

Tagungsberichte

New Technics in Lab Animal Science

SGV Tagung, Hochschule für Technik und Architektur
Fribourg, 21.-22. November 2006

An der diesjährigen Tagung der Schweizerischen Gesellschaft für Versuchstierkunde (SGV) wurde den Teilnehmenden eine Fülle von Informationen zu neuen Techniken und Methoden im Versuchstierbereich geboten. Dies beinhaltete unter anderen *in vivo Imaging* Techniken, Telemetrie und Tracking Methoden. Einzelne Beiträge des sehr umfangreichen Programmangebots werden in der Folge beschrieben.

Alle umweltbedingten Änderungen, denen Versuchstiere ausgesetzt sind, sind für die Tiere mit Stress verbunden (bspw. Transport, Versetzen in eine neue Umgebung usw.) und wirken sich auf verschiedene physiologische Parameter (Körpergewicht, Herzfrequenz, Blutdruck u.a.) aus. Heutzutage stellt Radio-Telemetrie ein wichtiges Instrument dar, am wachen und frei beweglichen Tier stressfrei physiologische Parameter zu erfassen. **Klaas Kramer** (*Free University, Amsterdam*) stellte in seinem Beitrag die Ergebnisse einer Studie vor, die die Zeit der Akklimatisierung von Ratten und Meerschweinchen nach einem Transport in eine neue Tierhaltungsanlage aufzeigen. Die Studie verfolgte das Ziel, eine angemessenere Quarantäneperiode für Versuchstiere, im Speziellen für Ratten und Meerschweinchen, festzulegen. Mittels implantierter Transmitter wurde ein EKG erstellt, zudem wurden die Herzfrequenz, die Körpertemperatur und die Aktivität der Tiere

zwei Tage vor und während 3 Wochen nach dem Transport gemessen. Kramer konnte aufzeigen, dass sich die physiologischen Parameter bei den Ratten nach 4, bei den Meerschweinchen nach 12 Tagen auf die Werte vor dem Transport eingependelt hatten.

Bei der konventionellen Telemetrie werden die Transmitter und Sensoren mittels chirurgischem Eingriff implantiert, was zu einer langen postoperativen Erholungsphase führt und das Risiko von Komplikationen birgt. Die Jacket Telemetrie hingegen, so **Mark Deurinck** (Novartis Pharma, Basel), stellt eine nicht-invasive und einfach anwendbare Methode dar, mit der EKGs digital aufgenommen werden können. Dies hat den Vorteil, dass die Qualität der Aufzeichnungen verbessert und das Datenmanagement und die gemeinsame Nutzung der Daten vereinfacht werden. In Dose-range Studien können die Tierzahlen mittels Jacket Telemetrie reduziert werden. Als nachteilig erweist sich, dass mit dieser Methode weder der Blutdruck noch die Körpertemperatur gemessen werden können und die Jackets schadensanfällig sind. Letzteres ist der Grund, warum die Tiere (in diesem Beispiel Hunde) gemäss Deurinck während der Versuchsphase einzeln gehalten werden müssen.

Blutentnahmen gehören im Tierversuchsbereich zum Alltag und sind für die Tiere je nach Methode mit mehr

oder weniger gravierenden Auswirkungen verbunden. Bei der retrobulbären Blutentnahme bspw. können bei unsachgemässer Durchführung ernsthafte Gewebeschädigungen entstehen, die für die Tiere sehr schmerzhaft sind. Seit 1998 wird eine alternative Methode, die sublinguale Blutentnahme bei Ratten praktiziert. Diese führt gemäss **Meike Heimann** (Novartis Pharma, Muttenz) zu keinen Gewebeschäden und ermöglicht die Entnahme grösserer Blutmengen (in Ratten bis zu 2 ml). Eine Studie sollte zeigen, ob diese Methode auch für Mäuse, Hamster und Meerschweinchen anwendbar ist. Dazu wurden die Tiere narkotisiert. Zusätzlich wurden die retrobulbäre und die sublinguale Methode an Mäusen auf Vergleichbarkeit hin untersucht. Die Untersuchung zeigte, dass für die Parameter Körpergewicht und Futter- und Wasseraufnahme kein statistisch signifikanter Unterschied zwischen den Methoden feststellbar war. Es wurden aber Unterschiede bezüglich spezifischer Blutparameter beobachtet. In sublingualen Blut wurden erhöhte Leukozyten-, Lymphozyten- und Monozytenwerte gefunden. Retrobulbäres Blut hingegen enthielt mehr Alanin Aminotransferase, Aspartat Aminotransferase und Glukose. Mäuse, denen retrobulbär Blut entnommen wurde, zeigten grössere Gewebeschäden. Aus den Ergebnissen der Studie folgerte Heimann, dass die sublinguale Blutent-

nahme eine geeignete Methode für Mäuse und Hamster darstellt. Für Meer-schweinchen ist die Methode wegen fehlender sublingualer Vene nicht anwendbar.

