

AAWS Comes of Age

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The Australian Animal Welfare Strategy (AAWS) took a major step forward recently when it hosted its first international conference on the Gold Coast from the 31st August – 3rd September this year. This conference attracted over 350 delegates and featured keynote speakers from around Australia, representing a number of different interest groups as well as New Zealand, India, UK, USA and the EU. This conference helped to showcase Australian Animal Welfare standards and the Australian Animal Welfare Strategy internationally and also helped Australian delegates gain a better appreciation of where we stand internationally in this area.

While the range of papers presented at the conference typically covered the full gambit of human animal interactions, there were a number of papers that either specifically or indirectly addressed issues of central importance to the Research and Teaching Sector. Of course, many speakers addressed issues that are common to many areas of human / animal interactions. These papers were presented under session titles such as 'Animals in Society', 'Regulatory Approaches', 'Animals in Law', 'Animal Welfare Education', 'Quality of Life', 'Assessing Welfare' and

'Sensitivities' to name a few. Importantly, there were presentations that highlighted problem areas as well as the many positive aspects of Animal Welfare in Australia, so delegates gained a "warts and all" appreciation for some issues that will need to be addressed in the immediate future.

A key feature of the work of AAWS relates to the agricultural sector – reflecting the importance of this area, both in terms of the number of animals involved and the harsh economic realities of domestic production and international trade. It was therefore not surprising to see that a significant number of presentations were related to this area. It was however very interesting to see that presentations from overseas delegates in this area were facing the same issues as Australia and were often less advanced. As a lay person in this sector, it was pleasing to see that Australian authorities are clearly working with their counterparts around the world in a very productive manner that will hopefully help to ensure both animal welfare standards and Australia's status as an animal welfare conscious society.

Presentations that were of specific interest and importance to the Research and Teaching Sector were the subject

of three separate sessions. One was on Biology and Technology and focussed on animal welfare in biotechnology as well as euthanasia. The second relevant session included a presentation that described the new NHMRC guidelines to promote the wellbeing of animals used for scientific purposes and another talk that focussed on the importance of putting welfare into practice in the laboratory environment. The third research and teaching related session highlighted a lot of the research being done into animal welfare around Australia and included research that particularly targets industry in general and the livestock industry in particular.

Copies of all papers will soon be available from the AAWS website at:

http://www.daff.gov.au/animal-plant-health/welfare/aaws/aaws_international_animal_welfare_conference.

NHMRC Animal Welfare Guidelines to Promote the Wellbeing of Animals Used for Scientific Purposes

As mentioned above, the recently published "*Guidelines to Promote the Wellbeing of Animals Used for Scientific Purposes*" (NHMRC 2008) were featured at the AAWS08 conference held recently on the Gold Coast. Many conference delegates already familiar with these Guidelines were pleased to see that the presentation folder for these guidelines is now half as thick as the original version, which makes them much easier to carry around. It was also interesting to note that the first revision since these Guidelines were formally released in mid August is available from the NHMRC and can now be down loaded from their web site (see below). Page H4 has been modified since the original version was released and the current version is displayed as a part of the complete version available at the above address. However, all copies of the guidelines downloaded before 20 August 2008 can be updated by downloading the replacement page at:

<http://www.nhmrc.gov.au/publications/synopses/ea18syn.htm>

This certainly justifies the NHMRC describing this as a "Living Document" and demonstrates the value of presenting it in a loose leaf binder, but does not get around the problems of wear and tear associated with the use of a 2 ring loose leaf binder. Hopefully, the use of a smaller binder will help minimise the problem of the loose leaf pages tending to tear out with use.

To date, the NHMRC has concentrated their distribution efforts for these guidelines on AECs around Australia and have not yet had an opportunity to specifically target researchers and teachers, who are probably the people who will most benefit from the use of these Guidelines. It has been suggested that the time is now right for all researchers interested in receiving a complimentary copy of these Guidelines to contact their AEC Executive Officer or their Institutional Research Administration Officer and ask them to send a collated request for copies to the NHMRC, who will endeavour to send the appropriate number of copies to your institution. Alternatively, the most recent version of the guidelines can be downloaded from the NHMRC website at:

<http://www.nhmrc.gov.au/publications/>

2008 ANZCCART Conference: The media gets it wrong again

A number of delegates at this years ANZCCART Conference "Blue Sky to Deep Water: The Reality and the Promise" in Auckland returned home and were amused to read reports in the international media claiming that the conference had been cancelled due to protest action. While the source of this "information" is unclear, it quite clearly proved to be very unreliable.

