

Ethical issues relating to transgenic animal production

This paper examines the origins of questions concerning transgenic animals, how we make ethical decisions, and whether ethical issues relating to transgenic animal production are different from those in the production of non-transgenic animals. It examines one example of an application of a utilitarian approach to making decisions about transgenic animals, and some of the many ethical questions arising from the consequences of transgenesis.

Sources of ethical issues

Ethical issues associated with genetically modified animals are sometimes discussed as though they are synonymous with welfare issues, although they arise from many sources, primarily:

- * Our views and beliefs about animals and nature, and the relationship of animals with humans.

- * The demonstrable and possible consequences of producing and using transgenic animals, including those related to animal welfare, ecology and the environment, economic and social factors, and human health.

A generalised framework for making ethical decisions

As scientists, welfarists, members of Animal Ethics Committees, and members of the broader community, how do we weigh ethical issues about the use of animals? Most people take an approach that philosophers might describe as "preference utilitarianism". Simply, we examine the relative weight of benefits that will be gained by a particular use of an animal compared to harm that will be done by that use, but tempered by the level of consciousness that we ascribe to the species, and the level of

empathy that we feel with it.

Our decision-making process often includes "intrinsic" objections to certain uses, uses that are objectionable of themselves, irrespective of the weight of benefit that might arise from the use. Intrinsic objections lie at the heart of much opposition about the creation and use of transgenic animals.

That kind of approach is quite appealing as a means of making practical decisions about the use of animals because a cost-benefit analysis is the system we use to make many everyday decisions, and because by bringing empathy into the decision, we are more likely to arrive at a conclusion with which we feel emotionally comfortable. A number of writers in the field have proposed that, just as a decision based purely on emotion is not able to be morally defend-

ed, so any ethical stance based exclusively on logic and reason is likely to fail the test of application to real-life situations. Others disagree, stating instead the view that moral decisions about the acceptability of genetic engineering should be made solely on "a rational and considered basis" (Reiss and Straughan, 1996).

Broadly speaking, the application of this approach to a range of situations delivers three types of outcomes:

- * Some uses are generally acceptable, often because their costs (usually welfare, health and environmental) are perceived as negligible.
- * Some uses are acceptable only where the benefits are sufficiently great and outweigh any perceived costs.
- * Some uses are intrinsically unacceptable, irrespec-

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ANZCCART Conference 2002

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tive of the magnitude of benefits or costs.

Intrinsic objections to transgenic animals are underpinned by a range of social and personal beliefs:

Religious teachings about the place of humans in nature and in relation to a creation deity. Most religions have something to say about the place of humans relative to other life-forms, whether it be one of human dominion over animals, an ethos of stewardship, or explicit instruction about avoidance of association with certain animals. Transgenesis challenges those teachings, and is seen to place humans in the position of "playing God" by creating new life-forms or tinkering with the blueprints of life forms.

Personal beliefs about respect and consideration owed to other life forms. These beliefs are often explained in terms of views about the sentience of other life forms, their aesthetic appeal, ecological value, or wonderment at their biological complexity.

Concepts of the "natural" or acceptable in nature. This often may be expressed in terms of a religious belief, evolutionary process, or ecological dependency. Transgenesis is often perceived as involving the creation of life-forms by means not found in nature.

Concepts of species barriers. Beliefs in barriers between species, in particular between humans and other species, are deeply ingrained and common to most cultures, irrespective of how we view humans in relation to other life-forms or our personal beliefs about the consideration owed to other life forms. The "otherness" of other forms of life is an awareness formed in early childhood. In common belief, species are defined in terms of breeding barriers, and transgenesis is seen as breaching those barriers.

The economic nexus – "patenting and ownership of life". The commonly held belief that patenting and ownership of

transgenic life forms is wrong seems at odds with the general acceptance of the ownership of non-transgenic life forms (livestock, pets, strains of plants). The apparent contradiction may be explained in terms of a more subtle view of the human-animal relationship, and a belief in the existence of a "natural purpose" for animals. Ownership of non-transgenic life-forms may be seen as a relationship based on stewardship or custodial responsibility, whereas the patenting of transgenic life forms is seen to subvert human obligations inferred in that traditional relationship, and implies no natural purpose for the organism other than a human-defined one.

How important are intrinsic ethical objections?

Several surveys of public opinion about biotechnology have identified moral or ethical factors as contributing to opposition to genetic manipulation (see review in Hamstra, 1998). Although surveys such as one from the UK in 1985 found that 70% of respondents thought genetic engineering was "morally wrong" (Reiss and Straughan, 1996), later surveys suggest that public attitudes are based on quite complex and subtle calculations of cost, benefit and ethical considerations, such that the level and nature of intrinsic objections is more difficult to pinpoint.

Identification of intrinsic objections which could contribute to public policy and regulation of genetic engineering is not without problems. Intrinsic objections are based heavily on beliefs rooted in personal experience, hence identifying a set of widely acceptable intrinsic objections that could be applied in a consistent manner is likely to be difficult.

