Draize and LD50 tests. Campaigns against these tests have led to major advances in alternatives research, changes in regulatory attitudes about animal testing and alternatives, and important modifications in test protocols.

Draize Tests

Draize tests measure the damage that chemicals do to the eyes and skin of animals. In the Draize Eye-Irritancy Test, which is typically performed on albino rabbits, technicians place a measured amount of a substance in one lower eyelid. (The other eye is left untreated for comparison.) They then monitor the resulting tissue damage and recovery over a seven-day period. Rabbits are restrained in stocks so that they cannot rub their eyes to clear out a substance.


USDA

Tears help wash painfully irritating substances from our eyes. Because rabbits have a weak tearing mechanism, they can't produce tears the way humans can. Rabbits also have a slower blink reflex and a thinner cornea (the transparent outer part that covers the eyeball). Those characteristics may increase the chances


USDA

that a substance will cause greater pain and damage to rabbits' eyes than to a person's. Such damage includes swelling, ulcers, bleeding, inflammation, and blindness. Several rabbits (three to six, typically) are used in each Draize Eye-Irritancy Test, and they usually receive no medicine to relieve painful symptoms. The number of rabbits used each year in this test in the United States is unknown, but one survey in 1983 estimated that more than 100,000 rabbits were used in eye irritancy tests. That number has undoubtedly declined substantially, but we do not know by how much.


USDA

In the Draize Skin-Irritancy Test, hair is shaved from an animal's side and test substances are applied to the skin, sometimes causing severe pain and abscesses. The raw skin may be covered with a patch to increase the severity of the test. This test attempts to determine whether a product will cause skin irritation in humans.

How reliable are Draize tests? Substances that irritate animals' eyes and skin don't necessarily produce the same reactions in humans, and vice versa. Several laboratories may perform the Draize test on the same chemicals, using the same animal species, and report different results. In 1971, a study of the inconsistencies in Draize test results was published. Twelve chemicals were tested by 25 laboratories, including some associated with the cosmetics industry. The various laboratories reported drastically different results, and the study recommended that the Draize test not be used as a standard procedure without substantial technician training. Even today, scoring a Draize Eye-Irritancy Test is highly subjective.

Think About It

Rabbits' eyes are generally more sensitive to irritating agents than are a human's eyes. From a scientific/regulatory standpoint, that makes rabbits good models for testing eye irritancy. It also makes them a poor choice for such tests, from an animal protection perspective. Explain.

LD50 Tests

Tests to establish whether or not a product causes eye or skin irritation generally take less than two weeks. Another short-term test is the Classic Lethal Dose 50 Percent Test (LD50). This toxicity test is supposed to define a product's "lethal dose"—the amount that kills 50 percent of animals tested. The animals used most often are mice and rats (between 40 and 200 per test substance), though birds, guinea pigs, rabbits, dogs, monkeys, and fish are also used. Test substances are administered by stomach tubes, capsules, injections, or forced inhalation; in the dermal version of the test, substances are put in contact with an animal's shaved skin for 24 hours. Reactions to the test include vomiting, diarrhea, convulsions, ruptured organs, paralysis, and bleeding from the eyes, nose, and mouth. Animals who survive are killed and examined.

Developed in the 1920s, the LD50 test is notoriously unreliable and does not provide adequate information about the poisonous dose of a substance for humans, special risks to newborns and infants, long-term effects, or the ways in which specific internal organs may be affected. In fact, all U.S. regulatory agencies have said publicly that they do not need LD50 data. Recently, the U.S. has agreed with an international proposal that the Classic LD50 test be eliminated.

When Tests Fail

Based on animal trials, pharmaceutical companies often maintain that certain drugs are safe for human consumption. Tragically, drugs may produce very different chemical reactions in the human body. After being tested on animals and proclaimed safe by its manufacturer, a medicine used to treat asthma killed thousands of people. Another, prescribed to relieve arthritis symptoms, resulted in fatal kidney damage in humans. A drug developed as a sleeping pill


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produced mental disturbances leading to hundreds of human deaths. In 1993, following a battery of animal tests, an experimental drug treatment for hepatitis B was administered to 15 human volunteers. Within months, five of the volunteers had died, and two of the survivors required emergency liver transplants.

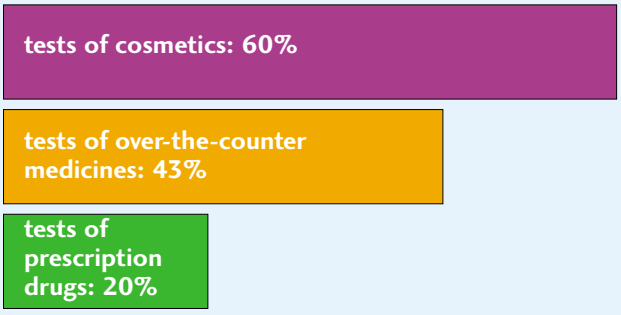
How can the examples above be used to argue successfully for an end to testing on animals? How can they be used to argue successfully for more procedures and more thorough testing on animals?

Attitudes and Arguments

It is generally recognized that animal tests aren't perfect predictors of risks to humans and that the data they produce may be interpreted incorrectly; however, they can and do identify some toxic chemicals. So, how does the public feel about the use of animals to test drugs, therapeutic agents, and other consumer products? A 1990 survey published in *Advertising Age* magazine revealed the following attitudes.

OPPOSITION TO THE USE OF ANIMALS IN PRODUCT TESTING

(1,000 American adults surveyed)



Survey 10 or more people to determine how many oppose animal testing of cosmetics; of over-the-counter medicines; of prescriptions. How do your results compare with those of the survey above?

People who support the use of animals in product testing point to the fact that it allows scientists to observe a chemical's effects on a whole biological system—something that a test on skin cell cultures alone, for example, cannot do. They also argue that test results can provide data for poison control centers and emergency room physicians in the event that a product is misused. In addition, tests are potentially valuable in a company's defense against lawsuits.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Think About It

What are some ways manufacturers could help ensure that their products don't harm consumers, thereby avoiding liability suits?


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Why do you suppose fewer Americans support the use of animals in tests of over-the-counter medicines, such as aspirin, than in tests of prescription drugs? Why do you think animal testing for cosmetics receives the least public support?

Those who criticize the continued use of animals in product testing make several arguments as well. First, toxicity and irritancy tests do not necessarily protect consumers, and knowledge of LD50 animal data is generally considered irrelevant in cases of human poisoning. An expert at the New York Poison Control Center sums it up this way: "…We either have sufficient human experience [on] which to base decisions, or in many cases, animal data have been shown not to be applicable."

Second, every type of personal care or household product—from typewriter correction fluid to shaving cream—has already been thoroughly tested on animals. But more tests may be ordered each time an ingredient is changed, sometimes so that a beauty aid can be labeled "new" or "improved." Many people feel this causes unnecessary suffering for animals, especially given that cosmetics and personal-care products tend to be nontoxic and, unlike food or prescription drugs, are not essential for human survival. Also, because other medicines may affect the outcome of a test, animals used in safety testing are usually not given

analgesics to ease their discomfort or pain.

Finally, technologically advanced tests have been developed as alternatives to the use of animals. Not many of the new tests have been validated yet, but the animal tests they are intended to replace have *never* been validated. (Validating a new method means scientists must prove it is accurate and reliable, and government agencies must officially approve it.) Toxicologists and regulators simply assumed animal tests were better than nothing—which may or may not be true.

The Corporate Response

Many consumers feel that if some companies can market safe, effective beauty and household products without testing on animals, then all companies can. In response to public concerns, manufacturers have been moving away from traditional animal tests in favor of nonanimal alternatives that make use of the latest technology. Procter & Gamble, for example, announced in June of 1999 that it would immediately stop using animal tests for its current beauty, home care, fabric, and paper products, except where such tests are required by law. This policy covers about 80% of Procter & Gamble's products—such as household cleaners, tissues and paper towels, hair-care products, and color cosmetics—and is effective in all 140 countries in which the company operates. P&G, which has spent almost $100 million on research into nonanimal alternatives, joins a growing list of leaders in the cosmetics and personal-care industries—including Colgate-Palmolive, Dial, Gillette, Avon, Revlon, and Mary Kay—that have limited or abandoned animal testing. And, of course, several companies—John Paul Mitchell Systems, The Body Shop, and Tom's of Maine, to name a few—have traditionally manufactured natural health and beauty aids and other personal-care products without *ever* testing on animals or contracting such tests out to independent research labs.

Think About It

Would you be willing to pay more for a product that has not been tested on animals? Why or why not? Would you be willing to pay more for one that has? Why or why not?

Questions and Issues for Discussion

Should manufacturers who test on animals be required to indicate that information on their product labels? Why or why not?

Explore the Issues

Write to manufacturers that test on animals. Ask why they continue to use animals and what steps, if any, they're taking to phase out animal testing.

Take Action

• Urge managers of supermarkets and pharmacies to stock products that have not been tested on animals.

• Make your own environmentally friendly household products, such as furniture polish, drain openers, and cleaners for tiles, windows, and toilets. Use natural ingredients like vinegar, water, lemon juice, baking soda, and vegetable oil. Surf the Internet for recipes or check out books on the subject. Good sources of information are university extension databases, such as that of Michigan State. Visit www.msue.msu.edu/msue/imp.

What's in a Name?

Although some companies label their finished products "cruelty free" or "not tested on animals," such labels may be misleading. Companies often test a product's ingredients on animals or use an outside laboratory to conduct the testing for them. The **Coalition for Consumer Information on Cosmetics (CCIC)** therefore has developed a logo for cosmetics companies to use on their product labels and in their advertising. This logo lets consumers know that a company has adopted CCIC's rigorous Corporate Standard of Compassion for Animals®, which means it will not conduct or commission animal tests, nor will it use any ingredient that is currently tested on animals. For a list of companies that have adopted the new standard, call 1-888-546-CCIC toll-free, write to CCIC, P.O. Box 75307, Washington, DC 20013, or visit www.leapingbunny.org.

• Set up an informational display at school on the topic of product testing on animals. Ask the manager of a health-food store to supply you with samples of cosmetics and household products that have not been tested on animals. Include information about animal testing alongside the alternative products.

• Write to The HSUS for fact sheets on animals in product testing, or research and design your own. Educate consumers about product testing by distributing fact sheets in malls or other shopping centers.

ANIMALS IN EDUCATION

Research, manufacturing, and testing firms are not the only institutions that use animals in a laboratory setting. Animals are also introduced into school laboratories and classrooms to motivate students, capture their interest, and inspire scientific observation. Indeed, using animals in education is a traditional part of many school curriculums but also one that is increasingly being questioned and reevaluated by teachers and students alike.

Teacher's Pet

One of the earliest experiences many students have with animals is caring for a classroom pet, which provides a hands-on opportunity to learn about animals' behaviors and needs. At least one recent study suggests that interaction between young students and pets in the classroom also plays a significant, positive role in children's social development, and many people believe it fosters a sense of responsibility and empathy for animals. Moreover, teachers who adopt a pet can use the experience to illustrate the important role of humane societies and animal shelters.

Given all of these advantages, why would anyone object to having a pet in the classroom? The reason, in many cases, is that the decision to get a classroom pet isn't always given adequate consideration. Because animals are living beings, caring for them properly involves a considerable investment of time and effort. When teachers and students aren't fully prepared for the challenges a classroom pet presents, problems can arise—for teachers and students as well as the animal, who may be neglected or mishandled. Following are some issues for teachers to consider before introducing a pet into their classroom.

■ Evenings, weekends, holidays, snow days, and summer vacations pose unique problems for classroom pets. Sending pets home with different students—or relinquishing them to animal shelters at the end of the school year—sends the message that animals are a part-time responsibility, not a full-time commitment. Is the teacher willing to assume full responsibility for the pet, both at school and at home?

■ Do students have the self-control and maturity to safely and humanely handle an animal?


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■ Does the classroom have an appropriate space for secure caging, away from heavy traffic areas? Will this area support housing with the correct temperature, adequate space, sunlight, shade, and a place for the animal to hide and be unobserved?

■ Is the teacher able to pay for and provide good food, blankets, toys, bowls, chewing materials, grooming equipment, and other supplies (depending on the species) for this pet? What about routine and emergency veterinary care?

■ Will the pet be given adequate opportunities for exercise, attention, and gentle handling?

■ Is the animal going to be included in the school's emergency evacuation plan?

■ Could the animal cause injury or transmit disease to a child? Will the school accept liability?

■ Are any students allergic to animals? Do any of their parents object to having an animal in the classroom?

■ Is the teacher prepared to deal with students' questions or grief if the animal becomes ill or dies?

Think About It

- What other questions might teachers (and students) want to consider before getting a classroom pet?
- What are some alternative activities or lessons that could help students appreciate and respect animals?
- Are some animals more suitable as classroom pets than others? Explain.

Chick Hatching


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Elementary and middle school teachers sometimes use chick hatching projects to teach about animal growth and development and help build students' scientific observation skills. Unfortunately, several problems can arise in chick hatching projects, in part because providing an adequate hatching environment for chicks is difficult in a classroom.