The 2008 ANZCCART Conference was held in Auckland from the 29th of June through until the 1st of July and was an outstanding success. The New Zealand Organizing committee received well deserved congratulations from all delegates for putting together an excellent and challenging programme of papers and discussion groups during the three day conference.

John Martin (Chairman of NAEAC) opened the conference and spoke about areas of mutual interest to both ANZCCART and NAEAC – particularly on the role play by those that choose to protest against the use of animals in research and teaching. He spoke of the important role ANZCCART has played by helping to maintain some form of dialogue between those that have to use animals in research for example and people who strongly oppose this practice.

The first session of the conference focussed on some of the issues that are associated with the use of animals in various sectors such as research institutes as well as agricultural or pharmaceutical industries. There was also much discussion of issues associated with international benchmarking of 'best practice' and the importance of maintaining the highest standards in any work of this kind.

Discussion groups dominated the rest of the afternoon, which not only proved to be very productive, but also helped all delegates interact with and discuss common issues with group members that spanned the region.

Day two of the conference began with a series of papers on various research models that included both computer and animal model systems ranging from zebrafish to sheep. After a break, there was an excellent session that was set up as a forum for brief presentations describing "unexpected outcomes" as they had occurred in a wide variety of work situations. These included the effects of ammonia levels on animal house rodents and compared this to situation of rats in the wild and showed that rats are not affected by ammonia levels in the way we might expect. Other talks illustrated how the effects of healthy diet and exercise on rats may not all be good, some of the challenges that have been experienced while ensuring full compliance with the Code of Practice in Schools, difficulties that have arisen during the process of translating work on disease models into other species such as the zebrafish, how difficulties getting an application approved by an AEC finally resulted in a great outcome and finally, how a failed attempt to develop an animal model for colitis resulted in a model for spontaneous bowel cancer.

The afternoon sessions of day two were devoted to discussion of issues associated with defining and

challenging our concepts of 'ethics' as well as the problems faced by animal house staff when they have to euthanase animals such as grief and stress. There were several challenging papers presented during the afternoon and these included the Cam Reid Oration, which was delivered by Mark Fisher and the ANZCCART Student Award winner Mairi Stewart.

After an excellent and entertaining conference dinner that included the presentation of the 2008 ANZCCART New Zealand Animal Technicians Award, the conference reconvened the next morning with a session looking at conservation of wildlife. This session featured three excellent papers looking at issues such as the conservation of the Kiwi, animal behaviour in the wild and the problems associated with controlling feral pest species.

The final session of the conference focussed on fish welfare and covered topics ranging from problems experienced with variations in legislation right through to some hard and practical issues associated with analgesic use in fish and so completed the conference theme of blue sky to deep water.

New and improved research technologies in animal research

Animal research is constantly evolving and developing as technology improves. Below are some examples of some new and improved technologies used in animal research.

Expression of body genes

Determining whereabouts in the body genes are expressed is a vital key to understanding disease, and is of great importance for furthering our knowledge of animal and human biology. Two spectacular resources are examples of how new technology in animal research is making these important findings freely available to all researchers in the world. The Allen Brain Atlas at <http://brain-map.org> is an on-line atlas which allows you to browse and view the precise pattern of expression in the mouse brain, for every known gene (about 20,000). This remarkable resource was developed and funded by the Allen Institute for Brain Science, a non-profit

medical research organization established by Microsoft co-founder Paul Allen, and dedicated to understanding brain diseases and disorders. The second resource, called EUREXPRESS (<http://www.eurexpress.org/>), is in development but will ultimately provide an atlas of all gene expression patterns in the developing mouse embryo. Together these resources illustrate the power of large-scale biology coupled to internet databases, meaning that this knowledge is freely available, and it need not be replicated in any other laboratories.

Laparoscopy

Ovulation rate in sheep is the ultimate determinant of maximum litter size. Thirty-five years ago ovulation rate was almost universally measured by laparotomy - surgical opening of the abdominal cavity of the animal, exteriorising the reproductive tract and physically counting ovulation sites. This required general anaesthesia, effective pain relief and often caused abdominal adhesions, which could interfere with subsequent reproductive performance. The number of operations that could be performed in a day was limited (10 per operator per hour). Repeated examination increased the risk of impaired reproductive performance. The risk of deaths associated with general anaesthesia and post-operative infection was relatively high.

The development of laparoscopy led to a rapid *in situ* means of counting ovulation sites. The surgery is minor, and is done under sedative and local anaesthesia/analgesia. Animals are routinely released directly back into the paddock. Throughput rates are high (40-50 per operator per hour), multiple observations can be made on the same individual both within and between years and the incidence of impaired fertility or death as a result of the surgery are negligible.