Proponents of genetic engineering sometimes don't take intrinsic ethical objections with a great deal of seriousness, assuming that any opposition that does not focus on welfare or health or environmental concerns is simply an emotional reaction

to the introduction of a new technology that is without any kind of rational basis, and can be expected to disappear as people become accustomed to the new technology (Banner Report, 1995).

Nevertheless, it is quite clear that some intrinsic ethical objections are strongly held, and can't be remedied by addressing welfare or environmental concerns, or by appeals to logic, or by examples which demonstrate some inconsistency of reasoning, or by promises of vast benefits that genetic engineering may bring at some time in the future.

An application of a utilitarian ethical approach to transgenic animals: The Banner Report

In 1995, the UK's Ministry of Agriculture, Fisheries and Food delivered a seminal report about the ethical implications of emerging technologies, including genetic modification, on the breeding of farm animals. Commonly referred to as the Banner Report, it articulated three principles for animal use.

- * "Harm of a certain degree and kind ought under no circumstances to be inflicted on an animal.
- * "Any harm to an animal, even if not absolutely impermissible, nonetheless requires justification and must be outweighed by the good which is realistically sought.
- * "Any harm which is justified by the second principle ought, however, to be minimised as far as is reasonably possible."

The Banner Report regarded intrinsic objections seriously and didn't take the view that, simply because those views were often expressed with some degree of emotion, that they were irrational or invalid. It also took the view that an assessment of ethical matters simply on the basis of a cost-benefit analysis, without acknowledgment of the intrinsic objectionableness of

some actions, is not acceptable to the majority of the community, nor is it a good basis for public policy. Cost-benefit analysis could not be the sole test of ethical acceptability, it said.

The Banner Report summarised the range of intrinsic ethical objections as arising from a belief that some use of animals:

"...involves an essentially improper attitude towards them, expressing, in effect, the view that animals are no more than the raw materials for our scientific projects or agricultural endeavours ..." Such an attitude "fails to take account of the fact that the natural world in general, and animals in particular, are worthy of our respect as possessing an integrity or good of their own, which we ought not simply to disregard." (p. 12).

The Banner Report took the view that transgenesis was not intrinsically objectionable, but some of its applications could be. Whether the nature of the genetic modification involved the transfer of genetic material between species, or simply modification within a species' genome, was irrelevant to its ethical acceptability.

Using these principles, the Banner Report divided the use of emerging technologies on animals into three categories:

- * *Uses which are generally acceptable within the requirement for minimisation of harm* included techniques such as embryo transfer, that can be used in the development of transgenic animals.
- * *Uses which are justified only in particular circumstances where substantial good is expected* included the use of animals for xenotransplantation (animals raised for the transplantation of bodily organs into humans), currently viewed as a use of transgenic animal production that will be achievable in the near future.

Uses which were identified

as intrinsically objectionable included genetic modification of a type which "can be thought to constitute an attack on the animal's essential nature".

The concept of an essential nature is not new, being similar to the Aristotelian concept of telos, the end state or goal of an animal, and the basis of arguments put forward by modern-day ethicists such as Holmes Rolston and Michael Fox. Its critics argue that the concept of an essential nature is useless as the basis for an ethical system because it is not practically possible to draw up a set of rules which objectively defines the essential nature of a cow or pig or chicken.

Rather than trying to provide rules about what constitutes an attack on essential nature, the Banner Report (pp.14-15) cited three hypothetical examples to illustrate their view of what was, and was not, acceptable:

Genetic modification that increases the protein content of cows' milk. The Banner Report took the view that this kind of modification "seeks to enhance a particularly desirable trait...does not affect the animal's defining characteristic, nor threaten the achievement of its natural ends or good...but respects its essential nature and well-being."

Genetic modification that causes poultry breeding stock to produce only female chicks. The Banner Report took the view that this kind of modification "would not deprive the chicken of the freedom to express normal behaviours", although it is more radical in the sense that the end result may not be argued to be a straight-forward enhancement of a particularly desirable existing trait.

Genetic modification that decreases the sentience and responsiveness of pigs, thus making them more sedentary and quicker to put on weight. The Banner Report took the view that this kind of modification, irrespective of any benefit to profit margins, is ethically objectionable because the human ends and

purposes override the ends and purposes which are natural to the animal, and is an attack on the animal's essential nature.

"Transgenic animal production is no different from conventional breeding methods." The proposition is often put that transgenic animal production is indistinguishable from traditional breeding methods, and since the traditional breeding methods are ethically acceptable, so is transgenic animal use.

Transgenic animal production can be both qualitatively and quantitatively different from animals bred by traditional methods. Transgenic animals can be made to display novel characteristics which cannot be achieved by traditional breeding and treatment methods, and so can be used for some entirely new purposes, and for a wider range of existing purposes (such as acting as medical models for a wider range of conditions).

Transgenesis also enables us to expand uses to which we can put animals at a far more rapid rate than do conventional breeding methods. It is different, even if the nature of the difference is primarily the rate of change which is made possible. Irrespective of whether the nature of that difference between particular transgenic and non-transgenic methods is more one of rate of change made possible rather than qualitative change, it does not follow that there are no ethical differences - just that perhaps the ethical boundaries are difficult to define.