Mother hens rotate their eggs as many as 30 times a day, maintaining the proper temperature, humidity, and ventilation necessary for healthy embryo development. If the same meticulous care is not given to chick embryos in the classroom, the results can be detrimental to the animals and upsetting to students.

In classroom projects, embryos often die in their shells—or chicks emerge with deformities—because of temperature fluctuations or insufficient care. It is also not uncommon for chicks to hatch on weekends and die because the heat had been lowered in the school building, the incubator malfunctioned, or simply because nobody was present to care for them. Just as problematic is the question of what to do with surviving chicks once they are no longer wanted for educational purposes.

A potentially unsanitary and distracting presence in the classroom, adult chickens are far from ideal classroom pets. Most farmers are unwilling to take in chicks used in class projects, and chickens sent home with students are usually unwelcome. As a result, classroom-hatched chicks frequently end up at animal shelters. Because no one is able or willing to adopt them, they are usually euthanized.

Understandably, many students become upset when they learn that the animals they have spent weeks observing, caring for, and nurturing will be put to death simply because a lesson is over. The underlying message is that bringing a life into the world is not a serious, long-term responsibility and that the life of an animal is unimportant. In addition, because deformed chicks are typically disposed of early on in the lesson, students may infer that physical imperfections make a living being worthless.

Think About It

What are some of the educational goals of hatching chicks in a classroom? Can you think of other lessons or activities that accomplish those goals without resulting in the problems associated with a chick hatching project?

The Deal on Dissection

Millions of frogs, turtles, cats, mice, rats, fish, and other animals are used in school dissection exercises every year. A reasonable estimate is that annually six million vertebrate animals, and roughly the same number of invertebrates, are dissected in U.S. high schools. (Unknown numbers of animals are also used in colleges, middle schools, and elementary schools.) The most commonly dissected vertebrates are frogs, fetal pigs, and cats. Others include turtles, rats, birds, salamanders, foxes, and bats. Invertebrate animals used for dissection include grasshoppers, crayfish, earthworms, clams, and sea stars.

Most of the animals used for dissection are obtained from the wild. In just one week, a single biological supply company may capture 3,000 or more frogs for use in schools.


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Collection of animals for the biological supply trade can deplete populations of wild animals and disturb the delicate balance in their natural habitats. For example, frogs help control populations of crop-destroying insects. If significant numbers of frogs are removed from an area, insect infestations can result, leading to increased use of pesticides. A sharp decline in frog populations also affects animals who rely on frogs as a source of food. To add to the problem, chemicals such as formaldehyde (used to preserve dead animals) are hazardous to the environment and to human health.

Animals such as fetal pigs are taken from pregnant sows at slaughterhouses. Students may object to using fetal pigs or other by-products of the meat industry because of concerns over how animals raised for human consumption are treated. Almost all of the 100 million pigs killed each year for meat in U.S. slaughterhouses are crowded into confined spaces and deprived of fresh air and forage.

Think About It

Cats and dogs who are euthanized at animal shelters are sometimes transferred to educational institutions for use in dissections. Under what conditions, if any, would you condone this practice? Under what conditions, if any, would you object to it? For example, do you think animal shelters should inform pet owners about such a policy? Should shelters receive payment from schools or research institutions that accept euthanized animals? Should those animals be transferred to precollege schools or strictly to institutions of higher learning, such as medical and veterinary schools? Should animal shelters wait a reasonable amount of time before euthanizing a healthy animal and transferring the animal to a school or laboratory? If so, how long?


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Dissection, which involves cutting, drawing, labeling, and memorizing, is intended to help students learn to observe, describe, and memorize an animal's structural anatomy. Many students and teachers point out, however, that it contributes little to the understanding of biological processes and the natural world. Dissection does not necessarily challenge students to form hypotheses or collect and interpret data. It also reveals nothing that isn't already explained and illustrated in countless biology textbooks. Furthermore, published studies have shown that students who use alternatives score just as high—or higher—on anatomy tests as their classmates who dissected animals.


© J. Dommers/HSUS

Although the purpose of biology is to understand living organisms, the animals students are asked to dissect have been killed and preserved long before they reach the classroom. People argue, therefore, that dissection is incompatible with the teaching of biology. They also argue that dissection is not a cost-effective way of teaching the subject. Because an animal can be dissected only once, new specimens have to be reordered from supply companies for every class, every school year, often costing schools thousands of dollars annually. Studying living animals in their natural habitats, on the other hand, need not cost anything. In addition, it offers a genuine opportunity to participate in research and to experience the joy of discovery.


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Think About It

Those who support dissection say it is not only an effective way of teaching structural anatomy but also a means of providing hands-on experience with real animal tissue. For example, one prominent dissection proponent, writing in *The American Biology Teacher* magazine (1993), claims that neither plastic models nor videos provide the information or sensory experience that actual animal tissues and organs do. If you disagree, how would

you respond to this claim? If you agree, how would you answer the objections raised by dissection critics?

Science Fairs

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Schoolwide, regional, and national science fairs present another opportunity for students to work with animals in an educational setting. These events are often sponsored by professional associations and corporations that encourage young people to enter careers in science. A science fair project is seen as a chance for students to actively engage in the scientific method by formulating and testing hypotheses.

Unfortunately, many science fair projects have resulted in harm to animals. What's more, in several such cases, the students involved either failed to meet their basic learning objectives or simply confirmed what is already common knowledge. A participant in one science fair exposed rats to nail polish remover until they died from liver and bone marrow destruction. The student failed to recognize the physiological cause of death. In another project, middle school students fed "junk food" to a group of mice and gave another group a nutritious diet. After two weeks, they concluded, "Mice food is healthier."

One of the most notorious science fair projects was that undertaken by a student who blinded five sparrows by removing their eyeballs. Next, she withheld food and exposed them to electric shocks for six days. Her only conclusion was that, when starved to 70% of their body weight, birds are likely to die.

Projects such as these have led teachers and science fair judges to reevaluate the educational merits of having untrained students experiment on living animals. The sparrow-blinding project convinced the prestigious Westinghouse Science Talent Search to prohibit live animal experimentation. Other sponsors, however, continue to allow it.

Think About It

Should the use of animals in science fairs be banned? Should students be allowed to use animals for school projects as long as they follow guidelines regarding their use and care? If so, what would be some appropriate guidelines? Who would be responsible for making sure students follow them?

An important goal of biology is to teach appreciation for the natural world and its diversity. Many educators believe that dissecting or experimenting on animals undermines that goal by treating animals as commodities to be bought, used, and thrown away. Furthermore, school projects that harm animals may discourage bright, compassionate students from pursuing careers in science.

Think About It

How might observing animals in a natural setting produce more relevant information than a dissection exercise or a project involving animals in captivity?


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Questions and Issues for Discussion

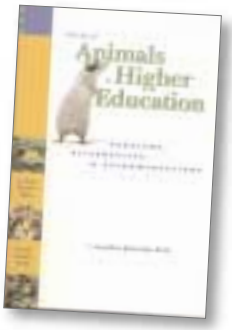
What have been your experiences with animals in a school setting? Which, if any, would you consider positive, enriching, and educational? Why? Which, if any, would you describe negatively, and why?

Explore the Issues

• Review The HSUS's "Guidelines for the Study of Animals in Elementary and Secondary School Biology," available from The HSUS Youth Education Affiliate. How do your school's policies regarding the care and use of animals compare with those guidelines? Write a proposal for incorporating some of The HSUS's guidelines into your school's policies and present it to school administrators.

• Read *The Use of Animals in Higher Education: Problems, Alternatives and Recommenda-tions*, by Dr. Jonathan Bal-combe (Washington, DC: Hu-

mane Society Press, 2000). This 104-page book studies the educational, ethical, and environmental issues surrounding animal study in classrooms. An excellent resource for science or social studies reports, the book may be downloaded at www.hsus.org.



Contact a major biological supply company in the U.S. (Your biology teacher can provide you with names and addresses.) Request a list of animals that the company supplies for dissection. Inquire into the numbers of animals they sell each year and the methods they use to obtain them. Also find out how much money your school spends each year to purchase animals for dissection. Compare that figure with the cost of a few reusable plastic models of that animal. (A broad range of models and other learning tools is available through biological supply catalogs as well as through loan programs offered by groups such as The HSUS, the National Anti-Vivisection Society, and the Ethical Science and Education Coalition.) Prepare a report that illustrates how using alternatives is more cost-effective than dissecting animals. Include a chart or graph that illustrates savings over a long term, such as three or more years.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Write to professional associations and corporations that sponsor science fairs. Ask them what guidelines they've established regarding the use of animals in science fair projects. Compare the guidelines and present your findings to your class in an oral report. Include an explanation of which guidelines you think are the best and what could be done to further improve them.

Take Action

• Copy the questions on page 12, including any you might add, and distribute them to teachers who may be considering a classroom pet. The HSUS also has an informative brochure on the subject—*Is a Classroom Pet for You?*—that you may distribute to teachers. Copies are available through The HSUS Youth Education Affiliate at www.nahee.org.

• Give a presentation on humane treatment of animals to a class of younger students.

• Submit an article or letter to your school newspaper about the drawbacks of using animals in science fairs, biology labs, and other educational settings.

• Provide local elementary-school principals, librarians, and teachers with *For the Birds! Alternatives to Replace Chick Hatching in the K-6 Classroom*. This 16-page booklet offers games, puzzles, science projects, and other educational activities that meet the traditional objectives of chick hatching. Copies are available from The HSUS Youth Education Affiliate.


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• Check out CD-ROMs and other humane alternatives to dissection and live animal experimentation, available for loan through the Humane Education Loan Program. For more information on HELP, turn to page 33.

PAIN AND DISTRESS

In *The Principles of Morals and Legislation* (1789), philosopher Jeremy Bentham argued for greater consideration in our treatment of animals, writing, "…the question is not, Can they *reason*? nor, Can they *talk*? but, Can they *suffer*?"

The controversy over animal use in research, testing, and education is most often fueled by the subject of pain and suffering, even more

Public Views on Pain and Research

Review the following results of a British public opinion poll on pain and distress in laboratory animals, published in *New Scientist*.

PERCENTAGE OF PEOPLE WHO APPROVE OF RESEARCH TO DEVELOP A DRUG FOR LEUKEMIA IN CHILDREN

	monkeys	mice
animals NOT SUBJECTED to pain, illness, or injury	75%	83%
animals SUBJECTED to pain, illness, or injury	52%	65%

PERCENTAGE OF PEOPLE WHO APPROVE OF RESEARCH TO STUDY THE SENSE OF HEARING

	monkeys	mice
animals NOT SUBJECTED to pain, illness, or injury	56%	70%
animals SUBJECTED to pain, illness, or injury	21%	36%

PERCENTAGE OF PEOPLE WHO APPROVE OF TESTS TO DETERMINE WHETHER A GARDEN INSECTICIDE WILL BE HARMFUL TO PEOPLE

	monkeys	mice
animals NOT SUBJECTED to pain, illness, or injury	43%	56%
animals SUBJECTED to pain, illness, or injury	16%	29%

Clearly, the biggest difference in public approval (roughly 30%) is for experiments that involve pain versus those that do not. For example, while more than half of the people polled would approve of using monkeys in hearing research that involved no pain, fewer than a quarter of those same people would approve if the experiments were painful. Other differences in approval rating have to do with the type of research (how necessary or beneficial it is perceived to be) and with the species of animal used. In the British poll, which of these two factors generates the greater difference in public approval?

U.S. Opinion Poll on Pain and Distress in Research

A survey conducted for The HSUS by an independent polling firm asked 757 Americans, "How strongly do you approve or disapprove of the use of animals like mammals and birds in research and testing when the animals experience severe, moderate or little or no pain or distress?" Here's what they said.

	Little or No Pain or Distress	Moderate Pain or Distress	Severe Pain or Distress
Strongly approve	30%	11%	8%
Somewhat approve	32%	32%	13%
Total approve	**62%**	**34%**	**21%**
Strongly disapprove	20%	37%	50%
Somewhat disapprove	13%	23%	18%
Total disapprove	**33%**	**60%**	**75%**

than the issue of whether animals die at the end of an experiment. Few people, including members of the scientific community, would argue against reducing or eliminating animals' pain and suffering. Still, not until the past decade did administering painkillers to rodents become accepted practice in laboratory experiments. As a point of comparison, anesthetics were rarely used twenty years ago in surgery performed on newborn infants, who, like animals, cannot verbally communicate whether or not they feel pain.

Indeed, researchers have been slow to acknowledge infants' and animals' capacity to experience pain and to take steps to minimize it. In 1987, 85% of neonatal anesthesiologists reportedly agreed that human infants could perceive pain. Yet only 5% actually gave analgesics or anesthetics during surgical procedures despite recommendations to the contrary in textbooks on pediatric anesthesiology. This practice was largely unknown to the general public—and the ethics of it not seriously discussed—until 1985, when specific cases of surgery on premature infants were publicized on television and radio and

in the print media. Several groundbreaking studies by Oxford University researcher Kanwal Anand and his colleagues were also taking place. They found that infants who underwent heart surgery were more likely to survive if given pain relief during the operation. Calling attention to the issue had a dramatic effect: By 1996, 85% of neonatal anesthesiologists were giving pain relief.