The routine use of Laparoscopy has led, among other things, to the discovery of genes that influence ovulation rate. Some of these genes have a very small effect. For example, we have discovered a gene that increases ovulation rate by about 0.4 (a flock of 100 ewes carrying the gene would potentially have 40 more lambs than a non-carrier flock would have). Such effects are difficult to measure from simply counting the number of lambs born, as pre-lamb losses can disguise the effect.

Gene discovery requires results from families of animals so that segregation for the genetic advantage can be

measured. Some modes of inheritance mean that there are generational gaps in expression. Laparoscopy enables the information to be gained rapidly and at very low ethical cost.

CT Scanning

Computer tomography scanning has considerably reduced the number of animals used for some quantitative meat quality studies, especially those related to body composition.

By definition, meat quality studies required measurements to be made on carcasses after slaughter. Often, these studies were done on an opportunistic basis when animals were slaughtered for human consumption. There were two major disadvantages of this methodology.

First, if measurements were made at, for example, monthly intervals, different animals had to be used for each measurement. To measure changes over a period of time due to different grazing regimes or feeding supplementation, the data were confounded by the normal biological variation found in any flock or herd. Second, any animal used in a slaughterhouse meat study that may have high genetic potential is obviously no longer available for breeding.

CT scanning allows repeated measurements for fat content, muscle size and meat yield to be made on the same animal. This both decreases the number of animals used in these studies and increases the power of the results. It also allows superior animals to be identified while they are still alive, thereby preserving their breeding potential.

Ultrasound scanning

Ultrasound allows the real-time observation of the foetus *in situ*. Ultrasound scanning has had a major impact on the management of sheep carrying multiple foetuses. It allows animals to be managed according to the size of the litter they are carrying. Animals carrying multiple foetuses require preferential feeding to ensure that the nutritional requirements of the growing lambs are met.

Ultrasound scanning has also improved lamb survival studies. Previously, the number of foetuses was counted by laparotomy and later laparoscopy (see

above). Lamb survival could only be determined in relation to ovulation rate.

The use of ultrasound scanning allows losses prior to scanning date and from scanning to birth to be calculated. This is particularly valuable for determining genetic effects on lamb survival by indicating whether losses occur in early or late pregnancy.

GIS and GPS technologies

Many behavioural studies require observation of animals in their environment. For such studies to be valid it is essential that the animals remain as undisturbed as possible.

The use of remote sensing and positioning technologies has meant that animals can be monitored without the need for any physical observer to be present. While animals can become habituated to hides, and in some cases even artificial lighting, electronic monitoring devices can replace what can act as artificial stimuli. Furthermore, instead of placing animals in isolation pens to observe such things as feeding behaviour, electronic key collars allow animals to be remotely monitored while they are in a group situation.

DNA and gene technologies

The increasingly expanding suite of technologies around DNA and genes are a quantum leap ahead of where we were 10 years ago. This is especially so in the early detection of diseases where genetics can influence resistance or susceptibility. Now, instead of waiting for clinical signs of a disease to appear, a simple gene test done on a sample of blood collected at any time after birth can determine whether or not an animal is likely to contract or resist a disease. This is particularly useful for diseases where the phenotype does not have visible clinical signs, such as internal parasite infestation. Animals can be selected for (or against) particular conditions.

Furthermore, pedigree information can be determined much more accurately. Farmed animals in New Zealand are managed extensively. Animals produce their offspring in the paddock and individual births are only seen infrequently. Pedigree in these situations is determined by association of an offspring with a dam (often with suckling as the determinant). Up to

25% of these subjective allocations of pedigree can be incorrect due to cross-suckling behaviours that are shown by most domesticated species.

A further example is in reproductive studies where the number of offspring an animal produces can be genetically influenced, for example, the Inverdale gene which increases the number of lambs born by about 0.6 (flock of 100 ewes carrying the gene will produce 60 more lambs than a similar flock that does not have the gene). Ironically, this gene has a particular disadvantage in that homozygous ewes are infertile. Previously, the only way to determine accurately whether or not a ewe carried the gene was to use laparoscopy. Although this is a relatively innocuous operation, it is nevertheless a manipulation that requires handling, administration of drugs to the animal and a minor surgical procedure. The only way to determine whether or not a ram carried the gene was to mate him to a group of ewes and then to laparoscope his daughters after they had reached puberty. This requires a wait of about 2½ years.

Now that the specific genetic mutation is known, the genotype of both sexes can be determined at birth. There are a number of other genetic mutations for which the same applies.

Biomembranes

Biomembranes are artificial membranes that will be used to test the toxicity of various chemicals in seafood, without having to use animals.