Bruce and Bruce (1998) discuss the ethical trap of gradualism: because there is general acceptance of the fact that humans have used pigs for meat for millennia, and more recently for medical uses such as skin and heart valve transplants, therefore there is no ethical difference between those uses and xenotransplantation. To accept that view is to assume that we condone all use of animals, or any use for which there is some human benefit, simply

because we condone some uses.

It does not follow that our acceptance of a current practice implies or requires that we accept a similar practice - sometimes it just forces us to reassess our acceptance of the current practice. So an outcome of deeper consideration of the ethics of genetically modified animals may be a reassessment of our ethical acceptance of non-transgenic current farming and breeding practices.

Transgenic animals are certainly different from non-transgenic animals in that it is much harder to *make ethical decisions* about their use, and this is a very real problem for regulatory groups as well as the public. Leaving aside the question of which intrinsic objections should contribute to regulation, the main problem is that the level of uncertainty around both costs and benefits is so much higher for genetically modified animals. It is that much harder to predict the nature of undesirable outcomes, and to estimate the probability of achieving an outcome, whether undesirable or those which might be the objective of the work. It is also much easier to produce extreme and unforeseen outcomes.

This uncertainty is principally due to genetic engineering being a leading-edge technology that we understand imperfectly, and our attempts to manipulate genes towards particular outcomes are, to a large extent, experimental. Secondly, the technology has evolved more rapidly than our capacity to regulate it, and has been driven in part by commercial interests, both which may have resulted in some lack of access to information that would allow those risks and benefits to be evaluated more accurately.

Ethical issues derived from consequences

Many ethical questions arise from the consequences (animal welfare, environmental, human health, social and economic) of the development and use of transgenic animals. Some commonly

voiced concerns are presented here, with examples of their origins.

Is it ethical to use transgenic animals where the purpose of that genetic modification means that disease or disability or environmental degradation will be inevitable? The often-cited example is that of oncomice, mice genetically modified to inevitably develop cancers. A second example is the Australian proposal to release transgenic bacteria which will make ruminant stock animals more immune to the poisonous effects of fluoroacetate. This proposal was rejected by the Genetic Manipulation Advisory Committee after widespread criticism on environmental grounds. The genetic modification would have enabled livestock grazing to be expanded and intensified in areas of native vegetation which was previously protected by its naturally high levels of fluoroacetate, with probable effects on the conservation of native fauna and flora. The high risk of spread to feral ruminant populations was also of concern.

Is it ethical to establish transgenic animal lines where there is much greater "wastage" of animals? Some sources of wastage include low success rates of current techniques to create novel lines of transgenic animals (often cited at 2% or less), and inherent phenotypic instability that requires culling of variant animals in order to keep the transgenic line "pure". A third source may be variable demand for a wide range of animal lines, placing pressure on businesses that supply animals to manage their stock animals in ways which increase economic efficiencies but require more culling.

Is it ethical to use transgenesis to address welfare concerns and downgrade conditions of care? Transgenesis is often cited as having the potential to reduce welfare problems in animal production, in particular reducing disease susceptibility. However, it could be argued that (using the example from the Banner Report) the transgenic pig that has been modified to have

decreased sentience and responsiveness is less likely to experience suffering from its condition, and hence that the genetic modification produces a net welfare benefit for the individual. Taken one step further, the view could be taken that such a pig would be equally content in a smaller enclosure than those given to its non-transgenic pigs.

If it were possible to produce a transgenic chicken that was less aggressive, based on an argument that it would reduce the need for practices such as de-beaking, would that be ethical? The issue would have to be weighed against the question of whether there are other ways to reduce pecking that don't involve a genetic modification – ways such as larger and better designed housing and avoidance opportunities.

Is it ethical to develop transgenic animals where benefits are not primarily for health, welfare or environment? For example, are economic efficiencies, human comfort (such as baldness cures or pets with novel characteristics), or scientific curiosity and public acclaim (such as the much-publicised plan by the Australian Museum to clone the Tasmanian tiger) sufficiently ethical reasons to develop transgenic animals?

Do we need some transgenic applications?

Discussion of pros and cons of particular transgenic proposals is sometimes played out without much consideration of the need for some transgenic applications. There seems to be an assumption that, risk factors providing no barrier, the "market" for transgenic animals should be the primary determinant of what new transgenic animals should be developed. However, the question of need may be quite strong in the public mind. It may explain the apparently greater acceptance of transgenic animals for medical uses than for food production which is evident in some surveys (see Hamstra, 1998).

The public is quite ready to ask questions such as: "Why do I need transgenic cows which have higher-protein milk when I already have a protein-rich western diet?" and "Why do I need a transgenic pig which produces meat at a lower cost when non-transgenic bacon is only \$7 per kilo?" The question of need has not been seriously considered in public debate, nor addressed by proponents of biotechnology.

Conclusion

Ethical concerns about transgenic animal use stems from both intrinsic objections, and the purpose and consequences of transgenic animal production. Intrinsic objections will not disappear from public belief or public policy simply because they might be emotionally expressed or viewed as difficult to apply in a consistent manner.

