

## **Animal Welfare Case Studies**

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Required reading to refine your thinking about the issues presented in the following case studies are from the Scientific American Forum on the Benefits and Ethics of Animal Research.

- Barnard, N.D. and S.R. Kaufman. 1997. Animal research is wasteful and misleading. *Sci. Amer.* February, pp. 80-82.
- Botting, J. H. and A.R. Morrison. 1997. Animal research is vital to medicine. *Sci. Amer.* February, pp. 83-85.
- Mukerjee, M. 1997. Trends in animal research. *Sci. Amer.* February, pp. 86-93.

### **1. The Cornell Cats.**

An animal protection group learns through information obtained under the Freedom of Information Act guidelines that the National Institute of Mental Health (NIMH) has just funded a pharmacology project at the Cornell University Medical College to study drug addiction in cats. Protests are planned to publicize this waste of public money on obviously "barbaric" research. Some mental health professionals reviewed the literature and decided that there was no clinically useful information that has ever come from this lab, or labs doing similar work.

The principal research investigator was invited to apply for this grant because she has done similar work in the past. She developed a study system where she surgically implants recording electrodes into cats' brains. When the cats awaken from anesthesia, they are wearing plastic bonnets glued to their skulls that allow the researchers to record the cats' brain waves. Cats are then addicted to various drugs, and their brain waves and behavior are studied when the drugs are discontinued. In the early days of this work, cats went through severe withdrawal reactions. When it was found that the earliest sign of withdrawal illness was a mildly disturbed brain wave pattern during sleep, the study protocol was modified so that it ended earlier. The current project to be funded proposes to examine a variety of "non-addicting" sedatives sold for human use, to investigate whether they are truly non-addicting. Cats that begin to show signs of withdrawal illness will be euthanized as soon as it is obvious that they are addicted (based on sleeping brain wave patterns). Government inspectors have never found violations upon inspecting her lab for proper experimental animal protocols.

Because of the severe negative publicity, the researcher returned the grant, and will shift her work to rats. This will require repeating the early stages of describing the severe withdrawal reactions before she can define early, subtle patterns in the rats' brain waves that indicate addiction. Some mental health experts bemoan the loss and delay of this valuable information.

#### **Issues:**

- 1) How do we decide if this project is a waste of cats' lives and taxpayers' dollars when the experts cannot agree?
- 2) Can animal models of complex human problems such as drug addiction ever be of use?
- 3) Is painful or distressing research more acceptable if we switch from cats to rats? Or frogs? Or invertebrates?
- 4) Do you trust government inspections of government-funded projects to be objective and reliable?
- 5) If a project is painful or causes distress to animals, does euthanasia during the early stages of pain make things any better, i.e. is killing animals better or worse than hurting them?

## 2. Chimps with AIDS

Human Immunodeficiency Virus (AIDS) is well known as one of the premier health crises of our time. The classic approach to the study of infectious disease is to infect a non-human animal, study the course of the disease in this 'model' and, once its 'natural' course has been well defined, use this model to develop vaccines and treatments. When the HIV virus was first discovered, there was a flurry of activity to find a non-human animal that could be infected and that might develop a similar disease. Early efforts in dogs, monkeys and rodents were unsuccessful. Some human viruses, for example, Hepatitis B, will only grow in humans and their closest relative, the chimpanzee. Interestingly, Hep B does not make the chimps sick, so they can be used to screen vaccines without even exposing them to ill health. So it is a logical next step to try to infect chimps.

Proponents hope that chimps will successfully incubate the virus. If they get sick from it, it will help us study the basic viral biology, and to investigate different treatment possibilities. If they do not get sick, they can still be used to investigate techniques, especially vaccines, to block infection from occurring. If they do get seriously ill, they could be humanely euthanized once we've fully defined the course of the uninterrupted illness in this species. If they never get ill, they might always be carriers for human infection, but they could live out their lives in comfort in captivity, possibly even breeding more chimps for research (assuming minimal chimp-to-chimp transmission).

Opponents say that chimps are too fully human in too many ways to subject them to this devastating disease. Some argue that this infection is a disease of human vice, making it particularly immoral to infect innocent animals. Furthermore, chimps are an endangered species, and their numbers would quickly be depleted by this use, despite captive-breeding programs. Some opponents are against any animal experimentation, while others point out that similar viruses of sheep, monkeys and cats are sufficient in enough relevant ways to serve as better natural models.

Some facts, as far as I know them are that: 1) A few chimps have been infected, but none have yet gotten sick. However, the incubation period in humans can be over a decade from infection to the onset of illness. Perhaps they are a perfect replica? 2) Most of the important work to date has been done with cells and viruses in *vitro*, not whole animal studies.