Die Bewegungsaktivität wirkt sich gerade bei Mäusen sehr stark auf den Blutdruck der Tiere aus. Dieser Einfluss ist in der kardiovaskulären Forschung von Bedeutung. Mit dem kommerziell erhältlichen Telemeter von *Data Sciences International* (DSI) können die Aktivität sowie der Blutdruck gleichzeitig überwacht werden. Studien haben ergeben, dass die Sensitivität des Aktivitätsindex des Telemeters je nach Empfängerplatte variiert. Dieser Index sei aber, so **Jean-Pierre Montani** (Dept. Medizin/Physiologie, Universität Fribourg) wertvoll, um zwischen verschiedenen in Zusammenhang mit der Aktivität stehenden Probenzeiträumen zu unterscheiden. Um die Einschränkungen des DSI Telemetrie Systems umgehen zu können, haben Montani und Mitarbeiter eine verfeinerte, nicht-invasive Methode entwickelt, um die Aktivität der Mäuse im Heimkäfig zu verfolgen (Einzelhaltung der Tiere notwendig). Dies geschieht mittels hochauflösender Infrarot Strahlen. Diese Auflösung und die hohen Probenraten ermöglichen es dem Forschenden, die Aktivität der Mäuse in Echtzeit zu erfassen und das Aktivitätsmuster der Mäuse über eine Zeitdauer von 24 Stunden zu rekonstruieren.

Um den Energieumsatz mittels indirekter Kalorimetrie (Sauerstoffaufnahme) zu erfassen, ist es zwingend notwendig, den Urin der Tiere zu sammeln. Da mit den meisten Respirationskammern nicht gleichzeitig auch die Urinmenge erhoben werden kann, muss mit einer parallelen Gruppe von Versuchstieren ein zweites Experiment im metabolischen Käfig durchgeführt werden. Dieser Ansatz benötigt zusätzliche Tiere. Mittels einer vergleichenden Studie zwischen einer neuen Respirationskammer (gleichzeitige Erfassung von Gasaustausch und Urinmenge) und

traditioneller Respirationskammer / Metabolischer Käfig wollte **Iris Kunz** (DSM *Nutritional Products Ltd*, Basel) herausfinden, ob das neue System fähig ist, den Urin von Mäusen komplett zu erfassen. Das Körpergewicht sowie die Futter- und Wasseraufnahme waren in allen Systemen vergleichbar. Keiner der untersuchten Urinparameter wich voneinander ab. Die Studie zeigte, dass die Unterschiede zwischen den zwei Urinsammelsystemen gering sind und das neue System der parallelen Erhebung von Gasaustausch und Urinmenge für weitere indirekte kalorimetrische Versuche bei Mäusen eingesetzt werden kann.

Obwohl NMR Spektroskopie eine geringe Sensitivität aufweist, kann diese wichtige Einblicke in den Hirnmetabolismus liefern – diese Ansicht vertrat **Rolf Gruetter** vom *Laboratory for functional and metabolic imaging* in Lausanne. Eine Anzahl wichtiger biomedizinischer Probleme und Fragen (Funktion des Glukosetransports, Umsatz von Glutamat und Glutamin im Hirn, Untersuchung des Hirnglykogen-Stoffwechsels u.a.) kann mittels NMR (*Nuclear Magnetic Resonance*) untersucht werden. Ein Vorteil der NMR Methode liegt darin, dass bspw. Messungen des Verlaufs des Glykogen-Stoffwechsels im Hirn über eine längere Zeit am gleichen Tier erhoben werden können, was zu einer Reduktion der Anzahl Versuchstiere führt. Zudem kann diese Methode sowohl bei Tieren wie auch bei Menschen angewendet werden, was eine Vergleichbarkeit der Resultate möglich macht. Eine Weiterentwicklung der Methode soll künftig erlauben, den GABA Stoffwechsel *in vivo* zu untersuchen und Hirnströme in verschiedenen Bereichen des Gehirns zu charakterisieren. Einige Forschende wenden die NMR Methode bereits an, um Krankheitszustände in Menschen und Tieren zu erfassen.