The use of transgenesis to improve animal welfare outcomes should not be assumed to be a preferable alternative to developing, exploring and implementing better practices in the way animals are housed and treated.

It doesn't necessarily follow that because we accept some uses of animals, we accept all uses, or that our acceptance of current practices about non-transgenic animals implies or requires that we accept a similar practice for non-transgenic animals. Considering whether transgenic animal production is ethically similar to non-transgenic animal production suggests that both forms deserve deeper ethical consideration, preferably as a whole rather than separately.

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Editor's note

This paper was presented at workshops held on the Welfare of Transgenic Animals in Sydney on 28 November and Melbourne on 30 November 2001.

Notes from the workshops on Transgenic Animal Welfare

ANZCCART held workshops on this topic in Sydney and Melbourne in late November 2001.

Notes from these workshops are now available for downloading from ANZCCART's website

www.adelaide.edu.au/ANZCCART/

These workshops were sponsored in collaboration with the Animal Welfare Committee of the National Health and Medical Research Council (NHMRC).

Welfare audits for farm animals and implications for transgenic animals

For the last two and a half years a collaborative project has been underway to develop a comprehensive welfare audit for the chicken meat industry. This is a landmark project in that it provides the world's first comprehensive animal welfare audit for an entire industry, in this case for the chicken meat industry from the hatchery to the processing plant. It provides an agreed set of questions for an auditor to use that have been developed in conjunction with inputs from a number of stakeholders and that are based on good farming practices in the industry.

Currently, the only welfare requirements for farm animal industries to abide by are "codes of practice" for individual industries. These "codes" are developed by SCARM (Standing Committee on Agriculture and Resource Management) and agreed to for national adoption by ARMCANZ (Agriculture and Resource Management Council of Australia and New Zealand). Such national/state codes are either adopted without change or there may be some minor modifications by individual States and Territories to meet local requirements. A perceived negative aspect of codes of practice for farm animals is that they are seen as generally reflecting only minimum welfare standards. One benefit of a welfare audit is that, in time, it will assist in changing the perception of an industry that is seen as only complying with minimum welfare standards to one of an industry striving to achieve high welfare standards.

While this welfare audit documentation for the chicken meat industry and similar projects that are under way for the pig and dairy industries are being developed for animals of normal genotypes, there is no reason why the principles cannot be utilised for transgenic animals.

Some of the principles are to decide on the industry sectors to be covered and to form an appropriate management group that is manageable in size, representative of all stakeholders and has the appropriate expertise or networks to obtain required information. For the chicken meat audit the Management Group had representatives from industry, the welfare lobby, legislators and research and teaching staff. It was also an attempt to have a consumer representative, but there are few consumer organisations in Australia. For transgenic animals it would be very worthwhile including a consumer representative, or at least one or two community representatives, similar to the position held by category D members on AECs. The chicken meat industry was divided into the following sectors: hatchery; broilers; breeder rearers; breeder layers and pick-up; transport and processing sectors.

For transgenic animals, we must first decide what the industry is. There is no reason why audit documentation for farm animal species cannot be developed or modified to include issues of concern for transgenic animals. Currently, the number of transgenic farm animals is probably small and the major part of the transgenic industry is laboratory animals for research and laboratory animals and perhaps transgenic farm animals for pharmaceutical developments and production. Thus, this industry is part of the laboratory animal industry and it will be necessary to develop documentation for different species and strains and include the range of transformations, from simple to complex. Deciding on the industry sectors will vary, depending on the species and strain, but areas that should probably be included for all species/strains are parent stock and gestation, neonatal and postnatal development,

rearing, breeding and transport and relocation.

Another important principle is to have terms of reference to ensure a project, once started, is completed on time. While every attempt should be made to reach consensus, this may not always be possible. Some useful clauses along the following lines are suggested for inclusion in terms of reference:

- i) Recognise that the research group is responsible for completing the project and therefore may need to make decisions contrary to individuals' opinions. Notwithstanding this recognition, attempts will be made to reach a consensus.
- ii) Recognise that it is not the intention of the audit documentation to change the "code of practice", although it may identify areas that require change.

It is important to identify to the management group what welfare audits will not achieve. They will not achieve either quick changes to current industry practices or resolution of controversial issues. Nevertheless, they can identify and encourage adoption of best practice, identify areas that may require further examination and identify areas in relevant codes of practice that may require resolution. In relation to transgenic animals it would need to be made clear that this would not be the forum to resolve ethical issues surrounding the production and use of such animals. Nevertheless, it is an appropriate forum to raise such issues and to include them in background/training sections of the documentation, so that industry is made aware of the breadth of the issues. The focus of a welfare audit is on the practical animal and facility management issues that contribute to welfare.