Public concern has also given rise to new practices, as well as laws and regulations, aimed at limiting or eliminating pain and distress in laboratory animals. In the mid-80s, a system of Institutional Animal Care and Use Committees (IACUCs) was established in the United States. IACUCs are charged with reducing the pain and distress that research animals may experience. Part of their job is making sure researchers have explored alternatives if their experiments are likely to cause animals pain and distress. To focus these efforts into more urgent action, The HSUS has launched a campaign to eliminate pain and distress in laboratory animals by the year 2020 and is encouraging scientists and IACUCs to adopt this goal as well.

Think About It

Why would the public support the idea of minimizing pain and distress in laboratory animals? Why would scientists support this idea?

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Understanding Pain

As part of its campaign, The HSUS believes in broadening concerns about animal pain to include a number of conditions capable of causing laboratory animals to suffer. Besides experimental or testing procedures themselves, several factors—capture, handling, transportation, housing in cages—can contribute to animals' pain and distress. In addition, painful or stress-inducing stimuli can take a variety of forms. Surgery, injury, dehydration, starvation, and disease may cause physiological stress. Psychological stressors include such environmental conditions as crowding, isolation, absence of social interaction, physical restraint, excessive noise, and the presence of people or other species.

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Animal distress that isn't necessarily the result of pain is still largely ignored or overlooked by research institutions. First, there is considerable disagreement about what causes animal distress and how distress should be measured. Further, some believe that animals are incapable of experiencing such states as anxiety, which, they argue, are uniquely human.

Think About It

What arguments do you suppose underlie the assumption that anxiety is a uniquely human state? Do you agree or disagree with those arguments? Consider other distinctions that are drawn between human and nonhuman animals: the capacity for language, culture, self-image, the ability to anticipate future events based on past experiences, and altruism (unselfish concern for the welfare of others). Recent studies and observations of whales, chimpanzees, and many other species have blurred some of the lines that distinguish animals from humans. Can you cite any examples of recent discoveries that point to similarities between people and animals? Do you think they should figure into discussions of how people use and treat other species? Why or why not?

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Coming to Terms

"Pain," "distress," "anxiety," "fear," and "suffering" are used in everyday language to describe human and animal experiences—but these terms are often confused, and people do not always agree on their meanings. Here is one set of definitions.

pain: an unpleasant sensory and emotional experience associated with actual or potential tissue damage

Reading the Signs

The effects of such anti-anxiety drugs as alcohol and barbiturates in animals are often strikingly similar to the effects in humans. Similarly, drugs that induce anxiety in humans (evidenced by increased blood pressure, hormone levels, and pulse, intense inner strain and excitation, and rocking motions) cause comparable reactions in primates: struggling in restraints, elevated blood pressure, pulse, and stress hormone levels in the bloodstream, hair standing up, and increased vocalization.

How would you define "anxiety"? Do you believe animals can experience anxiety? If so, is it the same sort of anxiety that humans experience and, further, could it be a significant cause of animal distress or suffering?

A drop or rise in an animal's activity level may indicate pain or distress. But prey species such as rabbits do not always behave differently when they are in pain, because to do so might attract a predator. And animals such as mice are typically quiet in the daytime, regardless of how they feel. How would you assess whether injecting infectious bacteria causes pain or distress in a mouse or a rabbit? What would you look for? Do you believe mice or rabbits can experience pain? Fear? Depression? If so, how would you tell?

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anxiety: an emotional state of increased alertness prompted by an unknown danger

fear: an emotional state involving increasing alertness prompted by an experienced or known danger present in the immediate environment

distress: a state caused by an organism's inability to escape from acute stressors or adapt to an altered external or internal environment

suffering: a highly unpleasant emotional response usually associated with pain or distress

Think About It

- Read the previous definitions carefully. Can you think of examples from biomedical research, testing, or educational use of animals that might cause animals to have one or more of those responses or experiences?
- Anesthetics and analgesics are used in laboratory experiments to alleviate or eliminate pain in animals. There are no similarly well-known methods to relieve distress, anxiety, or fear. In fact, most discussion about animal pain and suffering centers on pain, not anxiety or suffering. Why do you suppose that is the case?

Reporting on Pain

The USDA requires that all entities that conduct research on animals submit annual reports on their use of animals, including information on pain categories. Animals used in antibody production, cancer research, toxicology, and infectious disease research are commonly placed in Category C, which means they experience no pain (or only momentary or minor discomfort) and thus do not require pain-killers. Category D is for animals who experience pain or distress and are given pain relief, although whether the pain relief is sufficient is sometimes questioned. Animals used in painful experiments without being given pain relief are placed in Category E.

Despite the USDA's system of categorization, there are vast discrepancies in the way experiments involving pain and distress are classified and reported. Oddly, some states with substantial animal use have reported zero or less than one percent of their laboratory animals in Category E. For example, Louisiana, which in 2001 used 14,829 animals in research, reported that not a single animal was subjected to unrelieved pain and distress, whereas states with comparable animal use—such as Washington and Delaware—report thousands of animals. See the table on page 20.

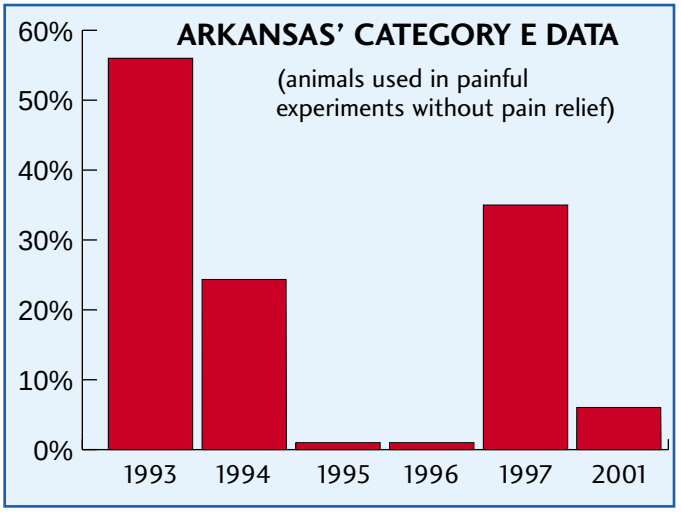
Although it is possible that variations from state to state reflect real differences in animal use, the range of percentages is most likely due to differences in reporting procedures and in the way researchers interpret "pain" and "dis-

	Total number of animals used in research	Category E (animals used in research with pain or distress; no drugs given for relief)	
Alabama	8,163	339	(4.2%)
Alaska	26	0	(0%)
Arizona	6,134	59	(1.0%)
Arkansas	2,833	192	(6.8%)
California	119,286	6,394	(5.4%)
Colorado	8,368	2,500	(3.0%)
Connecticut	7,103	834	(11.7%)
Delaware	56,778	9,359	(16.5%)
District of Columbia	1,867	0	(0%)
Florida	7,094	95	(1.3%)
Georgia	19,470	1,534	(7.9%)
Hawaii	113	0	(0%)
Idaho	889	25	(2.8%)
Illinois	39,128	1,106	(2.8%)
Indiana	23,505	6,980	(3.0%)
Iowa	58,612	14,347	(24.4%)
Kansas	19,423	0	(0%)
Kentucky	2,794	0	(0%)
Louisiana	14,289	0	(0%)
Maine	3,457	418	(12.1%)
Maryland	26,679	635	(23.8%)
Massachusetts	134,568	2.554	(1.9%)
Michigan	39,023	7,027	(18.0%)
Minnesota	16,365	176	(1.1%)
Mississippi	1,502	0	(0%)
Missouri	34,722	5,620	(16.2%)
Montana	1,981	0	(0%)
Nebraska	44,269	11,312	(25.6%)
Nevada	1,979	0	(0%)
New Hampshire	817	3	(.4%)
New Jersey	78,736	4,745	(6.0%)
New Mexico	1,159	2	(.2%)
New York	50,888	4,788	(9.4%)
North Carolina	21,289	1,541	(7.2%)
North Dakota	309	0	(0%)
Ohio	63,387	3,341	(5.3%)
Oklahoma	4,586	0	(0%)
Oregon	3,993	0	(0%)
Pennsylvania	85,356	4,571	(5.4%)
Rhode Island	1,491	91	(6.1%)
South Carolina	3,146	0	(0%)
South Dakota	5,135	447	(8.7%)
Tennessee	7,103	33	(.5%)
Texas	37,176	1,445	(3.9%)
Utah	4,686	793	(16.9%)
Vermont	1,213	48	(4.0%)
Virginia	15,129	33	(.2%)
Washington	13,380	4,024	(30%)
West Virginia	722	0	(0%)
Wisconsin	21,584	1,576	(7.3%)
Wyoming	370	0	(0%)

Source: *Animal Welfare Report*, 2001

tress”—not differences in the types of research being done or the techniques being used.

In addition, yearly fluctuations in Category E, such as those illustrated in the graph below, suggest that either some unusual experiments are being carried out or, more likely, there are inconsistencies in the way data are reported by some states’ research institutions.



If data are to be at all useful, then better reporting guidelines must be established. Clearly, there is a need to define terms such as “pain” and “distress,” as well as a need to consistently and precisely discriminate between pain/distress levels: none, moderate, and severe. This would greatly help institutions standardize classification of their research and improve reporting practices.

A Plan for the Future

Understanding more about pain and distress is an important step in minimizing and eventually elimnating the suffering of laboratory animals. Thus, The HSUS encourages the private sector and government to allocate more funding for the development of accurate measures of animal distress and methods of alleviating it. In addition, we encourage research, testing, and educational institutions to adopt the following strategies:

- Use alternatives to animals whenever possible.
- Design projects in which animals have the opportunity to terminate any painful stimulus and therefore control the level of pain they experience. The International Association for the Study of Pain (IASP) has set up guidelines in which researchers are urged to design *only* such projects. Similarly, researchers can allow animals to “volunteer” for research by offering them a highly desired food or drink. Animals will accept some painful stimuli in order to gain the reward, but at their pain tolerance threshold, they can choose not to participate any further.
- Provide pain relief, whenever possible, to animals used in painful procedures.
- Exchange information so that new ideas and initiatives can be disseminated quickly. Many institutions and animal facilities have written policies on “best practices”—those that seek to minimize or prevent pain and distress in animals. These documents, however, are usually not publicized or shared with other institutions.
- Change minimum standards of animal care into optimal standards. When we keep animals for our benefit, we have a responsibility not just to reduce their pain and suffering but also to improve and enhance the conditions in which they live. Environ-mental enrichment, which includes rewarding social and physical stimuli, can prevent captive animals’ boredom, frustration, or apathy. For example, animals value the chance to engage in their natural behaviors, such as foraging for their own food rather than simply eating what is freely available.


K. Lewis/Animals Animals

Think About It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Current evidence suggests that insects probably do not experience pain. An insect’s reaction to an aversive stimulus is argued to be simply a reflex response. Where possible, should insects be used to replace mammals and other animals in painful experiments? Should invertebrate animals, such as insects, be given any moral consideration at all? Why or why not?

Questions and Issues for Discussion

Aside from the obvious moral considerations, pain and suffering can affect the outcome of a test or experiment and lead to a misinterpretation of results. This is yet another reason to encourage researchers to eliminate pain in laboratory animals. In some painful procedures, however, researchers assert that the use of painkilling drugs would interfere with results. How would you resolve this dilemma? Given this information, do you think The HSUS's goal of eliminating pain in laboratory animals by the year 2020 can be accomplished? If so, how?

Explore the Issues

How does your dictionary define the terms "pain," "anxiety," "fear," "distress," and "suffering." Are some of the definitions synonymous or circular?

Take Action

Write to animal care and use committees at local companies, universities, and research institutions. (Visit the website of the USDA's Animal and Plant Health Inspection Service, www.aphis.usda .gov/ac, to find the names and addresses of licensed, registered testing and research facilities in your state.) Ask what measures they use to assess whether an animal is experiencing pain or distress and what they are doing to minimize pain and distress in their animal research. Encourage them to participate in The HSUS's initiative to eliminate pain and distress in laboratory animals.

THE DEBATE: ARGUMENTS FOR AND AGAINST THE USE OF ANIMALS

Whether it is for the pursuit of knowledge, health, or progress, animal experimentation is a highly controversial, often emotional issue, and one in which the same facts, sources, and philosophical arguments used to justify certain practices are also used to condemn them. The following sentiments reflect the wide range of attitudes in favor of and against animal research. Which, if any, do you agree with entirely? In part?

"Pithing a frog by the near instantaneous destruction of its brain is a death so rapid that, in comparison to how most frogs—and indeed most humans—die, pithing is charity, not cruelty."