Currently, laboratory mice are commonly used to test for toxins in seafood. While chemical and immunological detection methods exist, the use of biomembranes will more accurately predict potential toxicity to humans.

This technology has the potential to be used in analytical laboratories world-wide. There is also an added advantage in that it will test more accurately and quickly for toxins, compared to current methods involving live mice.

This is new technology that is still under development. If it can be developed successfully it will eliminate the use of sentient laboratory rodents for testing the toxicity of shellfish and algae, which is currently the gold-standard.

In Praise of the ANZCCART Annual Conference

This is to draw attention to ANZCCART Annual Conferences, to commend, and to briefly mention the benefit of attendance and participation. I have been fortunate to attend several in the course of my job as an AEC secretary. I've been reflecting on the conference topics – which have always been relevant, thought provoking and informative - and in particular on the way they have drawn people from a broad background willing to talk about their experience and to share information.

This year's annual conference titled "Blue sky to deep water: the reality and the promise" was held in New Zealand. The blue sky aspect drew on the issues confronting researchers when their work is to be conducted in more than one State invoking multiple compliance issues - and on the extraordinary change and research opportunity brought about by new technology. The sessions held over three days were centred on sharing experiences, transgenics and modelling, animal euthanasia, wildlife and conservation, and fish welfare. A special Cam Reid Oration was given. There were a lot of speakers and every one was interesting. Some only of the topics are listed here from the programme. Just listing them doesn't do justice but serves to show the trouble taken by many to give points of view for discussion.

- What we know, don't know, and need to know about analgesics and fish
- The fish: Dumb bunny or smart ass?
- The trouble with fish and fish biologists!
- Animal welfare issues in vertebrate pest management and research
- Animal behaviour research for conservation: observation, manipulation, and experimentation in studying wild organisms
- The artificial incubation of wild laid kiwi eggs – a conservation tool
- Euthanasing animals – the human experience
- Grief management for those involved in euthanasing animals

- Recruiting rats to the research resort: the importance of well trained resort personnel
- Infrared thermograph and heart rate variability for non-invasive assessment of animal welfare
- A brief practical summary of ethics
- The benefits of using sheep to model human brain disease
- Using zebra fish in human disease research: some advantages, disadvantages and ethical considerations
- Modelling human muscle activity
- International benchmarking: international accreditation
- Assessing a research project with reference to the big picture
- Meeting animal welfare needs in a biotherapies environment – the challenges faced by an AEC
- Doing animal experimentation in a national organisation with regional responsibilities under state legislation.

The ANZCCART Annual Conference is to be commended for the way it provides opportunity for face to face communication on issues that concern and affect the scientific community.

Helen Malby
November 2008

ANZCCART NZ Animal Care Technician's Award

Animal care technicians working in research, testing and teaching organisations are the personnel who make the use of animals possible in a wide range of experimental situations. ANZCCART New Zealand has established a national award to recognise the significant contribution made by an individual New Zealand-based technician, particularly in regard to the welfare of the animals.

The 2008 winner of the ANZCCART New Zealand Animal Care Technician's Award is **Susan Keall**, Senior Technical Officer - Conservation Ecology at Victoria University of Wellington (VUW). Dr Mark Fisher, ANZCCART New Zealand Chair, presented Susan with her award at the 2008 ANZCCART Conference held in Auckland. Susan then gave a very entertaining and passionate talk on her work.

Susan was originally employed as a laboratory technician in zoology with some responsibilities for animal care. The role has developed into support of research and teaching in the field of conservation ecology in the School of Biological Sciences at VUW, in particular research and conservation of tuatara.

A key area of Susan's work since 1991 has been responsibility for a captive colony of tuatara at VUW. This work has included incubation of eggs, "head-starting" juveniles for reintroduction to the wild, and maintenance of a colony on public display.

The most significant of these programmes is captive incubation of eggs for production of juvenile tuatara to augment threatened island populations (Red Mercury, Stanley, Cuvier and Little Barrier Islands), and to found new island populations (Titi, Mitiu/Somes, Wakaterepapanui and Long Islands). Refinement of incubation and husbandry techniques has enabled high survival of eggs and juveniles, to provide large numbers of young tuatara to be "head-started" for these reintroduction programmes. Improved husbandry has also produced better quality juvenile tuatara for release into the wild, an important factor for ensuring the ability of a founding population to survive and become self-sustaining.

Success of the head-start programme is reliant on good follow-up maintenance of juveniles, through all stages including 5–8 years at the head-start facility, during transit to the release location, and post-release in the new habitat. Susan has been integrally involved in all of these stages, monitoring health and survival and also advising head-start facility staff on husbandry.