While animal houses associated with research institutions and breeding establishments in Australia are licensed and audited, there is no agreed audit documentation, based on the experiences of developmental problems and best practice, such as those being developed for the agricultural animal industries. As well as providing standardised audit documentation, an important benefit is for self-assessment to determine how facilities are performing compared to industry targets and to identify areas for improvement. There is community concern about animal experimentation and a greater concern about transgenic manipulations of both plants and animals. These concerns are recognised by States having separate sections in legislation for animal experimentation and a separate body involved with issues of genetic manipulation. If industries do not address community concerns themselves, there is likely to be further regulation imposed. A recommendation from ARMCANZ at the end of the year 2000 for the egg industry, provides some guidance. They have recommended that the industry develop a quality assurance (QA) programme that includes food safety, biosecurity and welfare. In the future, it is likely that those industries which have QA programmes that include welfare and that have some external auditing will receive less scrutiny from government.

Industry-wide feedback was obtained for the chicken welfare audit by circulating drafts for comment to all chicken meat companies and revised documents were subsequently provided to companies as both hard copies and on a CD. Each booklet has audit questions, background information on the purpose of the questions and how the questions/practices relate to welfare and the Codes of Practice for welfare

for both the transport and keeping of poultry. Examples of recording sheets are also included to assist farmers/unit managers demonstrate compliance with an audit. The audit questions include both critical questions, which are defined as those where "if something goes wrong the welfare of the birds is irrevocably damaged" and good practice questions which reflect the current state of knowledge and its practical implementation in the industry. For a number of areas there are "targets" for farmers/unit managers to aim for, based on current industry information on good farming practice, or that act as a trigger for attention. The audit questions have been based around management tasks that are routinely conducted. Thus, welfare is integrated into routine farm and animal management and is not considered as a separate task. The purpose of the audit documentation is three-fold: firstly, to provide documented evidence of high quality animal care by identifying and encouraging best practice for each sector of the industry; secondly, to identify and monitor equipment and animal problems associated with quality animal care; and thirdly to identify and monitor human resource issues associated with quality animal care.

While it was not possible to evaluate all sectors of the audit, there was some evaluation of all booklets "on-farm" to provide feedback on the validity of the questions and any perceived difficulties in implementing the audit. Also, there was a more comprehensive evaluation of the broiler audit. Twenty-four broiler farms contracted to one company were used. The company provided production data for the three previous batches of birds and the farms were ranked from 1 to 24 according to their performance. Pairs of farms with similar performance were allocated to treatment and control groups. The 12 treatment farms received the audit document and were asked to complete the recording

sheets. The 12 control farms did not receive a copy of the audit document and were asked to continue recording what they normally would have done such as mortalities, culls, feed supplied and body weight. Growers participated in the study for three batches of birds. At the end of the third batch, the audit was conducted for the period from two to five weeks of age; this time period was chosen to avoid variation due to pick-up schedules. As expected, record-keeping was better at the treatment farms and there was also a significantly lower mortality (1.37 versus 1.74 %) in the first week after placement.

While a reduced mortality can be considered a welfare benefit, and some production advantage may be expected from implementing the welfare audit, because of the close link between welfare and production, any production advantage should be considered as just a bonus from implementing the welfare audit. A welfare audit is seen as having a number of advantages. These are: an immediate improvement in animal welfare; public reassurance of high welfare standards; market protection and development by having systems in place to minimise industry-wide risks; a mechanism for recommending upgrades to welfare codes of practice; generally higher standards of animal welfare than the minimum standards currently in the codes of practice; demonstrated industry commitment to welfare; continual improvement in animal welfare; certainty for all; intangible benefits including improved production, better maintenance of equipment, fewer crises and improved staff training; less focus on industries with QA by government, welfare groups and the public; improved relationships between industry and welfare groups and the potential to reduce conflict between industry, government and welfare groups; improved industry sustainability.

The model described

above, that covers some of the procedures adopted in developing a welfare audit for an agricultural industry, has some obvious parallels for a similar undertaking for transgenic animals. It allows a range of stakeholders to see the processes /procedures/ outcomes (by appropriate on-site visits), it allows for precise definition of the issues and the development of reasonable targets and review points (based on industry experience and current practices) and it provides for a process whereby a consensus can be reached. It also provides a forum for people with different views to openly discuss some of the ethical issues and provides a means of people getting an appreciation of others' views in a non-threatening situation. The issue of having agreed and standardised welfare targets is one that is generally lacking for most commercial animal enterprises.

Some important components in developing the model are the need for a management group that includes wide representation and particularly includes non-industry stakeholders, e.g., RSPCA and/or Animals Australia, agreed terms of reference, availability of a confidentiality agreement for participants, if it is deemed to be required and acknowledgement that it is a process cannot be rushed, as the stakeholders have to learn a degree of trust and this takes time.

Specifically, in relation to transgenic animals, as well as laboratory and farm animals, there is already considerable experience and expertise available. Development of a welfare audit, based on the model described above, can take advantage of this experience and expertise and provide some very useful and credible documents for use as a standardised audit tool. It could be used by organisations that are currently involved with transgenic animal production and those who wish to develop such animals. The suggested targets to be developed are similar to those that would be

used for conventional species, such as specific targets for growth rates, survival at birth, to weaning and during rearing and temperature, housing and ventilation targets. Less tangible, but equally important targets, such as appearance, sound and behaviour at specific stages of development and best methods of euthanasia are also suggested for development. In addition, because of an awareness of problems associated with transgenic animal production, the list of targets could be expanded, depending on the species, to include birthing difficulties, standing and competency of movement at birth, teat seeking, sucking and suckling behaviours (as indicators of potential viability), and behavioural tests to indicate appropriate rates of development such as learning tests, social behaviour observations and tests and fear tests. The latter is predicated on the view that fear of novelty develops at appropriate stages of development for the species. The purpose of targets, and the requisite record keeping, is firstly to provide some standards for determining compliance with an audit and secondly to provide early identification of problems and intervention. Thus, the process is one that encourages continual improvement, on an industry-wide basis.