—Howard C. Howland, Professor of Neurobiology and Behavior, *The Cornell Daily Sun*, 11/19/98

"From the perspective of a physician involved in clinical practice, education and research, I have come to the conclusion that killing and dissecting animals is not only unnecessary but also counterproductive in the training of physicians and scientists."

—David O. Wiebers, neurologist

"Without animal research, there can be no cures for illnesses such as cancer…"

—Americans for Medical Progress

"…while conflicting animal tests have often delayed and hampered advances in the war on cancer, they have never produced a single substantial advance either in the prevention or treatment of human cancer."

—Dr. Irwin Bross, Roswell Park Memorial Institute for Cancer Research, Congressional testimony, 1981

"As long as animals continue to be used in experiments, they must be given the maximum protection from pain and suffering, whatever the purpose for which they are used."

—Royal Society for the Prevention of Cruelty to Animals

"In the meantime, we must grapple with the paradox that nothing but research on animals will provide us with the knowledge that will make it possible for us, one day, to dispense with the use of them altogether."

—Sir Peter Medawar, 1960 Nobel Laureate in medicine

"If you cannot attain knowledge without torturing a dog, you must do without knowledge."

—George Bernard Shaw, Irish playwright, critic, and essayist (1856-1950)

Think About It

If you had to sum up your

views on animal research in a sentence or two, what would you say?

Utilitarianism

Some people argue for—or against—animal research based on a theory of morality that judges an action by its consequences rather than whether it adheres to a rule or principle. One such theory, *utilitarianism*, argues that an act is morally permissible if it leads to the greatest good for the greatest number.

But people differ in their beliefs about what constitutes "good" and "bad." For example, if a thousand rabbits are subjected to a painful procedure that makes it possible for millions of nearsighted people to see without eyeglasses, some would say the procedure is worthwhile and morally permissible. Why? They might claim that the benefit—millions of people having improved vision without eyeglasses—outweighs the cost (1,000 rabbits subjected to a painful procedure). On the other hand, some would argue that the benefit (not having to wear glasses) is trivial compared with the pain and ultimate death that 1,000 rabbits would be made to endure.

People who oppose animal research argue that it causes significant animal suffering and death for relatively little human benefit. Although many agree that animal research is acceptable as a way of developing important, life-saving medical treatments or procedures, they also note that the vast majority of animal use in research, testing, and education does not fall into that category. Much animal experimentation, they believe, produces obvious results or trivial benefits: Animals should not be tools for teaching seventh-grade biology or marketing a new floor wax or lipstick, or demonstrating that babies who are taken away from their mothers become depressed.

Think About It

Would you evaluate the morality of an action strictly in terms of its consequences? For example, is an action always right if it produces the greatest good for the greatest number? Why or why not?

Animal Rights

Many people approach the ethics of animal research from a different perspective—one that places a greater emphasis on rights than on consequences. Although a rights-based philosophy grants that some rights can take precedence over other, less important rights, it argues that rights cannot be violated just because doing so would have useful consequences. Instead of deciding whether the benefits of an action outweigh the costs, *rights-based* arguments center on another set of questions: What are an animal's rights, and how do they compare with a human's?

Think About It

In a 1989 survey, 80% of the American public agreed that animals have rights. In the same survey, however, 85% agreed that animals may be killed and eaten by humans. Based on the results of this survey, how do you think the public defines "animal rights"?

The majority of the public believes animals have some rights, but there is great disagreement about what specific rights they have and how they should be balanced against human needs and preferences. Many people say there are morally relevant distinctions between humans and other animals. Those differences are used to justify some of the ways we treat animals: as subjects of experiments, as food, or as a means for profit or entertainment. Thus, although most people admit that animals have rights, they accept that animals' rights may be sacrificed in the interest of certain human rights or gains. As a result, arguments against or in favor of protecting animals often focus on things like animals' worth: Are the animals common or rare? Do they appeal to human emotions? Are they like us in their capacity to reason or socialize? Can they use tools or language? Do they play a valuable role in the environment? Are they companion animals? Are they intelligent or self-aware?

The answers to these questions play a vital role in our attitudes about animals and how they ought to be treated. Some people, however, criticize this way of thinking. They argue that animals should not be judged by criteria or values that people assign to them.

When it comes to animal research, determining where to draw the line between animal rights and human rights is made even more difficult because people don't always agree on the facts. Those who favor using animals usually claim that research causes relatively little pain or distress to animals. They also say it has the potential for significant human and animal benefit, as evidenced by organ transplantation, modern surgery, the discovery of insulin, and the development of vaccines and new chemotherapies that are effective in humans and other animals. Critics, however, say that claims about the contributions of animal research to modern medicine are frequently exaggerated. They point out that in some cases, animal research has produced false or misleading information or has simply confirmed what human clinical studies or common sense had already made clear.

Think About It

If rights are based on characteristics such as intelligence, are people with mental disabilities less deserving of rights than other people?

Inherent Value

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Few people would disagree that many animals, such as birds and mammals, have beliefs, preferences, and memories. Like us, they are capable of experiencing pleasure and pain. Having these capabilities means that animals—unlike trees—aren't merely alive; they have a life. What happens to animals matters to *them*, even if it doesn't matter to others. According to the animal rights position, this is what gives animals *inherent* value—value that doesn't depend on their usefulness or value to anyone else, including humans.

Animal rights proponents argue that animals have a right not to be treated in ways that disregard their inherent value. Our treatment of animals should reflect what is in the best interests of animals, not necessarily what is in *our* interests. People who adhere to a strict animal rights philosophy therefore maintain that animals shouldn't be killed or made to suffer for human benefit, no matter how great that benefit may be. They claim we have no moral right to eat a turkey sandwich, wear leather shoes, or use rats to develop more effective medicines—because, they say, such rights are overridden by animals' right to be treated as ends in themselves, not as means to an end.

Think About It

- How is a rights-based philosophy at odds with utilitarian thinking? What are the advantages of each line of reasoning?
- How would you define the concept of animal rights? Does a clam have rights? A shark? A dog? A bear? What characteristics, if any, would you say entitle humans or other animals to certain rights?
- What happens when human rights or preferences conflict with animal rights: Should human rights or preferences override animal rights—sometimes, always, or never?

Should we raise animals for fur or meat? Use them in rodeos or circuses? Exhibit them in zoos? Dissect them or conduct research on them? Are our needs for certain standards of health or living, or forms of amusement, recreation, education, food, or dress more pressing than animals' rights not to be exploited or killed? Are these practices acceptable if efforts are made to treat animals humanely? Here again, opinions vary widely. Reflect on some of these questions and poll friends, classmates, and family members to see what their opinions are.

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Public Attitudes Toward Research

In recent years, a number of surveys have at-

tempted to find out more about the public's attitudes about science and animal welfare, including where people stand on the issue of animals in research and education. Studies have shown that most Americans have a positive view of scientific research but that they are deeply divided in their support of certain technologies (genetic engineering and nuclear power, for example) and in their views on using animals in research. Although most Americans support the use of animals, the majority is not as large as it was in the past. In the United States, approximately 15-20% of the population believes all experiments on animals should stop immediately.

Studies reveal that several factors may contribute to people's attitudes toward research. Some have to do with the research itself: its purpose, what kinds of animals are used, the perceived benefits to human health, and whether or not alternatives are available. But other variables may also account for why different people have more or less favorable attitudes toward animal research. These may include personality characteristics, scientific literacy, religious beliefs, age, gender, political views, activism, and personal, societal, and cultural attitudes toward animals.


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Many studies have attempted to draw correlations between factors such as these and people's attitudes toward animal research. Below are findings from some such studies. Do any of the results conflict with each other? Do any of the results surprise you? Why or why not?

▲ More women than men tend to be opposed to animal research.
▲ The more scientific knowledge people have, the less they support animal research.
▲ The less scientific knowledge people have, the less they oppose animal research.
▲ Scientific knowledge, or lack of it, has no consistent relationship with attitudes toward animal research.
▲ Students likely to encounter animal experimentation in their studies (i.e., psychology, biology) oppose animal research more than other students.
▲ Students majoring in social science (psychology, anthropology, political science) are more likely to oppose animal research that those majoring in applied science (mathematics, computer science, engineering).
▲ There are no significant correlations between people's religious beliefs and attitudes toward animal research.
▲ Fundamentalist and conservative Christians are more approving of animal research than liberal Christians.
▲ People with higher levels of education have more negative views of animal research.
▲ People with liberal political views are more opposed to animal research than those with conservative views.
▲ The Canadian public is more strongly opposed to animal research than the American public.
▲ People in most European nations are more strongly opposed to animal research than people in the U.S. and Canada.
▲ In a 1991 survey, 50% of respondents in France said they strongly disagreed with the use of dogs and chimpanzees in research. In Japan, 49% of survey respondents agreed with the use of dogs and chimpanzees, and only 6% strongly disagreed.
▲ People who are highly concerned about environmental issues are more likely to oppose animal research.
▲ People in highly industrialized, urbanized nations are more opposed to animal research than those who live in less developed countries.
▲ People who oppose animal research are "deep thinkers" who are also concerned about racism, sexism, war, pollution, and poverty.
▲ People who oppose animal research are "feeling" types; those who support it are "thinking" types.
▲ More pet owners are opposed to animal research than people who don't have pets.

Think About It

The specific wording of a question about animal research and the context in which it is asked can affect how people re-


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spond. In addition, positive and negative media coverage of animal experiments or medical breakthroughs may also have an impact. What other factors could account for more or less favorable attitudes toward animal research or discrepancies in survey results?

What these studies make clear is that we ought not stereotype people on any side of the debate. Many animal protectionists believe animal research is necessary and that people and animals can benefit from it. Some of the most vocal, articulate critics of animal experimentation are physicians, biology teachers, and researchers themselves. Are there certain beliefs both sides might espouse and certain facts both can agree on—and so enter into constructive dialogue?

Think About It

Saying that animals have rights is not necessarily the same as saying that animals and humans have equal rights. For example, most Americans would defend humans' reproductive rights and disagree with mandatory sterilization as a way of controlling our population. On the other hand, many of the same people would advocate spaying or neutering of cats and dogs as morally right. Can you think of other examples that illustrate different legal or moral rights for humans and animals?

Questions and Issues for Discussion

Beliefs about animals' rights, or lack thereof, depend largely on people's assumptions about the rights and status of human beings. Do you believe human status is elevated above that of animals? Why or why not? If humans are morally, intellectually, or divinely superior to animals, does that mean we are entitled to use animals any way we wish? Does it mean we are morally obligated to treat them with compassion and respect?

Explore the Issues

How would you go about deciding among the various claims made by individuals and organizations on opposite sides of the animal research debate? Write to various organizations, explore the Internet, and read literature on the issue. A list of books, Internet sites, and other resources is included in this booklet. See page 42.

Take Action

Hold a debate at school on the issue of animals in research. Invite speakers on all sides of the issue to prepare a case by presenting facts and viewpoints. You may wish to prepare a set of specific questions, in advance, to which members on each team have an opportunity to respond. Encourage the audience to ask questions too. Be sure your debate is fair and balanced by allowing each team to have an equal voice—that is, the same number of speakers and the same amount of time to present their case. At the end of the debate, allow the audience to judge which team made the most effective argument. Can participants reach a consensus on any of the main issues? Do they agree on some of the subordinate issues? On which issues do they seem to reach a stalemate?

ALTERNATIVES

No matter what their position on the use of animals, people on all sides of the debate can agree on the need for scientific progress and literacy. The question, then, is this: Can we maintain high standards for scientific research, testing, and education without maintaining our current use of animals? That is, if we use fewer animals or modify experimental procedures to cause less pain or distress, will we sacrifice scientific productivity?

A trend in recent decades has already begun providing some answers. Although scientific knowledge and output have grown, animal use has dropped substantially. (See the tables below.) Laboratories throughout Europe, Japan, and North America have reported as much as a 50% decrease in the number of animals they use.

What accounts for the downward trend in ani-

Scientific Procedures* Performed on Animals in Great Britain

Year	Approximate Number of Procedures
1900	12,000
1910	110,000
1920	90,000
1930	500,000
1940	1,095,000
1950	2,188,000
1960	4,430,000
1970	6,864,000
1980	5,633,000
1985	4,034,000
1990	3,207,000
1995	2,710,000
1999	2,652,000
2000	2,710,000
2002	2,732,712

Adapted from Home Office (UK) *Statistics of Scientific Procedures on Living Animals*

*"Procedures" is roughly equivalent to the number of animals used, although (rarely) some animals are used more than once. Sometimes, too, genetically modified (GM) mice are counted twice: once for the procedure that creates the genetic modification and again for any subsequent procedures.

