

## One Welfare Article

### Animal Use in Research

On a Friday afternoon last July while on my way to pick up my daughter from daycare, I was enjoying my weekly geek-out time of Science Friday on NPR. The discussion with Dr. Hasam Alam addressed the use of swine in biomedical research, specifically models of uncontrolled hemorrhage and induced hypothermia to revive trauma patients (<http://www.sciencefriday.com/segment/07/11/2014/could-inducing-hypothermia-help-revive-trauma-patients.html>). The medical success (both in research and clinical settings) that has been documented with the fine-tuning of this technique was mind-boggling and encouraging – no one really plans for life-threatening, traumatic hemorrhage events in their day, but it is good to know that you have a fighting chance in the hands of a trauma team. I also found the tenderness with which Dr. Alam spoke of the study animals, pigs, equally inspiring. It is this attitude of appreciation and gratitude towards research animals that is often missed by critics of the use of animals in research.

Simply put, we must use live animals in research for a variety of reasons. Federal regulations (9CFR, FD&C A) require it for the approval of new drugs, treatments and medical devices. It would be highly unethical to test anything with unknown safety, efficacy, toxicity, etc. directly in humans. Enter purpose-bred research animals, the vast majority of which are rats and mice accounting for 95% of the vertebrates used in research. (Fessenden 2014) Other species utilized range from rabbits and guinea pigs to agricultural animals to a few non-human primates. (Kehinde 2013) Depending on the species involved, the purpose of the research (biomedical vs. agricultural), and the source of funding (ex: NIH vs. private), there are a host of laws, regulations and expectations that govern everything from animal procurement to housing to humane euthanasia. (USDA Animal Welfare Act, The ILAR Guide, Ag Guide, AVMA) The goal of this article is not to summarize the regulatory aspects of *in vivo* research, (i.e. the listed citations provide those resources) but to challenge some views and common (mis)perceptions surrounding the use of animals in research. Additionally, I do not support the use of research animals to test cosmetics, and there is no further discussion on this topic here – if vanity is that important to you, you can use your own eyes and skin to maximize the volume of your eyelashes and reduce the appearance of fine lines, wrinkles and age spots.

There is a global movement within the realm of *in vivo* research to incorporate the 3Rs – reduce, refine, replace. (<http://www.nc3rs.org.uk/>, Festing and Wilkinson 2007) Reduce the numbers of animals used in studies to the minimum needed to obtain statistically significant results. Refine experimental techniques to minimize pain and distress. Replace *in vivo* experiments with *in vitro* or *in silico* methods wherever possible and appropriate. Current research surrounding the 3Rs is astounding! However, implementation of the 3Rs is not enforced by the regulatory agencies; it is voluntary. The traction this movement has gained is due in large part to the increase in the validity of results obtained – because better welfare decreases variability and because it's the right thing to do for the study animals both ethically and scientifically.

So now on to the ‘elephant in the room’....euthanasia of study animals. Yes, the majority of research animals are euthanized. While one could argue that “*most of these are rodents so who cares?*” I tell you that I care, anyone who took the veterinarian’s oath cares, and the public cares. Luckily, we have a wealth of information and resources available to prevent unnecessary suffering and guide us in providing timely and humane euthanasia. Humane euthanasia is an important part of *in vivo* research; clinical signs can only tell you so much about safety, efficacy, toxicity, etc. We need tissue samples and necropsy findings to complete the picture for new drugs, therapies and devices.

The good news is that when death is not required by study design, other options exist such as adoption, transfer of ownership, sale (ex: livestock), or return to colony. What is important to remember when considering these options is that no one alternative is appropriate for every research animal. Genetically engineered animals (ex: GEM mice) should remain in research settings. Animals with treatable/contagious/infectious diseases must be confirmed disease-free before leaving the research environment (ex: heartworm positive dogs). If the condition cannot be resolved or managed, then the animal is not a good candidate for placement elsewhere. Even for healthy cats and dogs, not every potentially adoptable animal is a good candidate for adoption. It can be really difficult for some people to reconcile with this idea. There are, for example, research beagles that are exceptionally timid, have never been exposed to normal household noises, children, stairs, etc. and are near impossible to house train. The adoptability of that dog versus one who is gregarious with a more adaptable personality is clear. If there is the possibility for a successful adoption, research facilities should work to socialize and habituate the animals to life outside of a research setting. Another variable when considering adoption is the person/group adopting the animals. Every adoption of a research animal places that research organization at risk for negative publicity and slandering if the wrong people have the animal. The Beagle Freedom Project is a prime example of this – it is led by animal rights extremists who see the dogs as instruments to use to gain media exposure for their anti-research messages. But this is not a reason to not permit adoption of research animals, just a constant reminder to be diligent and cautious. Dr. Larry Carbone said it best in an AWIC Newsletter, “If we defend animal research by claiming that we only use, harm, or kill research animals when necessary, then it follows that we will want to do our best to ensure good lives for those animals whose sacrifice is not required by our science.” (Carbone 1996)

In the end, research involving live animals is required by law. Additionally, humane treatment of the animals and ensuring good welfare is required by law, by public demand and by the policies of research organizations. For as long as we have unmet medical needs, there will be a need for responsible use of animals in research. The following are some of the reputable organizations supporting the responsible use of animals in research:

AAALAC International – Association for assessment and accreditation of laboratory animal care  
<http://aaalac.org/>

ASLAP – American Society of Laboratory Animal Practitioners <http://www.aslap.org/>

AALAS – American Association for Laboratory Animal Science <https://www.aalas.org/>

ACLAM – American College of Laboratory Animal Medicine <http://www.aclam.org/>

Americans for Medical Progress <http://www.amprogress.org/>

**Citations:**

Ag Guide: Guide for Care and Use of Agricultural Animals in Research and Teaching 2010 - [www.fass.org/docs/agguide3rd/Ag\\_Guide\\_3rd\\_ed.pdf](http://www.fass.org/docs/agguide3rd/Ag_Guide_3rd_ed.pdf)

AVMA Euthanasia Guidelines - <https://www.avma.org/KB/Policies/Documents/euthanasia.pdf>

Carbone, L. Adoption of Research Animals. Animal Welfare Information Center Newsletter, Winter 1996/1997, Vol. 7 No. 3-4

9 CFR: Code of Federal Regulation, Animals and Animal Products - [http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title09/9tab\\_02.tpl](http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title09/9tab_02.tpl)

FD&C A: Food Drug and Cosmetic Act - <http://www.fda.gov/RegulatoryInformation/Legislation/FederalFoodDrugandCosmeticActFDCA/default.htm>

Fessenden, M. Mouse traps: How to avoid pitfalls in assays of mouse behavior. The Scientist, November 1, 2014. <http://www.the-scientist.com/?articles.view/articleNo/41269/title/Mouse-Traps/>

Festing, S and R. Wilkinson. The ethics of animal research. EBMO Reports 2007; Vol 8, No 6: 526-530

Kehinde, E.O. They see a rat, we see a cure for diseases: The current status of animal experimentation in medical practice. *Med Princ Pract* 2013; 22 (suppl 1): 52-61

The Guide: Guide for Care and Use of Laboratory Animals, 8<sup>th</sup> edition 2011 - <http://grants.nih.gov/grants/olaw/Guide-for-the-care-and-use-of-laboratory-animals.pdf>

USDA AWA: United States Department of Agriculture Animal Welfare Act - <http://awic.nal.usda.gov/government-and-professional-resources/federal-laws/animal-welfare-act>