The process outlined above is a way of capturing the knowledge and expertise that is already available and subsequently applying the knowledge and measuring the outcomes, using existing audit procedures that are already in use for the transgenic animal industry. It is highly likely that the expertise and knowledge is available, but bringing it together is a costly process, probably in terms of dollars and certainly in terms of time.

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Animal use in veterinary science teaching

Changing patterns of animal use for learning in Veterinary Science

The Faculty of Veterinary Science at the University of Sydney aims to produce veterinarians who are competent, confident and compassionate. Veterinary graduates must be skilled at managing clinical problems and should be advocates for the care and welfare of animals. The Faculty has been an active partner in the University-wide move to reduce, replace and refine the use of animals in teaching and research. However, in order for veterinary graduates to become experts in animal treatment and care they need to work with animals in a variety of different contexts. Consequently, complete replacement of animals in teaching is neither feasible nor desirable so we must balance the competing needs for students to gain experience with animals (to achieve competence) with our desire to reduce animal use. Students achieve competence in the key skills of animal handling, surgery, clinical practice and anaesthesia through direct experience with live animals. Veterinary education must also enable students to develop and refine their beliefs and attitudes to animal use. We need to demonstrate the highest ethical standards and accommodate the diversity of views that students hold on animal welfare. Since the Faculty adopted an Animal Welfare Policy in 1999, it has introduced policies on Animal Use in Teaching and Applied Anatomy, Small Animal Surgery and Anaesthesia, and Conscientious Objection (see faculty web site www.vetsci.usyd.edu.au)

Our new curriculum (introduced from 2000) develops the key themes of animal welfare and ethics throughout the course, starting with Professional Practice and Animal Husbandry (year 1, 2), Animal Behaviour and

Welfare Science (year 3) and Clinical Practice Units (years 4 and 5). The major changes in Faculty philosophy and use of animals over the last five years have been:

- * replacement of non-survival practical classes using laboratory animals with other forms of teaching;
- * replacement of live animals for surgery and anaesthesia teaching with clinical cases including a new spay/neuter clinic;
- * increased use of cadavers (from abattoirs or animals that were killed for other reasons);
- * refinement through an increase in the non-invasive use of animals.

Reduction and replacement

Veterinary physiology has reduced and replaced animals in teaching over the last 5 years. Over 300 rabbits, rats, mice and sheep were previously used each year in laboratory-based classes. Usage was reduced to zero in 2001. This change has been driven by two factors: development of well-defined learning outcomes that link physiology to clinical practice, and recognition of the changing views of staff and students on non-survival experiments with animals. Many students raised conscientious objections to killing animals for teaching. The rationale proposed for use of live animals in laboratory classes included development of skills in animal handling, anaesthesia, surgery and physiological monitoring. The classes also provided a vivid learning environment for the students. However, skills in these areas are addressed in other clinical units of study, and they were not specific learning objectives for physiology and were not assessed.

Frequently the classes were dominated by technical difficulties of setting up experiments, limiting the time available for reflection

and discussion of the meaning of the results. Data from these experiments were used as a focus for workshops to replace the practical classes in cardiovascular and respiratory function. Non-invasive practical classes are also conducted using students as their own experimental subjects (e.g., to examine sensory perception and to monitor cardiovascular function). Commercially available computer programs have replaced experiments on homeostasis and neuromuscular contraction.

Plastinated material is being used to replace some fresh and fixed dissection material for anatomy. This is a relatively new technique where fixed animal tissues are replaced gradually with silicone polymers or epoxy resins to produce an accurate, durable anatomical specimen that can be handled by students. Abattoir specimens are used to teach production animal anatomy wherever possible.

Live dogs have been replaced with cadavers for surgery practical classes. These cadavers are unwanted dogs that have been humanely killed as part of routine pound operations. It is important to stress that the University has absolutely no influence over their supply. Instead of being incinerated immediately by the pound, the cadavers serve as a valuable teaching resource. Students also use a variety of foam and wood models to gain experience with suture and orthopaedic techniques. Final year students gain experience in live animal surgery by participating in the University's recently established spay/neuter clinic. Around 400 dogs from the pound per year go to new homes and are desexed by students working in the clinic. This provides a high quality learning experience for students and a valuable service to the community.

A combination of videos, computer programs and models have replaced many of the animals previously used to teach clinical skills. The faculty has produced 20 videos for equine medicine and surgery, plus videos on assisted reproduction techniques. Videos are also used to illustrate diseases in veterinary clinical toxicology and exotic diseases.