Animals Used in Research in the United States

(since the first USDA reporting year)

Year	Total Number of Animals
1973	1,653,345
1974	1,692,527
1975	1,625,660
1976	1,922,100
1977	1,519,669
1978	1,687,201
1979	1,832,045
1980	1,661,904
1981	1,658,441
1982	1,577,292
1983	1,680,242
1984	2,074,133
1985	2,153,787
1986	1,778,403
1987	1,969,123
1988	1,635,288
1989	1,754,456
1990	1,578,099
1991	1,842,420
1992	2,134,182
1993	1,704,505
1994	1,624,649
1995	1,395,463
1996	1,345,739
1997	1,267,828
1998	1,213,814
1999	1,217,998
2000	1,286,412
2001	1,236,903

Source: *USDA Annual Report*, 2001

By illustrating data, graphs give a clear visual comparison of numerical quantities. Using the figures in either of these tables, create a simple line graph showing the trends in animal use in the U.S. or Great Britain. (Information about the numbers and species of animals used in research in the U.S. is updated each year in the USDA's *Animal Welfare Report*, available at **www.aphis.usda.gov**.) Note that the USDA statistics do not in fact provide a reliable trend line; USDA annual reports often contain mathematical errors, and the listing of animals within those reports has changed several times between 1973 and 2004.

mal use? How has it been possible to use fewer animals—or conduct fewer or less-invasive procedures—without compromising human health, education, and environmental safety? An important contributing factor has been scientific research itself. Better experimental design and more sophisticated technology have produced effective alternatives to procedures that harm or kill animals.

The Three R's

Although people generally think of alternatives as methods that completely eliminate the use of animals, alternatives can in fact be divided into three categories, otherwise known as the Three R's. Some methods replace the use of whole living animals in research, testing, or education. Some reduce the number of animals needed to produce statistically valid results. Others refine an experiment or technique so as to minimize the incidence or severity of pain and distress that animals experience. Examples of alternatives include:

- studies of people, such as *clinical examinations* of individuals with certain diseases, *epidemiological surveys* of naturally occurring dis-

Replacement or Refinement?


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There is some disagreement over whether alternatives generally thought of as replacements for using animals may more accurately be considered refinements. (Refinements still rely on animal use but either use techniques that are less painful or distressing or organisms that are less capable of experiencing pain.) Many alternative tests, for example, use embryos, raise antibodies in animals, or obtain cells, eggs, or blood from living animals.

Whether an alternative is considered a replacement or refinement depends upon several factors, including how "animal" and "animal use" are defined. If tissue from a living animal is used in research that previously relied on several whole animals, would you classify that technique as a replacement, a reduction, or a refinement? Would the species of animal or its ability to feel pain influence your decision? Would it matter whether the animal was killed at the end or as a result of the research?


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Octopuses are invertebrates and thus can be considered replacements for other animals in certain types of research. As such, they are generally not protected by the same regulations that govern the care of other animals in laboratories, such as monkeys or cats. In Britain, however, octopuses have been categorized as "protected research animals." Do your own research into the natural history of octopuses; consult wildlife encyclopedias and Internet sites. Based on your findings, how would you explain the decision to give these animals special protection?

ease patterns within populations, written *case histories* of human behavioral, psychological, and physiological conditions, or *postmortem examinations* (autopsies) to determine the nature and cause of a disease.


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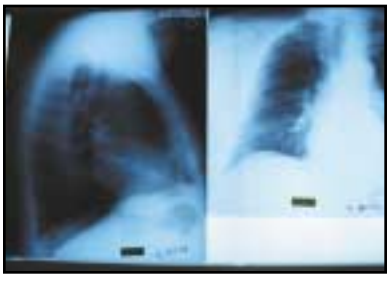
■ in-vitro (test tube) studies, in which cells and tissue, as opposed to whole living organisms, are used to test the effects of drugs and viruses and investigate biological processes.

■ chemical and physical techniques such as *chromatography* (a means of separating components of a chemical mixture using gel, silica, or filter paper), *mass spectrometry* (separating atoms or molecules according to their mass and electric charge), *magnetic resonance imaging* (MRI), and *ultrasound*. These can analyze the composition, chemical properties, and potency of a substance without using animals. (Chemical diagnostic kits, for example, have replaced the use of rabbits in pregnancy testing.) They can also be used to examine tissue and diagnose problems without vivisecting (cutting open) or killing animals.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■ studies using invertebrate animals (such as insects), vertebrate embryos, amoebas, protozoa, plants, and other organisms with little or no capacity for pain.

■ tests using fertilized chicken eggs. Such tests have long been used, with much success, in research and cosmetics testing. (Fertilized egg membranes lack nerves but comprise a delicate network of blood vessels that may be as sensitive to inflammation as the human eye.)


© Dr. J. Leighton/Peralta Cancer Research Institute

■ mathematical and computer models of bio-

logical systems to predict the potential benefit or harm of a substance. By analyzing information on compounds that have already been tested, computer models can provide irritancy and toxicity ratings of untested substances. Furthermore, computer analysis of the structure of molecules has led to the development and testing of antibiotics and other drugs.

■ databases that enable investigators to research previously published information about pharmaceuticals and apply that knowledge toward the discovery of new uses for drugs.

■ models. "Crash-test dummies" are an example of mechanical models that have replaced animals in automobile safety testing. Mechanical models also include *patient simulators*, computer-linked mannequins that are increasingly replacing animals in medical/surgical training. Plastic models of humans, bullfrogs, clams, fetal pigs, earthworms, and other animals are useful for the study of anatomy. Unlike preserved specimens, which are usually faded, plastic models typically have labeled, removable parts that are colored to reflect the appearance of a healthy, living organism. Also unlike animal specimens, plastic models can be used year after year.

■ ethology, the study of animals in their natural environment. Besides encouraging students to appreciate animals' natural behaviors, needs, social roles, and evolutionary history, well-planned field studies allow them to carefully design a study, formulate hypotheses, observe, collect, analyze, and present data, and make conclusions. Students may also observe certain animals in class, following guidelines for humane, noninvasive study. (Guidelines are available from The HSUS Youth Education Affiliate.)


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■ textbooks and audiovisual aids, including videos and CD-ROMs, to replace dissection and other animal use in education. (Computer simulations, for example, illustrate anatomical systems and allow students to electronically "dissect" animals.) These can be read or viewed more than once, allowing a class to carefully study a principle or procedure. Students can then apply information to hands-on projects such as flower dissection or the construction of models of frogs or other animals.

■ physiological self-study, by which students practice monitoring their own (or their classmates') heart function, respiration, muscle physiology, sensory perception, and blood pressure.

■ clinical internships, in which students observe medical and veterinary surgeries.


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Clearly, a broad range of investigative methods is available to scientists and students, and exciting progress continues to offer better, more sensitive alternatives. Indeed, several alternative-based discoveries have received Nobel Prizes in medicine and physiology and have been credited with some of the most pivotal discoveries in the field of genetics: the role of chromosomes in heredity (using fruit flies), recombination of DNA (using bread mold), control of genes by other genes (using bacteria), and mobility of genetic elements (using corn).

New technology can detect, predict, and rank skin and eye irritation for raw materials (single ingredients), formulas (mixtures of ingredients), and whole products, ranging from cosmetics to industrial chemicals. Early in 1999, Charles River Laboratories, the world's largest supplier of animals to laboratories, began marketing CaseTox, a computer software program that evaluates a drug's toxicity (in the early stages of the drug's development) based on its molecular structure. That same year, an NIH federal advisory panel approved Corrositex, a test for household and industrial chemicals that uses a form of artificial skin made of collagen. Chemicals such as those


In Vitro International

Does "Pethood" Count?


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An article in the *Wall Street Journal* ("Cuteness Counts: Guinea Pigs Will Be Guinea Pigs No More," January 5, 2000) reported that new federal regulations call for an end to the use of guinea pigs in a chemical test conducted by Procter & Gamble and other consumer-products companies. The test, which checks for allergic reactions in skin, accounted for unrelieved pain and distress in 10,200 animals in 1999. Instead of guinea pigs, the test will now use mice—approximately 25 in an average test, as opposed to 40 guinea pigs. In addition, the test's procedures have been refined to cause less pain and distress. Do the changes to this test constitute replacement, reduction, refinement, or some combination of these?

According to the article, a federal spokesperson said that one factor in the decision to use mice (instead of guinea pigs) is that they are considered a non-pet animal. Would you agree or disagree with this assessment? What might be some other reasons mice have increasingly become the animals of choice in testing, genetic engineering, and other laboratory applications? Do you think whether or not animals are classified as pets is relevant in decisions regarding their use in research? Why or why not?

found in toilet bowl cleaners or drain openers are evaluated based on how quickly they penetrate the layer of artificial skin. (Similar tests use skin grown from human cells in culture.) If a chemical is not shown to be corrosive, it is then tested on animals to determine if it is a skin irritant. Thus, although animals would still be used in tests of consumer chemicals, they would not need to undergo the more painful testing of acids and other chemicals that result in corrosive skin lesions.

Cell biologists have also demonstrated that they can grow human corneas in a laboratory, reducing and potentially replacing the need for rabbits in Draize eye irritancy testing. (The ability to grow human corneas may also someday prove valuable in human eye research and surgeries, such as cornea transplants.) Similarly, the National Cancer Institute now uses human cell cultures as the primary chemical screen for new anti-cancer drugs, thus reducing its use of mice by several million.

More than Meets the Eye: The Case of Cosmetics Testing

The increased availability of alternatives and the public's demand to make better use of them have made perhaps the most measurable difference in cosmetics testing. Cosmetics that are not tested


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on animals have assumed a greater share of the international market as more manufacturers limit or abandon animal use in favor of other approaches. Understandably, other companies—those that continue testing on animals—are the target of criticism, protests, and boycotts. But the label "does" or "does not" test on animals sometimes ignores a more complex reality.

In 1980, animal-rights groups targeted Revlon in a campaign to abolish its use of the Draize test. The cosmetics giant eventually resolved to stop all testing on its cosmetics and rely instead on a mix of historical data, human patch testing, and animal data provided by the companies that supply raw materials for its products.

In 1981, Procter & Gamble, which produces not only personal care products but also household products and pharmaceuticals, was approached about its animal testing. The company invited animal activists to present their arguments and, as a result, agreed

to reevaluate its entire testing program. Although P&G decided it would have to continue some safety and efficacy testing on animals, the company began to vigorously pursue alternatives.

For the past 22 years, scientists from P&G have been strong advocates of the need for alternatives and have done much important research in this field. They have aggressively argued for alternatives and better test methods in both national and international forums on chemical safety regulation and have spent more than $100 million researching and developing alternatives. Procter & Gamble, in fact, helped subsidize the development of artificial human corneas at the University of Ottawa.

Today, Revlon is not directly testing on animals but is not actively promoting alternatives either. P&G continues some testing on animals but is also a leader in developing and promoting alternatives.

Think About It

- Within the same industry, do you believe that companies that do not test on animals have a greater, lesser, or equal obligation to devote time and resources to developing alternatives as companies that continue animal testing? Explain.
- Part of the challenge in adopting alternatives is that not enough resources have been devoted to developing them and not enough priority has been given to validating them. Most traditional animal tests, even those that are notoriously unreliable, have passed into common use *without* ever having been validated. Newer alternatives, on the other hand, *must* be validated by meeting rigorous standards for efficacy and accuracy. What, if anything, do you think should be done to resolve this double standard?

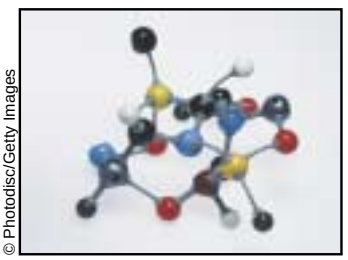
Other Trends for Other Animals: Genetic Engineering

In 1973, more than 195,000 dogs were used in research in the United States. By 2001, that number had fallen to 70,082, representing a 64% drop in the use of dogs. Within that same period, the number of cats used also diminished by 65%. Similarly, research on hamsters dropped by more than half and the use of guinea pigs and rabbits by more than a third.

© HSUS

Despite these trends, not all animal research has dramatically declined. Scientists are increasingly relying on genetic engineering to study human problems and diseases, and mice are the species most commonly used. In the U.S., the number of mice being housed and bred in large universities and research institutions appears to have at least doubled in the last ten years. The National Association for Biomedical Research estimated that about 23 million rats and mice were used in research in 1999 and that this number would greatly increase within three years. In the U.K., the number of genetically modified mice has risen from less than 50,000 to 692,576 in 2002.

Genetic engineering allows researchers to breed new strains of animals, called transgenics, by injecting certain genes into an animal's eggs. The altered embryos are implanted in a female animal, and some of the offspring are born with specific traits that researchers want to study. For example, mice and pigs have been genetically engineered to have body parts from humans or other animals. Some have been created with diseases or viruses, such as HIV, built into their genetic code. Others, called *knockout strains*, have been bred with particular genes eliminated.



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The upsurge in genetic engineering has attracted widespread public attention and raised broad ethical concerns. The problems and promise of creating genetically altered animals have also raised issues specific to the animal research debate. On one hand, "designer" mice allow researchers to use fewer animals in more precisely targeted studies that may reveal more about the progression and treatment of disease. On the other hand, large numbers of animals are needed in the process of creating each new strain. What's more, animals—mice created

with human ears on their backs or with viruses that don't normally occur in their species—are being manipulated as never before.