Die Positronen-Emissions-Tomographie (PET) ist eines der empfindlichsten Bild gebenden Verfahren. Grundlage der PET ist die Darstellung der Vertei-

lung einer vorgängig injizierten radioaktiv markierten Substanz (Radiopharmakon) im Organismus. Dabei werden vor allem biochemische, physiologische und pharmakologische Vorgänge am lebenden Organismus abgebildet. Bis anhin waren PET Studien, so **Simon Ametamey** (ETH, Zürich) aufgrund der räumlichen Auflösung auf Menschen und grössere Tiere wie Hunde, Affen und Schweine beschränkt. Nun sind jedoch neue auf kleine Tiere (Mäuse, Ratten) angepasste PET Scanner kommerziell erhältlich. Mit den neuen PET Scannern wird es bspw. möglich, die molekularen Vorgänge bei Erkrankungen wie Alzheimer und Parkinson zu veranschaulichen und bei der Entwicklung von Medikamenten im Tiermodell oder bei Freiwilligen genauer zu erfassen, wo das Medikament wann aufgenommen oder abgebaut wird. Dadurch, dass der Verlauf von Erkrankungen sowie Arzneimittelwirkungen über eine bestimmte Zeit am gleichen Tier untersucht werden kann, ist es möglich, die Anzahl Tiere in den entsprechenden Versuchen zu reduzieren.

Mit den neuen technischen Methoden (MRI, NMR, PET u.a.) können heute spezifische Fragestellungen nicht-invasiv untersucht werden. Dies hat den Vorteil, dass die Zahl der Tiere reduziert (longitudinal Studien) und zum Teil auch die Belastung der Tiere im Versuch vermindert werden kann. Bei den telemetrischen Methoden stellt sich nach wie vor das Problem der Einzelhaltung, was für die Tiere belastend und aus Tierschutzsicht sehr unbefriedigend ist. Die meisten kommerziellen Implantate senden auf gleichen Frequenzen, was eine Versuchsgruppenhaltung praktisch verunmöglicht. Das sogenannte Buddy-System ist eine Möglichkeit, dem entgegenzuwirken. Hierbei wird den Versuchstieren ein Sozialpartner ohne Implantat beigegeben. Andere Möglichkeiten, die eine Paar- oder Gruppenhaltung ermöglichen, sind der Einsatz von umschaltbaren Geräten oder von Datenloggern.

sus



InterNICHE: Conferences and seminars in Australia, Belarus, United States, Central Europe and beyond

Nick Jukes, Co-ordinator of the International Network for Humane Education (InterNICHE), reviews the organisation's input to a number of conferences and seminars across the world in 2006, and addresses the regional obstacles and opportunities concerning replacement in education and training.

Australia

InterNICHE had a major presence at two important conferences held in the Australian capital Canberra in September 2006. The annual Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART) Conference had a broad audience including many members of animal ethics committees. Its theme was *Responsibilities – The 4th R*, an extension from the event's usual 3Rs focus. The audience of the Australian and New Zealand Society for Laboratory Animal Science (ANZSLAS) Conference reflected the Society's more practical, experimental focus. The majority of participants were animal technicians, usually working in biomedical research at universities and often involved in laboratory animal anaesthesia and surgery.

The InterNICHE presentations, posters and demonstrations of alternatives provided these events with their first ever major input on replacement in education and training. This was due primarily to the interest of the main organisers Geoff Dandie and Simon Bain, and the former's view that replacement has been the hardest "R" for researchers in Australia and New Zealand to address.

InterNICHE presentations at ANZCCART At ANZCCART, the response to the InterNICHE input was very positive, and feedback suggested overall agreement with the argument for full replacement. In fact, significant reduction in harmful animal use for teaching purposes has already been achieved in some universities. The presentation *Ethical and effective acquisition of knowledge and skills in life science education and training* gave an introduction to alternatives and their advantages over harmful animal use. It also called for ethics committees to deny permission for all harmful animal use in these fields (until the modernisation and humanisation of ed-

ucation and training makes such decisions redundant).

