Ethically sourced animal cadavers and tissue: Considerations for education and training

Siri Martinsen[1] and Nick Jukes[2]

[1]InterNICHE Norway, [2]InterNICHE, Leicester, England

Corresponding author: Siri Martinsen
InterNICHE Norway
c/o NOAH, Osterhausgt. 12, 0183 Oslo, Norway
siri.martinsen@bredband.net

Abstract
This paper describes 'ethically sourced' animal cadavers and tissue, as defined by the InterNICHE Policy, and addresses the importance of using cadavers and tissue only from these sources when material is needed for the purpose of education and training. The attitudes developed by students and trainees using ethically sourced material and conventional sources are compared and discussed. Examples are given where the use of ethically sourced cadavers and tissue has been successfully implemented in practical classes for anatomy and surgery. Potential use for research and testing purposes is also briefly discussed. The paper outlines the potential practical problems of such cadaver use and offers examples of how they may be overcome. The impact on veterinary colleges and society of 'client donation programs' for sourcing animal cadavers is also addressed.

Keywords: InterNICHE, ethically sourced, alternatives, education, cadaver

Introduction

Until recently dissections and other uses of animal bodies within education have been synonymous with the killing of animals for such uses. InterNICHE has continuously challenged the assumption that the need for animal bodies and tissue means a need to kill the animals whose bodies are used. Building on the tradition within human medicine where donated human bodies of deceased individuals are used for teaching within a fully ethical and responsible framework, InterNICHE promotes the development of a tradition within life science education for the use of ethically sourced animal cadavers and tissue only.

Definition of 'ethically sourced'

The term 'ethically-sourced' is defined within the InterNICHE 'Policy on the Use of Animals and Alternatives in Education' (Jukes and Chiuia, 2003) and refers to animal cadavers and tissue obtained from animals that have died naturally or in accidents, or who have been euthanised secondary to natural terminal disease or non-recoverable injury. Animals that have been captured, bought, bred, kept, harmed or killed to provide cadavers and tissue are not considered ethically sourced. The policy also states that the animal must have been wild, stray or a companion animal – obtaining cadavers and tissue from places where animals are bred to be killed are seen to compromise the ethical nature of the ethical sourcing and are thus not considered ideal.

The Policy includes use of animals from some of these sources if animals are hard to source ethically. However the same strict rules apply here: They must have died naturally or in accidents, or have been euthanised secondary to natural terminal disease or non-recoverable injury - and the cadaver or tissue is destined for disposal. The term 'destined for disposal' refers to true waste that is of no economic value – it does not refer to 'surplus animals' because the practice of defining individual animals as surplus is in itself considered unethical and the use of surplus animals risks creating a market for use of these animals.

The following examples of sourcing and use of animal cadavers and tissue further illustrate the Policy's definition:

• *Surgical dissection by veterinary students of companion animal cat and dog cadavers sourced from a veterinary teaching hospital*: If the animals died from natural causes or in accidents, or were euthanised because of non-recoverable injury, then the cadavers are ethically sourced and such use is acceptable. Dogs killed in shelters due to inability to rehome them are not ethically sourced – such use facilitates the killing of healthy animals and does not

meet the definition of 'true waste'.

• *Mitochondria from the livers of rats sourced from research laboratories*: As the animals are laboratory animals and not wild, stray, or companion animals, and moreover were killed rather than euthanised**,** then the tissue is not ethically sourced and such use is not acceptable. Tissue from companion animal rats is ethically sourced if all conditions are met.

• *Use of a dairy cow euthanised because of non-recoverable leg injury:* This use may meet the Policy's criteria for acceptable use from other sources, but is not ethically sourced, as she is used by an industry that breeds animals for killing. Likewise the kidneys from pigs slaughtered for meat may be acceptable within the Policy as long as they constitute 'true waste' and do not constitute a niche of income for the slaughterhouse. If, however, a slaughterhouse sells kidneys for dissections, this is not acceptable, because the dissections will then be part of the reason why the animal was killed.