Refinements and shifting patterns of use

Dogs, cats, horses and other companion animals are brought in for classes where they are used non-invasively to demonstrate animal handling, behaviour and clinical examination skills. Students also gain early experience in handling companion animals through a variety of tasks they complete at Educational Support Veterinary Practices during the first years of the course.

Conclusions

The use of animals in veterinary education at Sydney University is changing to better reflect the range of views held by our students, staff and the community. These changes do not necessarily mean a decline in the quality of students' "hands on" experience. Rather they have resulted in a careful reappraisal of the learning outcomes of the veterinary curriculum and development of some creative alternatives that enable students to gain experience with animals and to develop strong skills in ethical management of human-animal interactions.

Rosanne Taylor
Chair
Teaching and Learning
Committee
Faculty of Veterinary Science
University of Sydney

ANZCCART appoints new Director

Dr. Rory Hope has been appointed Director of ANZCCART, initially on a 6-month contract basis. He succeeds Dr. Robert Baker who has taken up the position of CEO of the South Australian Farmers Federation.

Rory completed his BSc (Honours) and PhD degrees at the University of Adelaide in the Department of Genetics. His major research interests were in measuring levels of genetic variation in natural and laboratory populations of Australian marsupials, and in determining the causes and consequences of such variation. The two species used in this research were the brushtail possum (*Trichosurus vulpecula*) and the fat tailed dunnart (*Sminthopsis crassicaudata*). Rory assisted Professor Henry Bennett to establish a fully pedigreed laboratory colony of dunnarts, a colony that has provided a wealth of useful information about the genetics and biology of this species.

Having completed his PhD, Rory spent two years working in the Department of Biochemistry, University of Oxford, where his research involved the use of cell fusion techniques to create inter-specific somatic cell hybrids that contained chromosomes from placental and marsupial mammals. These hybrids proved useful in mapping genes to marsupial chromosomes.

In 1974 Rory returned to the University of Adelaide to take up a lectureship in the Genetics Department. His teaching and research emphasised human biochemical genetics; and population and evolutionary genetics, with special reference to marsupials. His interests and skills gradually changed towards those of molecular biology, and especially molecular evolution, and his most recent research concerns the role of gene duplication in the evolution of gene families in mammals.

Before joining ANZCCART Rory was an Associate Professor in the newly formed Department of Molecular Biosciences at Adelaide University, where he headed the Laboratory of Molecular Evolution.

ANZCCART NEWS goes electronic – for the time being at least

As readers of the last edition (Vol. 14 No. 4, 2001) of this journal will know, *ANZCCART NEWS* (hereafter called "*The News*") will be published electronically rather than in printed format this year.

Over the 14 years since its first publication *The News* has fulfilled one of ANZCCART's major aims, namely the promotion of informed discussion and debate on the use of animals in teaching and research. *The News* now boasts a readership of some 5,000, and has established a reputation for the quality and contemporary nature of its articles. We have become used to seeing copies of *The News*, with its distinctive design, on library shelves and tearoom tables.

The decision to publish *The News* electronically will be reviewed at the end of 2002. In the mean time, instead of receiving a copy of *The News* through the post, readers will need to view it (or preferably download it) from the ANZCCART web site. This will take some getting used to, and we ask for your patience and cooperation during this period of change. In particular, we call for readers of *The News* who occupy leadership positions in organisations, such as Chairpersons of Animal Ethics Committees, Laboratory Heads and Government Section leaders, to make multiple copies of *The News* and distribute these to interested parties. By doing this, we hope to retain our readership base for 2002.

We are presently investigating the future mode of publication of *The News* and ANZCCART would welcome suggestions from readers.

We are establishing an email list for all those who wish to be notified when we post the next editions on the web. Please email ANZCCART at anzccart@adelaide.edu.au if you would like to be placed on that list.

Rory Hope
Director

New animal welfare legislation in Queensland

On 1 March 2002, Queensland's new *Animal Care and Protection Act 2001* (ACPA / the Act) was proclaimed and replaced the outdated *Animals Protection Act 1925*.

The Queensland Government's Department of Primary Industries (DPI) became the lead agency for animal welfare in 1995 and the Animal Welfare Unit (AWU) within the Department's Animal and Plant Health Service was established in 1998. Since then AWU staff have worked with animal user, animal welfare and community groups to develop policy principles and to draft an Animal Care and Protection Bill.

The Bill was introduced to the Queensland Parliament on 31 July 2001 by the Minister for Primary Industries and Rural Communities, Henry Palaszczuk, and was passed unanimously in the House to become the *Animal Care and Protection Act 2001*. Since passage of the Bill through Parliament, regulations have been developed and the first round of training of ACPA inspectors has taken place.

The Act does much more than provide for the legal process to punish people who have been cruel to animals. The Act has features to help people who have responsibility for animals to understand the accepted standards of care that these animals should enjoy.

These features include:

- * a **Duty of Care** on all people in charge of animals;
- * **Codes of Practice** for animal welfare;
- * **Animal Welfare Directions** from inspectors to help people achieve proper standards of care for animals.