Indeed, the *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes*, which has been regulated under the animal protection Acts in each State and Territory, requires that alternatives are used wherever possible. InterNICHE considers this possible in all cases in teaching and training. Effective information retrieval on alternative tools and approaches can support the implementation of the Code of Practice. Recent distribution of over 500 copies of the InterNICHE book and database *from Guinea Pig to Computer Mouse* (Jukes and Chiuia, 2003) to members of all Australian ethics committees will help meet this need. ANZCCART note progress in replacement in the past 5-10 years but stress the need for effective reporting of progress in order to facilitate it further.

InterNICHE has also encouraged the implementation of student choice policies so that conscientiously objecting students are not denied access to superior learning methods. A growing interest from students has helped give rise to policies in several universities, as well as some replacement. And since 2005 it has been possible for the first time for some students in the country to graduate without harmful animal use in surgery.

InterNICHE presentations at ANZSLAS The ANZSLAS Conference focused, as would be expected, on laboratory animal science, but did address alternatives as one of its topics and did feature an exhibition of alternatives. The overall theme was "In good hands", ie laboratory animal welfare.

The use of alternatives for becoming proficient in skills such as animal handling, various clinical procedures and surgery can achieve replacement at the training level. Such use in training is therefore likely to help bring about refinement when working afterwards with laboratory

animal experiments. The replacement aspect provided the common ground between InterNICHE and the participants.

Referring to his experience of the Multimedia Exhibition of alternatives at the 5th World Congress – an exhibition organised by InterNICHE – Simon Bain commented on the potential of alternatives demonstrations for Australia and New Zealand: "There is real value in demonstrating these to open people's eyes to just how far alternatives can go... The display in Berlin certainly impressed me and I feel even if we could capture a small cross-section of it, it would be worthwhile." An alternatives exhibition was therefore organised for the ANZSLAS Conference, featuring software, film, mannekins and surgery simulators from the InterNICHE Alternatives Loan System.

Surgery training and ethically sourced tissue

Alternative "live" surgery practice was arranged as part of the demonstration of alternatives. First attending laparoscopic training for surgeons at Klinikum Grosshadern in Munich, InterNICHE veterinarian and National Contact for Norway, Siri Martinsen, demonstrated the Pulsating Organ Perfusion (POP)-trainer at the conference using "ethically sourced" animal organs. The POP-trainer was developed by Austrian surgeon Gerhard Szinicz to provide enhanced opportunities for surgery practice – particularly minimally-invasive techniques but also open surgery – using waste animal organs. Marketed by Optimist Ltd. (www.optimist.at), the device simulates the blood supply of organs and thus teaches the management of bleeding and complications.

The use of genuine ethically sourced tissue is a replacement alternative to harmful animal use, and is defined in the InterNICHE *Policy on the Use of Animals and Alternatives in Education* (2003) as deriving from a free-living animal who died

from natural causes or an accident, or was humanely euthanised secondary to natural terminal disease or serious non-recoverable injury. In difficult circumstances, for example with a shortage of tissue from a required species, then according to the Policy genuine waste tissue from sources where animals may suffer harm, such as farms and research facilities, may provide an acceptable ethical compromise when all conditions are met.

The organ requirements of the surgery simulator provided a practical test of the degree of challenge of sourcing organs according to the ethical demands of the Policy. InterNICHE National Contact for Australia, Cynthia Burnett, facilitated the process to secure the organs. Because no companion animal dogs died or needed to be euthanised for medical reasons within the time frame required and due to other practical limitations, no ethically sourced organs were available. By liaising successfully with the University of Queensland, the Queensland Department of Primary Industries and the Australian National University, however, kidneys from a farm goat who had been euthanised after a serious accident provided an acceptable compromise. Establishing the infrastructure for body donation programs, as has been achieved in various US veterinary colleges, can avoid the need for compromise and can make the acquisition and use of ethically sourced tissue easier and fully sustainable.

Caring as a clinical skill

As well as an exploration of the InterNICHE Policy and details of loaning and training in alternatives to facilitate of the implementation of these best practice tools, participants also heard presentations from Siri Martinsen. The first detailed her experience in training as a veterinarian using only alternatives – in other words, non-animal learning tools and the approaches of ethically sourced cadaver use and clinical learning opportunities.