The importance of using ethically sourced animal cadavers

The obvious reason for not killing animals for education is that animals matter – their lives matter and their well-being matters. Breeding and catching animals for the purpose of killing them for education inflict harm on them in different ways – stress, fear, pain, denial of natural behaviour, denial of social behaviour, breaking of social bonds all cause suffering to animals (Bekoff, 2007). The killing in itself is also defined as harm by the InterNICHE Policy as it impinges on an animal's current and future well-being. Ethological data on emotions and cognition in animals suggest that pleasure, expectations of pleasure and conscious planning are very much part of animals' lives (Bekoff, 2007; Balcombe, 2006). This contradicts the notion that animals are not suffering a loss by being killed. Animals' right to life has also been elaborated by philosophers (Regan, 1983), and thereby also the importance of not taking this life away from them for human purposes.

Moreover, as increasing awareness of animal welfare, animals' needs and animal ethics emerges in society, the demand for life science students to be aware of these issues increases (de Boo and Knight, 2005).

When ethically sourced animal cadavers and tissue are used, students that respect animals' lives are not faced with a learning environment that conflicts with their conscience, and the learning environment is not disturbed by the fact that a moral conflict underlies the teaching. Moreover, students are not to subjected to the possible desensitisation that the use of killed animals may cause (Capaldo, 2004; Balcombe, 2000).

Implemented use of ethically sourced cadavers and tissue

The use of animal cadavers and tissue in accordance with the InterNICHE Policy is already taking place in an increasing number of institutions. Such use may be the result of efforts by a teacher, the whole faculty, or be brought about by one or more students requesting an alternative to the killing of animals for the purpose of education.

InterNICHE as a network has supported such achievements by students in a number of cases: A typical example is described by co-author of this paper, Martinsen, of her own experience as a first and second year veterinary student obtaining cadavers acceptable to the Policy. These included species such as pigs, sheep, cows, horses and chickens for anatomy education (Martinsen and Smith, 2005).

Veterinary student Gwendolyne Reyes-Illg at the University of Florida offers a more recent example: Her story, as described on the HSUS website www.animalmemorial.org, is an excellent example of what may be achieved if the faculty is responsive to concerned students' initiatives. The university has set up a willed body donation program for horses and ponies on her initiative. This example highlights the potential of such sourcing being far more efficient and rewarding when a proper infrastructure is in place and the faculty is in charge of or fully involved with the project.

Tufts University School of Veterinary Medicine might be described as the model where the use of ethically sourced animal cadavers and tissue is the standard approach. The university's body donation program has been in practice for over ten years and replaces the killing of retired greyhounds who are now adopted instead. During the last few years the program has been widened to include large animals such as alpaccas, goats and horses (Kumar, 2003).

Ohio State University College of Veterinary Medicine also reports on the success of a body donation program as a source of cadavers for surgery training (Smeak, 2003). Professor of small animal surgery Lara Rasmussen and colleagues at Western University offer another example of a curriculum carefully designed to teach respect for animals as well as excellent mastering of skills and gaining of knowledge (Rasmussen, 2003). Similar approaches exist at Texas A & M University College of Veterinary Medicine and the University of Pennsylvaina, as reported by www.animalmemorial.org.

Potential use for research, testing and therapeutics

Building on the experience and tradition of human tissue banks, ethically sourced animal tissue could also be used within research and testing – for developing new surgical techniques, testing surgical

equipment, acquire cells for culturing etc. Likewise animal blood from healthy companion animal volunteers, stored for life-saving transfusion medicine and an increasing number of other therapeutic purposes is an alternative to the breeding and killing of animals for this purpose. The further development of human tissue banks and the potential development of animal tissue banks with ethically sourced animal tissue only, may support each other in creating a public understanding of the importance of safe and ethical donation of human and animal tissue alike.

Attitudes compared and discussed

The dissection of a killed animal is not a value-free act in the teaching context. On the contrary, this has been described as sometimes being like a 'rite of passage' to accept animal use in general (Capaldo, 2004; Pedersen, 2002; Balcombe, 2000).