Victoria University holds a small colony of adult tuatara for the purpose of advocacy and education,

and since 1996 Susan has held primary responsibility for the health and security of these animals.

Several individuals from this colony are used to support a successful conservation education outreach programme on tuatara. This programme would not maintain its high level of success without the extreme amount of care taken to ensure the welfare and security of the animals, as well as the safety of members of the public who are given the opportunity to meet the tuatara up close.

Susan's position at VUW in supporting research requires training of new staff and post-graduate students in husbandry aspects of their own research projects. Her knowledge and experience in this area enables continuity in the techniques and good husbandry practice used. Advice on husbandry is also requested by other organisations with captive tuatara, including San Diego, Auckland, Wellington and Hamilton Zoos, and Nga Manu Nature Reserve near Waikanae, north of Wellington. She advises the Department of Conservation's Tuatara Recovery Group on tuatara husbandry and management of translocated populations. Several Māori kiwi groups are developing education outreach programmes involving the use of live captive tuatara, and Susan also advises and mentors these groups.



Susan Keall being presented with the 2008 ANZCCART New Zealand Animal Care Technician's Award by Dr Mark Fisher, Chairman of the ANZCCART New Zealand Board at the ANZCCART Conference held in New Zealand.

News from Overseas

Animal Testing: Launch of a new website to inform about the development of alternative methods

The European Commission has launched a new website, the so-called 'Tracking System for Alternative test methods Review Validation and Approval (TSAR)', designed to track the development of new alternative test methods which should replace, reduce and refine current animal testing.

"The launch of this website is good news: it proves that we are serious about our commitment to develop alternative methods to animal testing and to be transparent about progress being made" said European Science and Research Commissioner Janez Potočnik. "It is in all our interests to avoid the use of animals in testing, for both ethical and animal welfare reasons. We also need fast, reliable and cost-effective test methods which ensure the safety of products for users, to help European industry, and which satisfy regulators."

The purpose of TSAR is to enable citizens and other interested parties to track progress of the review, validation and approval of alternative test methods, ensuring greater transparency of the process. The ultimate aim will be to cover each and every step of the validation route, from submission of a new method for pre-validation through to final adoption by its inclusion in EU legislation and/or related Guidance Documents. It will also explain the decisions that have been made at every step of the process. When the final decision on a proposed test method is negative, TSAR will clearly indicate the reasons why this decision has been taken. The website will be updated whenever a phase in the process is completed, ensuring the latest information is always available. However, to enable a rapid launch, the initial version covers only the part of regulatory approval of methods in the field of chemicals.

New alternative tests are subject to a process

involving several stages of development, from proposal for validation to final inclusion in the EU regulatory framework. By consulting the website, it will be possible to check whether an alternative test exists, for example, to test for "skin irritation and corrosion" and to know if that method is already accepted in the EU legislation or for other regulatory use. Detailed information on each method will also allow interested users to know which domain of the 3Rs the method applies to - i.e. if it reduces, replaces or refines testing on animals - and which legislation refers to the method (in case of methods already adopted for regulatory use).

The website is managed by the Joint Research Centre's Institute for Health and Consumer Protection.

Website address: <http://ihcp.jrc.ec.europa.eu/tsar>

Universities Federation for Animal Welfare - Research and Project Awards

Through its Research awards, UFAW aims to encourage high quality research that is likely to lead to substantial improvements in animal welfare. UFAW seeks to promote both fundamental research aimed at providing new insight into the subjective mental experiences of animals relevant to their welfare and at understanding their needs and preferences, and also to promote applied research aimed at developing practical solutions to animal welfare problems. UFAW is concerned with the welfare of farm, companion, laboratory, and captive wild animals and with free-living wild animals whose welfare is compromised by humans.

For further information regarding this opportunity and application forms, please visit their website:

<http://www.ufaw.org.uk/ResearchandProjectawards.php>

No closing date

Universities Federation for Animal Welfare - Small Project and Travel Awards

Through its Small Projects and Travel awards (up to £3,500), UFAW supports a variety of activities for the benefit of animal welfare. Applications may be made for the purchase of equipment, for the organisation of (and, sometimes, to support attendance at) educational meetings, lectures and courses, and for publication, translation or transmission of information on animal welfare and for other small projects in support of UFAW's objectives.

For further information on these awards, guidelines and application forms, please visit their website at:

<http://www.ufaw.org.uk/UFAWSmallProjectsandtravelAwards.php>

No closing date

ANZCCART Conference 2009

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Port Douglas, QLD, Australia

For more information visit:

www.adelaide.edu.au/ANZCCART

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