The second, titled *Training the Animal Doctor: Caring as a Clinical Skill*, discussed the reasons to look upon care and compassion as essential clinical skills to be developed and prioritised within veterinary education. It looked at the teaching methods that may support or be counter-productive towards the acquisition of these

skills. And it suggested that all harmful animal use, such as laboratory animal works against the principles and ethics of veterinary medicine, expressed in the motto *Primum non nocere* (First, do no harm).

While some participants could clearly support the use of alternatives for training purposes, the suggestion that the true practice of veterinary medicine can only be within the clinic on animal patients was naturally challenging for some technicians and veterinarians working with laboratory animals. The presentation addressed the very concept of care, which generated debate. Many technicians and veterinarians within the laboratory animal field feel that they do care about the animals subjected to experiments. One argued that those working with laboratory animals may have looked more closely at the scientific aspects of welfare, pain and distress, and the alleviation of the latter two, than conventional colleagues. Others said they were in this field because they loved animals.

Siri Martinsen's presentation challenged this idea of being satisfied with caring within the context of exploitation, and suggested that reconnecting with the roots of veterinary medicine as a healing science would mean seeking the patients' best interests in all aspects and cases. Encouraging the participants to always look for their animal patients' true best interests, and thus strive for replacement, she concluded that veterinarians and other animal health care workers have one of the most important potential roles in ensuring full animal welfare and rights.

Humane education and challenge

ANZCCART had a small but significant contingent of anti-vivisectionists and animal rights campaigners joining the remaining 3Rs focused participants. Others were protesting outside. ANZSLAS, however, had escaped the protesters' attention, but it was clearly an interesting experience for all concerned that speakers arguing for full replacement were participating in the event.

With confidence in the message of full replacement of harmful animal use in education and training, and with the pedagogical, ethical, and economic arguments for replacement so strong, the author of this report and Siri Martinsen engaged fully with participants, not only on education

and training issues, but also on laboratory animal science as a method to be questioned. This engagement with the participants involved rational argument informed by published studies on the superiority of alternatives, along with a strong ethical position. Such a process exposes the binary myth and associated prejudices of scientists and activists locked in eternal opposition and with no common ground.

Indeed, the approach of humane education has always included respect, tolerance and the search for win-win solutions whilst supporting critical thinking, ethical and emotional literacy and the meeting of teaching objectives in the most effective and ethical ways. It doesn't shy away from strong challenge of harmful animal use, or from calling for the active taking of responsibility to create best practice teaching.

Conclusion

Despite the efforts of some organisations and individuals, and the encouragement by some Australian government agencies for adoption of the 3Rs, the development and implementation of innovative alternatives – from basic training mannequins to high-tech virtual reality endoscopy simulators – may sometimes have been limited by economic and cultural factors. Comments from an Australian scientist on the Guardian (UK) website, in response to an essay by journalist John Pilger on Australian culture and politics, included the following: "No-one in government cares about education, including the Minister for Education." Another said: "I came back here hoping to share best practices, but no-one wants to know." Those in power were described as not valuing innovation and therefore not providing the necessary investment.

A growing interest and enthusiasm for alternatives is, however, apparent in the region. The ANZCCART Newsletter regularly features articles on alternatives and curricular developments, and some replacement has been achieved. At the ANZSLAS Conference there were a number of private comments on refinement and rehabilitation that had been achieved at the research level at several different universities, and a clear interest in broadening the use of alternatives for training purposes. Commenting on the Inter-



NICHE book and database from *Guinea Pig to Computer Mouse*, which details over 500 alternatives, Simon Bain wrote: "Great book and one is like a child in a toyshop just before Christmas." Some of the alternatives demonstrated were subsequently loaned out to borrowers over the Christmas period.

The established and highly successful self-experimentation practical courses in the Department of Physiology at the University of Adelaide show the potential of grassroots initiatives for innovative methods and how effective alternatives can be. Indeed, the method was identified back in 1994 as an example of best practice teaching by the National Board of Employment, Education and Training Commission, and has been evolving ever since. The ANZCCART and ANZSLAS events have certainly contributed to awareness about alternatives in education, training and beyond; and if teachers, researchers and ethics committees now take responsibility for bringing about the replacement that is possible, significant progress will be made.

Belarus

A national level two-day seminar on alternatives was held in **Minsk** in November 2006.