Desensitisation, rejecting responsibility of one's actions and impaired sensitivity towards animals suffering have been shown in students subjected to the use of killed animals. The use of ethically sourced animal cadavers and tissue has in contrast also shown to increase mature behaviour as ethical concerns are addressed and consequences are taken (Kumar, 2003). Students typically voice concerns about the origin of the animals used – and depending on the source of the animals this concern will either present awkwardness and ethical questions (in the case of killed animals) or an opportunity to explain and discuss the value of life and respect for animals (in the case of ethical sourcing). The studies describing the effects of use of killed animals on students typically report concerns being disregarded, ridiculed or discouraged through teachers claiming 'responsibility' for the students' animal use, impairing the development of ethical argument and formation of positive attitudes by the students. The teachers implementing ethical sourcing, however, tend to encourage ethical discussion and make them an integral part of the course (Jukes and Chiuia, 2003) thus encouraging conscious development of positive attitudes towards animals.

When ethically sourced animals are used, the faculty themselves show responsibility for the ethical issues. As students show a preference to the teaching methods they are exposed to and a tendency to be influenced by the attitudes conveyed by the teacher (Balcombe, 2000), a position of responsibility and concern will most likely influence the ethical awareness of the students.

Discussion: Obstacles with ethical sourcing and how to overcome them

Sometimes faculties show reluctance to perform the transformation from the morally objectable practice of killing healthy animals for dissection and surgery to implementing the use of ethically sourced cadavers from body donation programs. Such reluctance may be based on the notion that ethical sourcing present practical obstacles. It must be emphasised that practical challenges are always encountered – both with the breeding and killing of animals for use in education and also with the implementation of ethical sourcing. When a new system is implemented the importance of creating a good working infrastructure is always essential for the project to reach its potential. Some universities that have implemented such practices have produced easy-to-follow protocols, such as those available at www.animalmemorial.org, that may be of great help for other institutions.

Some of the often mentioned practical challenges are described below, along with suggestions on how to overcome them:

• *Decomposition of the body:*

Depending on use, cadavers may be frozen (which is the usual method of storing cadavers at veterinary clinics), or stored in cool rooms that are often available in university clinics. Pathology departments may already have the infrastructure in place for storing animal cadavers from university teaching hospitals, and all that is needed is for other departments to copy their procedures. But even when cadavers have to be collected and brought to the university facilities, effective sourcing is possible with a good procedure. Often embalming fluids are needed to store cadavers. Combinations of different chemicals can be used for different tissues and for different end-results, such as diversity in tissue texture and longevity. Some embalming techniques allow for a cadaver to be embalmed after 4-5- days of death (Kumar, 2003). Freeze-drying, silicone impregnation and a range of plastination techniques are other methods for long term preservation of cadavers, organs and thin slices.

• *Insufficient number of cadavers:*

This perceived problem is more related to infrastructure than to the reality of the situation: animals do die from old age, incurable disease or injury in numbers that ought to be sufficient for teaching purposes. A good strategy for providing information will help ensure a sufficient amount of donated animals of all species needed. However, flexibility and creativity is also needed when these programs are in their initial phase. For example, until the program is fully established, with sources identified and infrastructure created, it may be necessary to use different species – such as bird species that are more commonly available, and to use plastinated animals or perform demonstrations.

• *Animals not being clinically normal or 'intact':*

This may turn out to be an advantage rather than a disadvantage. Body donation programs offer the possibility to experience variation and learn about

clinically relevant conditions as well as anatomy. Students may compare different cadavers with different conditions, and gain from that experience. Of course, most body parts of even diseased or injured animals will usually remain normal. As for companion animals being more likely to lack intact reproductive systems, the practice at Tufts University shows how flexibility ensures that teaching objectives are met: animals with intact reproductive systems are plastinated to preserve and save them for subsequent classes of students (Kumar, 2003).