### Issues:

- 1) If chimps were not an endangered species, would their similarity to humans give them special status?
- 2) If chimps were not so human-like, should their endangered species status make them exempt from research projects?
- 3) Is AIDS a disease of human vice (How about alcoholism or cigarette-related respiratory conditions or gunshot?) If it does make sense to class diseases as problems of human vice, should we spare animals from involvement in research on such diseases?
- 4) With all the sophisticated cell biology that allows us to study cell-virus interactions directly, are animal studies obsolete?
- 5) Do we owe anything special to animals that have been 'retired' from such research? Keeping a chimp in comfort through its retirement could cost well over \$20,000 a year.

### 3. Vet student "junior surgery"

During their third year of vet school, just before they start seeing clients' animals as fourth year students, vet students spend a semester practicing surgery on laboratory dogs. A major surgery is performed, and the dogs recover for one week, then they are anesthetized for a very major procedure (e.g. a bone may be broken and reset). The animals are killed at the end of the lab, before they would awaken from anesthesia. Some vet schools do no survival surgery at this time to spare the animals any pain. The old system at Cornell was to use one dog through a dozen weekly surgeries and euthanize her if she were seriously ill, or at the end of the course. Human medical students do not practice surgery on animals at most med schools, and they certainly do not practice on human patients that do not require surgery. Vet students in Great Britain do not practice surgeries on lab animals, instead they apprentice to an experienced vet when they graduate.

Proponents of surgical training procedure point out that: 1) unlike medical students, vet students will be licensed to conduct surgery as soon as they graduate, without required internships or residencies, so they must learn techniques while at school, 2) unlike medical students, vet students would practice on their 'target species'. Every step in learning dog surgery in the lab is directly applicable to their future work; no need to extrapolate from dog to human, 3) it would be unethical for students to do their first surgeries on people's loved pets, 4) post-operative care is a vital part of surgical practice and should be part of the initial surgical training, and finally, 5) there is nothing like a living, breathing, bleeding patient to practice all aspects of anesthesia, surgery, and post-operative recovery.

Opponents say that this is barbaric: 1) Students should do their first surgeries on models, or on dogs that have died or been killed for other reasons, gradually moving on to terminally ill patients donated by their owners to the college. 2) Dogs should not be expected to recover from a clumsily performed first surgery, which is certainly going to have more post-operative pain than surgery performed by a speedy, skilled experienced surgeon. Students should gradually acquire skills by assisting in necessary surgeries performed for the animal's benefit.

Some students said they would rather abort their careers than to harm any more animals in pursuit of their education. Some teachers and practicing veterinarians say that students must learn to face some harsh realities, that they must do all in their power to be fully competent before they are unleashed on the pet-owning public, and that if they cannot bring themselves to kill a handful of dogs in pursuit of this competence, maybe they should get out of vet school.

#### Issues:

- 1) How much of this is an issue of student freedom of choice and autonomy, and not an animal issue at all?
- 2) Logistics: A class of 80 needs a lot of practice dogs in a short period of time to learn surgery. How could we rely on hit-by-car deceased dogs to provide enough practice material without extending-the length of the veterinary education?
- 3) Are laboratory dogs being considered some sort of second-class citizen compared to owned and loved pet dogs, that we would use on the one and not the other? Is this appropriate?
- 4) Is it better to do a lot of surgery on a few practice dogs, or one surgery each on several practice dogs?

#### 4. The Baboon and the Liver

In 1992 a baboon was killed as the source of a liver for transplantation to a person in chronic liver failure, despite public outcry from animal rights advocates. The human recipient lived for 10 weeks before dying of a brain hemorrhage, thought to be unrelated to the transplantation.

Baboons are highly intelligent, social creatures. They are not endangered or threatened species, and are killed as agricultural pests in parts of Africa. They are bred in small numbers in the southern United States for research.

Baboons are attractive as organ donors for their size, the fact that they can be screened for infections that could be passed to the human recipient, and the fact that they (and presumably, their transplanted livers) will not acquire infections with the human hepatitis viruses that often lead to chronic liver failure in human patients. Other species (primates or otherwise) may prove preferable for some other organs, especially for tiny human infants.

It is possible that in the future, farmed baboons (or other donor species) could be genetically or otherwise manipulated to make animal-to-human transplants safer and less prone to graft rejection than human-to-human transplants. Obviously, timing would be simpler than waiting for an appropriate human donor to die of natural or accidental causes.

What criteria are most important to you in deciding whether attempts at animal-to-human transplantation should be continued? What criteria would need to be met to make you allow this?

Wild & endangered vs. domestic or sustainable captive breeding colony.

Whether other body parts would simultaneously be harvested for food/transplants.

"Position" of the donor species on the "evolutionary scale," or traits such as intelligence, sociability, size.

Are there people who should not qualify to be the beneficiaries of such a program, such as:

- Individuals who are very old, or for whom the operation is highly unlikely to succeed
- People (such as smokers, IV drug users, careless drivers, etc.) who may have brought their condition upon themselves?

How does the fact that no one knew how successful this would be affect your decision on whether or not you would allow it?

Is there any real difference between using primates for basic research and using them as organ donors?