The main host was the Belarussian Medical Academy of Postgraduate Education, through which all Belarussian medical students have to pass. The Academy collaborated with the Fundamental Research Foundation, the National Committee on Bioethics, and the Ministry of Health for the seminar. Also involved in the organisation were EcoUni, a new body of students and young teachers from Minsk who represented Belarus at an InterNICHE Regional Meeting for former Soviet countries earlier in the year.

The seminar successfully managed to bring together most figures from the country who had an interest in and experience of alternatives, as well as others keen to defend experiments. One speaker, Tatyana Morozkina of the former Minsk Medical Institute, described her many experiments on dogs and subsequent replacement of them during the 1990's, as well as the positive impact of the last significant alterna-

tives event in the country – a 1997 conference that involved speakers from FRAME and the UK Home Office.

The event illustrated the importance of international and western connections to countries like Belarus. According to EcoUni, a major reason for succeeding in holding the seminar was the international – that is, InterNICHE – presence. Still, last-minute difficulties almost caused a cancellation, with the event being rescued only by a senior university figure well-connected with the Ministry.

While the first day of the seminar focused on education and training, the second involved much justification of experiments in research and testing. It also provided an illustration of how some teachers can be convinced of the pedagogical and ethical necessity of alternatives in education and training but still fully support harmful animal use in other fields, where "different rules apply". Privately one teacher described how his research of a few decades ago had involved crushing the paws of dogs, by degrees, and of exploding bombs next to them. Without anaesthesia of course, "to avoid influencing the results". Sometimes it still keeps him awake at night, but animal experiments "do create a dilemma". The Vitebsk Veterinary Academy was noted by several participants as continuing to perform a range of unnecessary and cruel experiments today.

Other teachers described their applications of the 3Rs, but often with little hard information provided. A very limited understanding of alternatives was also sometimes apparent. Historically, killing an animal after a procedure was common practice, whatever the condition of the animal. Two researchers proudly talked of keeping an animal alive instead of killing it in such a situation; but the comment that the animal was then used for a further experiment was added almost as an afterthought, with no mention of his or her welfare and no concept of recovery and rehabilitation.

The general level of education in Belarus was also criticised: despairing at failed attempts to reach consensus in recent years on issues such as organ transplantation and other "bioethical" issues, several participants described such a poor level of debate that even agreement on

what was being debated could not be reached. It also seemed that some of those who are most committed to alternatives in Belarus are at a level of commitment and ethical consistency below those in their former Soviet and other neighbours. Nevertheless, the animal welfare laws and regulations of the Ukraine and the Czech Republic were cited as positive examples and something to aspire to as the Belarussian animal welfare law goes through its third draft.

Historically in command societies genuine informed debate has been rare, with a resultant lack of practice in discussion and critical thinking. And where debate has been possible, it has often been of little consequence. For example, despite the study of bioethics having been encouraged in Soviet times (and even now), the topic of *in vivo* animal use has often been avoided, showing how the discipline has sometimes been more of a diversion from the real issues and an avoidance of real debate.

Although it was not cited as a possible cause, there may be a significant correlation between the level of critical thinking in society and the power of countries' political establishments and media empires over ordinary people. Belarus and the US would be good subjects of study in this respect, and academic Noam Chomsky has certainly explored the latter. For Belarus, the distribution of basic information and resources is considered a priority by InterNICHE. This has begun with Russian-language literature, video material and alternatives from InterNICHE; other organisations are encouraged to provide translated resources dealing with replacement alternatives in research and testing.

Awareness of alternatives is slowly rising, and a national TV station did film the conference. In two reports it enthused about alternatives in education and progress that it claimed was being made towards replacement. *Belarus stands for an alternative to experiments on animals* favourably compared the media-friendly clinical skills training mannekin "Critical Care Jerry" with the dogs in the vivarium; but the report concluded with a statement of full support for experiments in research and testing, including for cosmetics.

United States

As in Australia, the example of the Multimedia Exhibition of alternatives at the 5th World Congress also directly inspired the organisers of the Association of American Veterinary Medical Colleges (AAVMC) 2006 Annual Meeting. The AAVMC Education Symposium *The Use of Animals in Veterinary Medical Teaching: Refinement, Reduction, Replacement* was held in **Washington DC** earlier in the year, with a number of private and faculty producers of alternatives providing hands-on access to their teaching tools in an exhibition at the event.