• *Infectious diseases:*

This has not been reported to be a practical problem for the donation programs in use, nor for individual students using ethically sourced cadavers. Awareness of the conditions that make cadavers unsuitable for donation will always be prominent during such efforts. Indeed, the clinical status of donated animals will be thoroughly known because animals from donation programs will have been carefully diagnosed and treated for their condition. Moreover, proper hygiene routines and appropriate disposal of biological material should be standard for every anatomy dissection or cadaver training, as it will have to be with future pathology necropsies and for work in the clinic.

• *Legal situations:*

The legal situation in some countries may present a true practical challenge – for example, the sourcing of cadavers of certain species may have to be limited to a specific area. In some instances regulations and laws might have to be altered according to the understanding of the needs for a humane and high quality education. However, even when specific regulation may present hindrances, creative thinking and a determination to reach solutions will usually enable faculty to create links between the source of cadavers from body donation programs and the universities that need this resource.

Conclusion: Impact on society and universities

Client donation programs provide an excellent example of the multi-benefit solutions that the process of implementing alternatives can offer. In addition to the possible education of the public about the need for donated cadavers for education and research, the professions can display compassion and empathy and build trust with the public by showing respect for the human-animal bond and commitment to an ethical education. Students will be happy that no killing is required, the need for conscientious objection is obviated, and the learning environment is improved as a result. This responsible and conscientious teaching approach will facilitate the development of respectful and morally responsible attitudes in the students. The family of the companion animal is offered an opportunity to alleviate some of its grief by being able to help educate future veterinarians and thus help other animals. Further practical benefits exist, including the responsible use of the existing but neglected resource of disposed animal cadavers, thereby saving energy and money. But most importantly, animal lives are saved by directly replacing the killing of animals whenever animal cadavers and tissue are needed for education.

InterNICHE agrees with teachers who claim that some use of animal cadavers within education is necessary. However, hopefully these same teachers will agree with InterNICHE that no animals need to be purposely killed for such use.

References

Balcombe, J. (2000) The Use of Animals in Higher Education , HSUS.

Balcombe, J. (2006) Pleasurable Kingdom – animals and the nature of feeling good, Macmillan.

Bekoff, M. (2007) The Emotional Lives of Animals, New World Library.

Capaldo, T. (2004) The psychological effects on students of using animals in ways that they see as ethically, morally or religiously wrong, Alternatives to Laboratory Animals, 32(Suppl 1b):525–31.

de Boo, J. and Knight, A. (2005) "Concepts in animal welfare": a syllabus in animal welfare science and ethics for veterinary schools, J Vet Med Educ., 32(4):416-8.

Jukes, N. and Chiuia, M. (2003) From Guinea Pig to Computer Mouse: Alternative Methods for a Progressive Humane Education, 2nd ed., InterNICHE., UK.

Kumar, A. (2003) Client donation program to meet the needs of veterinary medical education: Alternatives to healthy animal sacrifice, in From Guinea Pig to Computer Mouse: Alternative Methods for a Progressive Humane Education, 2nd ed., N. Jukes and M. Chiuia, pp107–116, InterNICHE, UK.

Martinsen, S. and Smith, A. (2005) Norwegian veterinary training based on animal alternatives, "5th World Congress on Alternatives and Animal Use", Berlin, Germany.

Pedersen, H. (2002) Humane Education: Animals and Alternatives in Laboratory Classes. Aspects, attitudes and Impact, Stiftelsen Forskning utan Djurförsök.

Rasmussen, LM. (2003) A pedagogically sound innovative and humane plan for veterinary medical education, in From Guinea Pig to Computer Mouse: Alternative Methods for a Progressive Humane Education, 2nd ed., N. Jukes and M. Chiuia, pp125–133, InterNICHE, UK.

Regan, T. (1983) The Case for Animal Rights, University of California Press.

Smeak, D. (2003) Ethical surgery training for veterinary students, in From Guinea Pig to Computer Mouse: Alternative Methods for a Progressive Humane Education, 2nd ed., N. Jukes and M. Chiuia, pp117–124, InterNICHE, UK.