Think About It

Is breeding transgenic animals a good alternative to traditional animal research? Explain.

Changing the Rules: Replacing, Reducing, Refining

Unquestionably, while alternatives have made it possible to reduce or replace animal use, certain tests and research experiments still rely on the study of animals and the complex interactions that occur in whole, living organisms. In those cases, researchers are urged to investigate and implement refinements, not only with regard to the types and number of animals used but also with regard to experimental design. For instance, some companies have substituted the LD50 Test with the Limit Test. In this version, lower chemical doses are given to animals. Doses are stopped before the animals experience a painful death.

Refinements in care and housing can also significantly improve conditions for animals in laboratories. Such improvements include housing social primates (such as chimpanzees) in pairs or groups rather than alone, providing dogs with playtime, and giving mice paper towels with which to build nests. Though these changes may seem modest—a paper towel, an opportunity to play—in the lives of individual animals capable of pain, fear, and pleasure, they are significant.

Because research can cause pain in animals, providing medicines for pain relief is another important refinement. In Britain, the use of anesthetics doubled from 1985 to 1990—to coincide with a new law concerned with reducing animal pain and distress. Thus, although technology has been responsible in great part for the increase in alternatives, so have laws and regulations.

Think About It

How can we encourage manufacturers, regulatory agencies, and research institutions to adopt the Three R's through legislative means? With financial incentives? On scientific grounds? From a public relations perspective?

Questions and Issues for Discussion

Many public and private organizations provide funding for research. Should they invest a certain portion of money into research that uses or develops alternative methods? If so, should they be *required* to do so? Why or why not?

Explore the Issues

• Check your medicine cabinet and supply of house-hold products. Then locate natural food stores in your area or online. Do they carry animal-friendly alternatives for some of those products?

• Promoting alternatives is an excellent opportunity for the animal protection and research communities to work together toward a common goal. To that end, The HSUS presents the Russell and Burch Award every three years to one or more scientists who have made outstanding contributions to the advancement of alternatives. (The award is named in honor of William Russell and Rex Burch, the scientists who formulated the Three R's approach.) Learn more about researchers who have shown an exceptional commitment to the protection and humane treatment of animals. Visit www.hsus.org and click on "Animals in Research."

Take Action

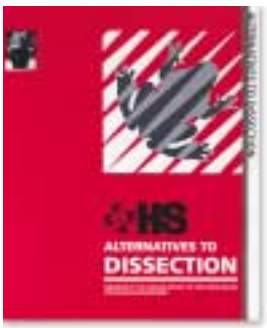
• Be an informed, compassionate consumer. Labels on cosmetics and other products may give no obvious indication that a product was tested on animals or contains animal ingredients.

• Many consumer products are not tested on animals but made with ingredients known to be safe. Find out which brands are not tested on animals. Check their labels, keeping in mind that the CCIC logo (see page 11) provides the best assurance that no animal testing—by the company, its laboratories, or suppliers—is used in any phase of a product's development.

• Host a presentation about alternatives to animal experiments for students and faculty in your school. To give the audience an overview of what's being done in the field of alternatives, describe some specific innovations in research, testing, and education or invite guest speakers from these professions to address your group.

You may wish to supplement your presentation with a showing of *Alternatives in Education*, a new 33-minute life science video featuring state-of-the-art alternatives to animal use. The video, produced by the nonprofit humane education network InterNICHE, may be ordered at www.interniche.org.

• Help yourself to some great alternatives! The Hu-mane Education Loan Program (HELP) offers a variety of up-to-date alternatives to dissection and live animal experimentation. Students and teachers are invited to borrow CD-ROMs, computer diskettes, models, videos, charts, and other materials. Learn more about HELP at www.hsus.org or E-mail ari@hsus.org. You may also order *Alternatives to Dissection*, a packet of projects designed to meet the traditional objectives of dissection—such as knowledge of comparative, structural, and functional anatomy—without harming animals. The packet includes activity sheets, a comprehensive list of resources, and experts' statements on dissection and is available from The HSUS Youth Education Affiliate, www.nahee.org.



• Draft a dissection choice policy to present to your school principal, superintendent, PTA, and the head of your school's biology department. Your policy proposal should ask that (1) students be allowed to choose alternative lessons that don't involve dissection; (2) the choice policy be made known to students at the outset of each biology course; (3) teachers provide the necessary guidance and assistance in selecting alternative methods of study; (4) students' grades are not affected by their choice not to dissect; and (5) testing and evaluation measure students' knowledge of course material rather than the process of dissection itself.

LAWS

For as long as animals have been the subjects of research, dissection, and testing, people have expressed concerns about their use and treatment. Public concerns have, in turn, given rise to laws and policies aimed at protecting animals—by regulating the ways in which they're acquired and transported, improving conditions under which they are housed and how they are treated, or reducing or eliminating their use altogether. In fact, as early as the late 1800s, following the lead of Britain's 1876 Cruelty to Animals Act, bills were introduced in the U.S. Congress to regulate the use of animals in research.

The AWA and Amendments

Today, the primary federal law governing the treatment of animals in research in the United States is the Animal Welfare Act (AWA)—a set of laws requiring that research and testing facilities meet minimum standards for animal care, including requirements for handling, feeding, housing, sanitation, ventilation, shelter from extreme weather, veterinary care, and separation of species when necessary. The AWA covers private and state-owned research facilities, drug firms, and diagnostic laboratories. (Federal institutions are *not* regulated by the U.S. Department of Agriculture but do submit annual reports and are expected to comply with the Animal Welfare Act.) School laboratories, on the other hand, are exempt from this law. So are facilities that use only *non-regulated* animals, like mice and rats, or *biologic* (dead) specimens. For the full text of the AWA and links to other legislation, visit www.nal.usda.gov/awic/legislat/usda/eg1.htm.

Originally passed by Congress in 1966, the Laboratory Animal Welfare Act (as it was then called) sought to protect pets against being stolen and sold to research facilities. The act was very limited, applying mainly to the way dogs and cats are acquired, transported, and sold to research facilities, without addressing how they—or any other animals—should be handled inside the facility's doors.

In 1970, the AWA's reach was extended to protect all mammals and birds. (However, at the discretion

of the Secretary of Agriculture, birds, mice, and rats are not included in this protection.) In addition, researchers had to provide animals with appropriate anesthetics, pain medicines, and sedatives unless they could successfully argue that doing so would compromise their research results.

In 1985, the AWA was strengthened even further with amendments that include the following:

▲ A mandate that research personnel be properly trained and knowledgeable in animal care as well as anesthesia, analgesia, and euthanasia.

▲ Required USDA inspection of research facilities at least once a year.

▲ Consideration of animals' environmental and social needs that extend beyond minimum standards for care and housing. For example, dogs in research facilities must be allowed to exercise through play or by being given adequate floor space or open space in which they can run. Primates, such as chimpanzees, must have an enriching environment that promotes their psychological well-being. Such an environment could include toys, perches, mirrors, swings, and opportunities for the animals to "forage" for food and see, hear, and interact with humans and other primates.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▲ Establishment of the Animal Welfare Information Center (AWIC), a national service for researchers, technicians, administrators, and the public. AWIC manages an online directory of information on alternative research procedures, animal-care training workshops for research personnel, and methods of alleviating animal pain and distress in animals.

▲ A requirement for each research facility to have an Institutional Animal Care and Use Committee (IACUC) to monitor its treatment of animals. The committee does this in a variety of ways. Besides conducting inspections of the facility to certify that it complies with the AWA, an IACUC must evaluate proposed research projects to determine whether the research serves a clear scientific purpose that justifies the use of animals—such as providing results that benefit human or animal health or increasing knowledge about behavior, biological processes, or the species being studied. In particular, the IACUC needs to make sure that the species and number of animals used are appropriate for each kind of experiment; that, in experiments involving pain or distress, alternatives are considered when possible; and that animal pain and distress are minimized.

Think About It

According to the AWA, a research facility's IACUC must have at least three members, one of whom is the facility's attending veterinarian. At least one IACUC member must be someone *not* affiliated with the facility—or even with the scientific community. In this way, the AWA ensures some public participation in the oversight of animal research. Who else do you think should be part of an IACUC, and why? What might be some other ways of increasing public involvement in decisions regarding animal research?

When it was first enacted, the Animal Welfare Act dealt mainly with the care and maintenance of laboratory animals without addressing *how* or *why* they were used. The methods and goals of animal experiments were up to individual researchers and rarely came under question or scrutiny. With requirements for researchers to justify their use of animals or seek available alternatives, the 1985 amendments began to change that. Critics point out, however, that the law still has not gone far enough in protecting the millions of animals used each year in research.

Problems with the AWA

When Congress first enacted the AWA more than 30 years ago, the intent was to prevent lost and stolen pets from entering the research animal trade. Ironically, throughout its history, the Act has


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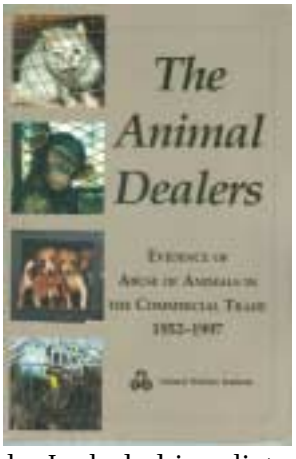
had little success addressing even this fundamental problem. Part of the problem rests with "random-source" Class B animal dealers, people who do not breed animals specifically for research facilities but purchase them at auctions, "adopt" them from animal shelters, or acquire them through newspaper ads offering puppies and kittens free to a good home. After obtaining animals, dealers sell them to laboratories. Nearly all the problems related to the acquisition of laboratory animals, such as the appearance of stolen or "lost" family pets in laboratories, have been traced to the practices of Class B dealers.

The USDA, which not only develops but enforces laws under the AWA, has been criticized for failing to protect against pet theft by ignoring repeated violations by Class B dealers and not acting quickly enough to put serious offenders out of business. It should be noted, however, that cats and dogs are often transferred from dealer to dealer, moving across state lines several times. This fact makes it difficult for inspectors to trace the sources of animals and make sure they are legitimate. Even when the USDA permanently revokes dealers' licenses, unscrupulous dealers may stay in business for years by having friends or relatives obtain licenses in their own names.

Fortunately, in recent years, the USDA has been more effective in policing Class B dealers. For more information on this issue, read *The Animal Dealers: Evidence of Abuse of Animals in the Commercial Trade, 1952-1997*, a 395-page book published by the Animal Welfare Institute that exposes the widespread fraud, cruelty, and negligence associated with commerce in animals. Included is a list of case histories, USDA regional offices, and licensed Class B dealers.



Think About It

Many people, including animal advocates, researchers, and lawmakers, have suggested the USDA stop licensing Class B dealers and prohibit the sale of animals from "random sources" to laboratories. Do you agree or disagree? Explain.

Better measures against preventing pet theft are not the only improvements needed in the AWA and the USDA's regulation of it. Here are some of the major recommendations The HSUS and other animal protection groups have made with regard to the current law.

• Stronger enforcement. To enforce the AWA, *veterinary inspectors* (who report on research facilities) and *lay inspectors* (who report on animal dealers) conduct unannounced, randomly scheduled inspections. A key problem is that there are not enough inspectors—or enough funds—to do the job. By 2001, the USDA had only 82 field inspectors to ensure that the 2,506 research facilities, 4,739 dealers, 2,549 exhibitors, 300 handlers, and 77 carriers were complying with the law. To add to the problem, inspectors have claimed that higher-level USDA personnel often ignore their reports of violations or their recommendations to suspend or revoke a facility's license. The Inspector General's Report indicates that the USDA has in fact renewed licenses for facilities that have been cited for violations and have not corrected them.

More than 400 organizations, including zoos, animal protection groups, and biomedical research firms, have asked the government to allot more money to USDA enforcement. In large part due to their efforts, more than $12 million was appropriated for enforcement of the Animal Welfare Act in 2001, up from about $9 million in 1996.

• Better monitoring of research projects. IACUCs were established to limit objectionable or unnecessary animal use in research, especially in painful experiments. For their part, researchers must inform IACUCs about procedures likely to cause pain or distress in animals. Before receiving the committee's approval for such experiments, they must also prove they have considered alternatives to animals. In some cases, however, IACUCs may approve experiments even if researchers have not supplied adequate information about pain, distress, or alternatives. Committee members may be uncertain about their authority to challenge researchers or the scientific value of their work—

even if they believe an experiment is trivial or unnecessarily painful. The USDA, therefore, should be more explicit in their direction to IACUCs to evaluate experiments based on their cost to animals versus their benefits.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• Thorough, standardized reporting. For several reasons, the USDA's annual reports on research animal use are inaccurate and incomplete. They give no statistics on mice and rats, the species most commonly used, nor do they necessarily include information from federal laboratories or facilities that have turned in their reports late. The accuracy of USDA reporting is questionable not only in terms of numbers but also with regard to the nature of animal use and care. Part of the problem is that the agency has not established precise definitions for animal use and treatment. For example, because the criteria for "painful" and "non-painful" experiments are not clearly spelled out, different research institutions may interpret these categories very differently. Similarly, language like "humane" and "primate psychological well-being," which appear in AWA regulations, are not defined in terms of specific standards. (Although Congress required the Secretary of Agriculture to do so, the Secretary instead drafted a policy allowing individual research facilities to develop their own definitions of these terms.)