The symposium was sponsored by the USDA and the Alternatives Research and Development Foundation (ARDF). The InterNICHE book and database from *Guinea Pig to Computer Mouse* was distributed to each participant by the organisers, and the event illustrated progress in American thinking towards alternatives in education and training because of the high level of faculty involvement. With the reception held at the National Institutes of Health (NIH), this first serious interest in alternatives was of course validated by the number of faculty speakers at the event who explored the issue and demonstrated the advantages of humane tools that they had implemented.

The influential American Veterinary Medical Association (AVMA) was also represented at the event. According to their website, "The AVMA is veterinary medicine", and their subsequent 143rd AVMA Annual Convention held in **Honolulu** also had a number of posters from InterNICHE and others promoting alternatives. Articles on alternatives in a special Animal Welfare issue of the *Journal of Veterinary Medical Education (JVME)* appeared at the same time. After the Washington DC symposium, the AAVMC Board of Directors added responsibility for welfare to their newly named Animal Care and Welfare Committee.

Central Europe

A central European conference "Alternatives to Animal Experiments in Education", co-organised by InterNICHE Czech National Contact Veronika Charvatova,

the Czech organisation Svoboda Zvirat (Animal Freedom) and others, was held in **Prague** in December 2006.

Gathering academic and campaigning speakers from Czech Republic, Hungary, Poland, Russia and western Europe, the event provided a review of the educational and cultural situation in different countries along with specific examples of implementation of alternatives in life science courses. Alternatives were demonstrated in the second half of the day, with loans from the InterNICHE Alternatives Loan System and distribution of freeware alternatives that were developed through the organisation's Humane Education Award.

Footage for a TV news report on alternatives to animal experiments was also shot at the conference. *Learning to learn without hurting animals* covered the event and featured a selection of alternatives. It was shown in January 2007 on EuroNews, a multi-language pan-European TV station with worldwide reach (including internet availability). The focus of the report was mostly on the use of non-animal alternatives in education and training to ensure the subsequent application of the 3Rs in laboratory animal science.

While such a process may reduce suffering in this field, the program did not sufficiently explore the impact of alternatives in helping to support a fully humane science where cutting-edge non-animal techniques are used for research and testing, nor where veterinarians are involved in clinical work with animal patients rather than experimental work on laboratory animals. Nevertheless, such coverage certainly helps popularise alternatives in general.

The conference provided a boost to activity for alternatives in education in central European countries and beyond. Immediately following the event, a number of Czech high schools requested a speaker on animal protection and alternatives, and a 2-year Czech project on alternatives in education, managed by the conference organisers and supported by the RSPCA, is also beginning.

And beyond

Humane education and alternatives also featured at a conference in **Lisbon** on

Conservation and Animal Welfare organised by the Portuguese Society for Humane Education (SPEdH) in summer 2006. This was followed by an animal rights and legislation conference held in **Barcelona** and the 13th Congress on *Alternatives to Animal Testing* and MEGAT Meeting held in **Linz**. InterNICHE National Contact for Brazil, Thales Trez, contributed to the First Latin American Congress on Humane Education held in **Sao Paulo**.

Further seminars, presentations and meetings addressing alternatives and with InterNICHE input were held in **Buenos Aires, Oslo, Cairo, Seoul, Tokyo** and other locations. Further outreach was held in several Russian cities, including **Rostov-on-Don**, the "gateway to the Caucasus". A degree of awareness and media coverage of alternatives in education and training is now fully global – illustrated by the examples of media coverage in **Tashkent** and registrations for download of the on-line InterNICHE book and database from *Guinea Pig to Computer Mouse* coming from **Baghdad** and **Beijing**, amongst many other locations.

Nick Jukes
InterNICHE Co-ordinator
42 South Knighton Road
Leicester LE2 3LP
England
e-mail: coordinator@interniche.org

References

- Jukes, N. and Chiuia, M. (2003). *From Guinea Pig to Computer Mouse: Alternative Methods for a Progressive, Humane Education*, 2nd ed. Leicester, UK: InterNICHE. ISBN 1-904422-00-4.
- Policy on the Use of Animals and Alternatives in Education (2003). In N. Jukes and M. Chiuia (eds.) *From Guinea Pig to Computer Mouse: Alternative Methods for a Progressive, Humane Education*, 2nd ed. (496-504). Leicester, UK: InterNICHE. Updated Version 2b available at www.interniche.org/policy.htm.