• Protection for more species. At least nine out of ten animals used in research—namely, mice and rats—receive no protection at all under the Animal Welfare Act. Facilities that use only these species are not subject to USDA inspection or reporting and are not required to seek alternatives to their animal use. Many groups, including The HSUS, have petitioned the USDA to provide coverage for these animals under the AWA—coverage that would legally afford them the most basic standards of humane care and housing. These petitions have been unsuccessful to date.


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On the Local Level

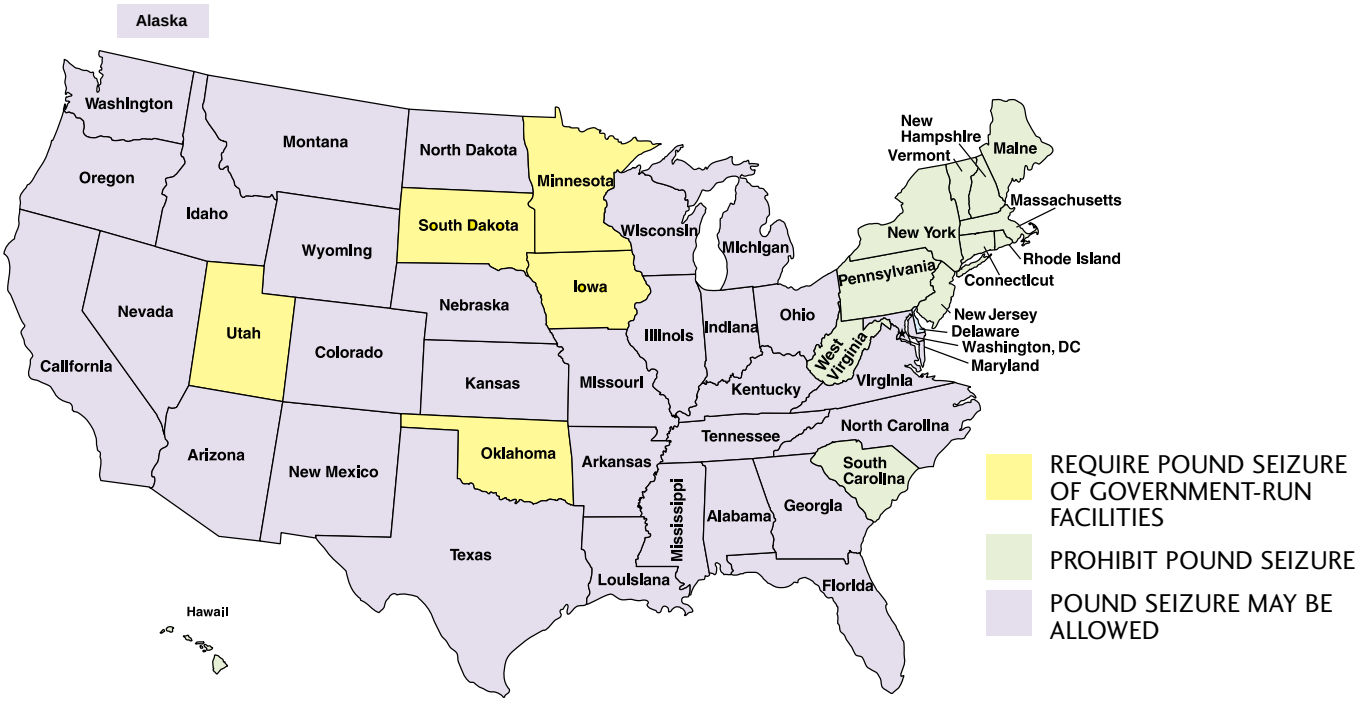
In addition to federal laws, including the Animal Welfare Act, Horse Protection Act, and Humane Slaughter Act, several state statutes and local ordinances have been drafted to protect animals. These laws are usually enforced by police departments or, in some cases, health departments or local humane societies. Some regulate activities related to animal use in research. For example, in California, results from live animal experiments involving injury, impact, or crash are now inadmissible as evidence in motor-vehicle-related lawsuits. Because automobile manufacturers can no longer point to animal tests in court to claim their cars are safe, there is less incentive for them to use animals in such experiments.

Some state laws apply to the practice of "pound seizure"—the mandatory release of cats and dogs from animal shelters for use in biomedical research, product development, testing, and education. Currently, fourteen states have laws prohibiting this practice. On the other hand, three states have laws *requiring* municipal (publicly funded) animal shelters to turn over animals to research facilities. Some allow researchers, under certain conditions, to have access to animals from municipal shelters, while the remaining states have *no laws* at all regarding pound seizure—leaving the matter to the discretion of individual towns and cities.

How is pound seizure regulated in your state? Consult the map on page 37, check with your state legislators, or log on to www.AnimalLaw.com.

The HSUS has played a key role in efforts to prohibit pound seizure, as have professionals in the research and medical communities. In a 1983 campaign to ban pound seizure in California, the following statement was signed by more than 700 physicians, veterinarians, and research scientists:

Pound seizure is an ill-conceived practice damaging to the good name of science and to its quality. The use of animals from shelters for experimentation is not only unnecessary and unethical, but it is detrimental to sound research. Strays are of undetermined genetic, environmental, and medical background. They react unpredictably and inconsistently, making questionable the reliability of most research in which they are used.



School Rules

Although school laboratories are not regulated by the AWA, many of them operate under state or local laws—or their own school policies—that address the use of animals. Since 1987, approximately one-fourth of states have seen the introduction of bills to restrict the use of animals for educational purposes. Eight states have enacted laws to prohibit or restrict high-school students from performing harmful science fair projects on vertebrate animals. Several states, including Florida, California, Pennsylvania, Maine, Louisiana, Illinois, New York, Rhode Island, and Virginia, have laws upholding students' rights to select humane alternatives to dissection without having their grade negatively affected. Similar legislation has been introduced in Massachusetts and New Jersey, and many schools and school boards, such as the Chicago Public School System, have independently enacted student choice policies.

Dissection first became a legal issue in 1987, when Jenifer Graham, a sophomore at Victor Valley High School in California, refused to dissect either an earthworm or a frog in her biology course. A vegetarian with strong beliefs about animal rights, Jenifer objected to dissection on moral grounds. She explained her ethical objections to her school principal and asked that she be allowed to study using alternatives. Her request was denied, and she received a zero for the dissection exercise. Discouraged but determined, Jenifer took tutorial sessions to supplement her biology coursework and completed her tutorials with an A. The director of Biological Sciences Curriculum Study in Colorado supported Jenifer's alternative study, saying she likely gained from it a better understanding of vertebrate structure and function, ecology, and phylogeny than she would have by cutting apart a frog.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With help from attorneys and The HSUS, Jenifer began a long process of legal measures that resulted the following year in a change to the educational code in California. In March of 1988, the governor of California signed into law a bill granting alternatives to students in elementary and secondary schools who are ethically opposed to dissection. Jenifer's refusal to dissect—and her refusal to be denied alternatives to dissection—set an important precedent encouraging other states and school districts to

adopt policies that recognize and protect students' right not to dissect.

For other examples of what teens have accomplished in the areas of humane education and animal protection, visit **www.humaneteen.org**.

The Law on Your Side

Like California's choice-in-dissection policy, many state and local bills—sponsored by legislators and eventually adopted as laws—have grown out of one individual's recognition of a problem and willingness to bring it to public attention. As another example, the federal Protection of Pets law traces its roots to a Kentucky senator's concern about cats and dogs in his state being stolen for use in research.

Word Processing

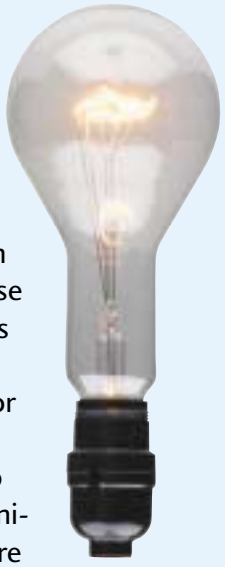
■ In 1996, the USDA held a symposium to celebrate the anniversary of the Animal Welfare Act. Representatives from government, industry, and humane organizations who attended offered their views on what the Act had accomplished and what direction it should take in the future.

Barbara Rich, executive vice president of the National Association for Biomedical Research (NABR), had this to say about animal welfare laws: **"Once the bill is passed and the legislation is signed, we want to stand behind every letter of the Animal Welfare regulations. Our research community wants to live up to our animal welfare standards. We want to do that not just because it is the law, but because it is right, because excellence in science depends on it, and because the public demands it."**

In its mission statement, the NABR—which represents more than 350 public and private universities, medical and veterinary schools, teaching hospitals, pharmaceutical companies, and other animal research-related groups—advocates for the humane treatment of animals, the use of fewer animals whenever possible, and the development of alternatives to animal use in research. However, the organization has **opposed** several amendments that animal protection groups wanted—amendments that would strengthen the AWA, for example, by prohibiting the sale, purchase, and use of stolen animals in research or by protecting mice, rats, and birds. In a hearing to decide whether The Family Pet Protection Act and the Pet Theft Act should become laws, NABR representatives, some of whom use the services of Class B dealers or conduct research on mice or rats, testified against both bills.

What do you think are some of the concerns the NABR has about stricter regulations covering mice, rats, and companion animals? How would you address those concerns? How would you persuade NABR members that such regulations could benefit their work?

■ Turn to the resources at the back of this book. Choose two organizations from those whose Internet sites are listed—one primarily dedicated to animal welfare advocacy and one that primarily promotes scientific research. Write to them or visit their Web sites to determine their mission statements. As you review their statements, keep in mind the following: An estimated 20-30% of current research experiments cause pain or distress in animals. Some research is conducted on animals because no suitable alternatives have been developed or approved. Animal research can provide useful information on human and animal health.



What, if anything, do the two groups say or do to address those issues? For example, if a group believes in immediately abolishing animal use, how do they propose to replace research that currently depends on the use of animals? Do the organization's actions, such as their legislative record, educational campaigns, or use of funding, support their claims? For example, if the group supports replacing some or all animal use with alternatives, what are they doing to help make that possible?

Around the same time Jenifer Graham waged her fight for alternatives to dissection, Senator Wendell Ford introduced the Pet Theft Act in a House of Representatives hearing. It would have prohibited Class B dealers from obtaining animals from auctions, ads, or any sources other than shelters already under contract to release them for research. The bill proposed strict requirements for documenting dealer purchases and sales. It also called for shelters to keep animals for longer holding periods, to give pet owners a chance to reclaim their lost pets and to prevent dealers from "raiding" facilities as soon as animals arrived.

Although Senator Ford's bill passed the Senate unanimously, some research associations campaigned against it in the House hearing. Ford's bill died in the House in 1989, but it paved the way for similar legislation, known as Protection of Pets, which was added to the AWA in 1992.

Getting Our Act Together

The Animal Welfare Act has, in fact, evolved from a series of events and initiatives—involving lobbying groups, consumer campaigns, individual activists, and the media—that have generated public awareness and pressure to strengthen the law. The following examples illustrate the relationship between key events and legislative activity that form a kind of timeline for the AWA.

■ In 1965, a hospitalized pet owner saw a snapshot of his dog, Pepper, in a newspaper. Pepper was one of 18 dogs relinquished by a local humane society to an animal dealer. The dealer falsely claimed he had given Pepper to another dealer, out of state, when in fact he had sold the dog to a research hospital. By the time her family tracked down their missing pet, Pepper had been experimented on and killed.

Pepper's story was widely reported and followed the next year by an article titled "Concentration Camps for Dogs," published in *Life*, one of the most popular magazines of the time. The article, which included a photo of a starving dog, showed millions of Americans that animals sold to research laboratories could be very badly treated by animal dealers. This story generated tremendous public outrage, and copies of the magazine were put in the hands of every member of Congress that year. In the summer of 1966, Congress passed the Laboratory Animal Welfare Act.

■ In the summer of 1981, Alex Pacheco, a 23-year-old college student and animal activist volunteered at a physiology laboratory in Silver Spring, Maryland. In the course of his work, he developed a case against the facility's director for mistreatment of monkeys used in his research. The case led to a police raid of the facility, the first such in American history. It also marked the first time a researcher in the U.S. would be charged with cruelty to animals in a laboratory. The story of the Silver Spring monkeys was carried on the front page of *The Washington Post* and made headlines across the country. Congress held hearings at which representatives of both the NIH and the USDA were grilled. Several bills were introduced but did not make much progress.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■ In 1984, allegations of laboratory animal abuse were again widely publicized when stolen videos of baboon research, originally taped by scientists, were distributed to the media and discussed on television. The experiments, conducted at the University of Pennsylvania, were designed to produce whiplash-like damage to baboons' brains and spinal cords, then assess the resulting damage and the animals' behavior. The dramatic footage raised serious questions about animal care standards in the laboratory—and about the scientific merits of certain research. Public outcry and pressure led to several important amendments to the Animal Welfare Act in 1985, termed "Improved Standards for Animals." They also led to changes in the Public Health Service policy on animal research. (The Public Health Service is a division of the U.S. government that includes several agencies, such as the NIH, responsible for disease control, research, and health education.)

The way that the AWA has evolved reveals the significant role that the public—as well as the media—plays in the legislative process. New

laws are frequently precipitated by reports of activities the public perceives as especially troubling: pet theft, poor treatment of animals, painful experiments with questionable benefits for humans or other animals. As the public's conscience and awareness have expanded, so have the provisions of the law.

The history of the AWA, then, mirrors changes in mainstream thinking and the moral views of society, including a growing interest in research practices and concern about animal welfare. The AWA also strongly reflects the thinking of the animal research community. Much of the newest legislative activity, for example, stems from scientific interest in alternatives.

Think About It

The AWA calls for researchers to use alternatives to animals, when possible, in experiments that cause pain or distress. What might be some valid reasons for using animals instead of alternatives? What might be some other reasons for not choosing alternatives?

Questions and Issues for Discussion

Since its passage in 1966, the Animal Welfare Act has been amended, on average, every six years. What amendments to the Act would you like to see in the next year or two? In the next decade?

Explore the Issues

• Animal dissection was banned from schools in Argentina in 1987 and in Slovakia in 1994. In 1993, a law took effect in Italy recognizing the right of conscientious objectors to refuse to participate in animal experimentation. In 2002, the European Union announced a ban on the testing of final cosmetic products and their ingredients on animals, starting in 2009. What other laws regarding animals in education and research are in place in other countries? Check www.frame.org.uk.

• Since Massachusetts passed the first animal cruelty law in 1835, every state has passed laws that protect animals to some extent. Every state also has its own humane groups and organizations, both local and national in scope, that help propose new and amended legislation to improve existing laws. Find out what the laws are in your town or state. Your local librarian or law library can help you obtain information about or copies of federal and state laws. In addition, the National Anti-Vivisection Society maintains a website, AnimalLaw.com, with current information on animal-related laws. The site offers analysis and updates on federal and state laws and highlights of court decisions affecting animal issues. It also provides "model" laws on pound seizure, dissection, and anti-cruelty issues, which may be particularly useful to activists at the local level.

Take Action

• Would you like to stop pound seizure in your state? Visit www.banpoundseizure.com for information and activities.

• Protect your pets against becoming lost or stolen. Walk them on leashes or keep them safely confined, as in a fenced yard or indoors. Also, be sure your cats and dogs wear collars with identification tags so that they have a better chance of being returned home if they do become lost.

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• Urge the USDA to define "distress," to develop guidelines for research causing distress or pain, and to adopt and strictly enforce regulations to improve conditions for all animals in laboratories. Specifically ask that the Animal Welfare Act include provisions for the humane treatment of mice, rats, birds, and all vertebrate animals. E-mail your comments and requests to awic@nal.usda.gov.

• Help the schools in your district become animal-friendly. Circulate a petition against animal use in classroom experimentation or science fairs. Urge schools to adopt a policy that would replace dissection with humane alternatives or give students the right to choose humane options. A dissection campaign packet for students may be ordered by e-mailing ari@hsus.org or writing to The HSUS.

Stay Informed and Involved

Because the laws of a democracy are developed and changed to keep pace with society's

changing attitudes, significant progress on behalf of animals can be made using one of our most basic social institutions—our legal system. In a democracy, ordinary citizens decide how they will govern and be governed and how to solve problems in their country, states, cities, and schools.

The democratic process allows people to introduce new laws, change existing ones, and abolish those they consider unjust. It allows them to participate in referendums, where they can vote on legislative matters. Through the democratic process, an informed public can advance causes that its members generally agree on, such as the humane treatment of animals, by lending their voice in support of animal protection laws at the federal, state, and local levels. For that reason, it's important to stay informed about pending legislation and about animal research activity, including the development of alternatives, and to share that information with others. Following is a list of resources, representing different views and interests, that can help you become more knowledgeable about the facts and issues at the heart of the debate.

Think About It

- What were your views on animal experimentation before you read this booklet? Have any of your views changed? If so, how and why?
- In your opinion, what are the central issues in the animal experimentation debate? How do you believe those issues can best be resolved? How can you be a part of that process?
- Send us your ideas on the issues. Write to us at The HSUS, Youth Education Affiliate, 67 Norwich Essex Turnpike, East Haddam, CT 06423-1736, or e-mail **humaneteen@nahee.org**.

RESOURCES

E-MAIL

Animal Research & Analysis. A free E-newsletter that provides up-to-date news stories and interpretive analyses concerning the use of animals in research, testing, and education. To subscribe, e-mail ari@hsus.org. Include the words, "Subscribe-Animal research News" in the subject line with your first and last name in the body of the message.

HUMANElines. This free, weekly e-mail alert keeps you posted on significant events affecting animals. Find out when federal legislation reaches a critical stage and needs your attention or when agencies like the USDA are asking for public comments on important animal issues. To subscribe, send the message "subscribe hsus-action" to humanelines@hsus.org.

HumaneTeen Network. Free e-mail updates of ways you can help animals. Sign up at www.humaneteen.org. Click on "Join the Network".

INTERNET SITES

Alternatives Research & Development Foundation, www.ardf-online.org

American Association for Laboratory Animal Science, www.aalas.org

American Medical Association, www.ama-assn.org

American Society of Laboratory Animal Practitioners, www.aslap.org

American Society for the Prevention of Cruelty to Animals, www.aspca.org

Animal Welfare Institute, www.animalwelfare.com

AnimalConcerns.org, www.animalconcerns.org

Center for Alternatives to Animal Testing at Johns Hopkins University, caat.jhsph.edu

Ethical Science and Education Coalition, www.neavs.org/esec.htm

Foundation for Biomedical Research, www.fbresearch.org

The Humane Society of the United States, www.hsus.org

Institute for Laboratory Animal Research, dels.nas.edu/ilar

Institutional Animal Care and Use Committee, www.iacuc.org

Lab Animal, www.labanimal.com

National Anti-Vivisection Society, www.navs.org

National Association for Biomedical Research, www.nabr.org

People for the Ethical Treatment of Animals, www.peta-online.org

Physicians Committee for Responsible Medicine, www.pcrm.org

Psychologists for the Ethical Treatment of Animals, www.psyeta.org

Scientists Center for Animal Welfare, www.scaw.com

World Week for Animals in Laboratories, www.wwail.org

BOOKS AND JOURNALS

42 Ways to Help Animals in Laboratories (HSUS, 1999).

Animal Experimentation: Cruelty or Science? by Nancy Day (Hillside, NJ: Enslow Publishers, Inc., 1994).

Animal Models of Human Psychology: Critique of Science, Ethics and Policy, by Ken Shapiro (Seattle: Hogrefe & Huber Publishers, Inc., 1998).

The Animal Research Controversy: Protest, Process & Public Policy, by Andrew N. Rowan, Ph.D., and Franklin M. Loew, D.V.M., Ph.D. (Tufts University School of Veterinary Medicine, 1995).

Animals in Education: The Facts, Issues and Implications, by Lisa Ann Hepner (Albuquerque: Richmond Publishers, 1994).

Animals and Their Legal Rights (Animal Welfare Institute, 1990).

Biotechnology Unzipped, by Eric S. Grace (Washington, DC: Joseph Henry Press, 1997).

Comfortable Quarters for Laboratory Animals (Animal Welfare Institute, 1998).

Man and Mouse: Animals in Medical Research, by William Paton (New York: Oxford University Press, 1993).

Overview of the Issues (HSUS). Available online at www.hsus.org.

Principles and Guidelines for the Use of Animals in Precollege Education, by the Institute for Laboratory Animal Research (Washington, DC: National Academy Press, 1989). Free. E-mail ILAR@nas.edu.

The Scalpel and the Butterfly: The Conflict Between Animal Research and Animal Protection, by Deborah Rudacille (California: University of California Press, 2001).

Specious Science: How Genetics and Evolution Reveal Why Medical Research on Animals Harms Humans, by Jean Swingle (New York: Continuum Publishing Group, 2002).

Scientific American, www.scientificamerican.com

The Use of Animals in Higher Education: Problems, Alternatives, & Recommendations, by Jonathan Balcombe, Ph.D. (Washington, DC: Humane Society Press, 2000).

Use of Laboratory Animals in Biomedical and Behavioral Research, by the Commission on Life Sciences (Washington, DC: National Academy Press, 1988).

Vivisection and Dissection in the Classroom: A Guide to Conscientious Objection, by Gary L. Francione and Anna E. Charlton (American Anti-Vivisection Society, 1992).

www.humaneteen.org

An Animal Protection Site for Students

What are the latest campaigns, trends, and resources in animal protection? How can you contribute your voice to the issues? What are other teens doing to help animals in their communities?

The answers to these and other questions are right at your fingertips, at www.humaneteen.org. Maintained by The HSUS Youth Education Affiliate, this site provides:

☑ contests, campaigns, crime-solving opportunities, and other quick ways you can get involved and make a difference for animals

☑ tips for starting your own animal protection club

☑ articles about student clubs and teen activists who are leaders in helping animals

☑ teens' thoughts and opinions

☑ our guide to the most current animal protection/environmental websites

☑ information on everything from videos and books to petitions and summer camps

☑ resources to help you spread the word about respect and compassion for animals

☑ message boards where you can chat with other teens about animal issues

☑ a monthly survey of teens' opinions on animal protection issues—cast your vote and see how many people agree with you

☑ study guides about important topics like animal cruelty, hunting, and factory farming—fact-packed and perfect for school reports

☑ our annual award recognizes a teen who's made a significant contribution to animal protection

☑ step-by-step projects you can undertake on your own or with a student club

☑ free e-mail updates

Teach Kids to Care About Animals

From greyhound racing and circuses to puppy mills, dogfighting, and mistreatment of companion animals, animal suffering is all too common in our society. Yet so many of the causes of animal abuse can be reduced through **humane education**, which teaches children how to make better choices for animals. You or your animal protection club can reach elementary-school kids through NAHEE's Adopt-a-Classroom program. When you adopt a class, each child in that classroom receives his or her own copy of *KIND* (Kids In Nature's Defense) *News*, an award-winning newspaper for kids. It features articles, puzzles, projects, and celebrity interviews that teach children compassion and respect for people, animals, and the environment.

A subscription to *KIND News* costs just $30 and includes 32 copies of the newspaper and a teacher's guide, September through May. Your adopted classroom's teacher will also receive *KIND Teacher*, a book of fun, reproducible worksheets, plus KIND ID cards for students, a classroom poster, and a KIND Calendar for the whole school year. Through our Adopt-a-Classroom program, you can provide a subscription to *KIND News* as a gift for a child or teacher.

To learn more, please visit **www.nahee.org**. To view samples of *KIND News*, go to **www.kindnews.org** and click "About *KIND News*."

KIND News Order Form

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- ❑ Primary Edition (grades K-2)
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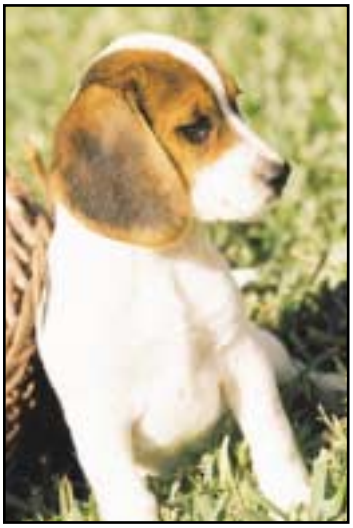
Please mail this form to: *KIND News*, 67 Norwich Essex Turnpike, East Haddam, CT 06423-1736. Make checks payable to *KIND News*.

Notes

How Else Can You Make a Difference for Animals?



Become a member of The Humane Society of the United States, the nation's largest animal protection organization. Membership costs $25 per year.

By joining The HSUS, you can stay on top of pending laws, issues, and progress in animal protection and environmental matters. As a member, you'll receive *All Animals*, a quarterly magazine that will keep you posted on a variety of animal-related news. You can also be a part of the Action Alert Team (at no extra cost!) and receive *Humane Activist*, a bimonthly publication for grassroots activists.

To become a member of The HSUS, fill out the form on the right and send it with a check for $25 made payable to The HSUS, 2100 L St. NW, Washington, DC 20037.

HSUS Membership Application

❑ Yes, I wish to become a member of The Humane Society of the United States and receive *All Animals*. My $25 is enclosed.

❑ Yes, I also want to join the Action Alert Team, at no additional cost, and receive *Humane Activist*. Send me the next issues as soon as possible! (You must join The HSUS in order to sign up for the Action Alert Team.)

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