Purposes of the ACPA

The purposes of the ACPA are to do the following:

- * Promote the responsible care and use of animals.
- * Provide standards for the care and use of animals that:
 - achieve a reasonable balance between the welfare of animals and the interests of people whose livelihood is dependent on animals;
 - allow for the effect of advancements in scientific knowledge about animal biology and changes in community expectations about practices involving animals.
- * Protect animals from unjustifiable, unnecessary or unreasonable pain (i.e., cruelty).
- * Ensure that the use of animals for scientific purposes is accountable, open and responsible.

Key Features of the ACPA

Proactive, educative approach
The Act promotes the responsible care and use of animals through a strong focus on education, underpinned by legislation.

Applies to all animals
The Act covers all vertebrate animals (except human beings), including fish. It also has the potential to cover certain non-vertebrates such as crustaceans and cephalopods.

Types of animal use
The Act covers all types of animal use, including livestock production, recreation, sport, entertainment and exhibition, the control of feral and pest animals, the use of animals for scientific purposes, working animals, companion animals and wildlife.

Duty of Care
The Act places a Duty of Care on everyone who is in charge of an animal. It is an offence to breach that Duty of Care.

The Duty of Care is to positively provide for the welfare needs of animals. To fulfill their duty of care to an animal in their charge, people

must take reasonable steps to provide the animal's needs for the following in a way that is appropriate:

- * food and water
- * accommodation or living conditions for the animal
- * to display normal patterns of behaviour
- * the treatment of disease or injury, or
- * ensure any handling of the animal by the person, or caused by the person, is appropriate.

The Act uses the word "appropriate" with regard to the Duty of Care. Rather than being rigid and prescriptive, the Act allows the flexibility to cover different types of animal use and different circumstances such as the age, condition and history of the animal.

Codes of Practice

The Act recognises Codes of Practice on animal welfare for a wide range of animal uses. For instance all of the national livestock animal welfare codes (the Pink Codes) are "officially named" in the *Animal Care and Protection Regulation 2002* and are used as benchmarks for acceptable animal welfare standards, thus providing some certainty in business planning and good guidelines to all people involved with livestock on how to fulfill their Duty of Care.

The Codes are also used by inspectors as references to determine whether people are fulfilling their Duty of Care, and as a guideline for issuing written directions to rectify animal welfare problems. Non-compliance with these "named" codes is *not* automatically an offence under the Act. Compliance with a Code provides exemption from acts which would otherwise constitute cruelty – such as mulesing sheep – as long as both the relevant provisions of a code and the Duty of Care are complied with. Other codes are compulsory, rather than "named" and for these it *is* an offence

not to comply with the Code. There will be monitoring programs to ensure compliance with these compulsory codes. Currently the *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes* (6th Edition, NHMRC, 1997) and the *Welfare of Animals in Circuses* Codes are compulsory.

Inspectors

The two main groups from which inspectors are drawn are DPI (these are stock inspectors and veterinarians) and the RSPCA. Inspectors under the Act are appointed only when DPI is satisfied that the person has the necessary expertise or experience, or has completed an approved training program. The Animal Welfare Unit has a professional senior training officer on staff. She has led a team with two staff from the Animal and Plant Health Service Legislative Support Unit and one RSPCA inspector to design and develop a very comprehensive training programme for all future ACPA inspectors. Inspectors have powers to investigate offences of cruelty, seize animals, direct persons to undertake measures to alleviate suffering, recommend the forfeiture of animals and destroy animals.

Accountability of Inspectors

All inspectors, irrespective of what organisation employs them, are accountable for their conduct to the Director-General of DPI. The Act has an in-built range of strict accountability mechanisms.

Animal Welfare Directions

Animal welfare directions allow inspectors to order a course of action to improve a situation where animals are not being adequately cared for. These directions aim to:

- * prevent a potential animal cruelty situation from occurring
- * resolve an existing problem

Inspectors have the authority to issue written

directions, specifying in detail what the person in charge of the animal must do to ensure the animal is properly cared for. This direction could include providing food, water, rest or shelter, or consulting a veterinary surgeon. In the case of livestock, the Codes of Practice would be used as a key standard for determining whether or not animals were being cared for adequately.

Offences

- (a) It is an offence for people to breach their Duty of Care to an animal in their charge.
- (b) There is also a general offence of "cruelty". This covers types of activities that a large majority of the population would instantly agree are absolutely unacceptable. This includes beating, abusing, terrifying, inhumane killing and transporting animals that are unfit for transport. The underlying principle here is that the activity is unjust or unreasonable or unnecessary, and that the animal suffers as a consequence of the activity.
- (c) The Act also lists offences related to what are called "prohibited" events – such as organised cockfights and dogfights.

(d) Other offences include:

- * Abandoning animals.
- * Knowingly causing an animal in captivity to be killed or injured by a dog.
- * Keeping or using an animal as a kill or lure for blooding, racing or training dogs.
- * Feeding harmful or poisonous substances or laying them as baits with the intention of injuring or killing an animal.
- * Allowing an animal under your immediate supervision to injure or kill another animal.
- * Not complying with an Animal Welfare Direction.

There are a number of regulated surgical procedures, and it is an offence to carry out these procedures except if performed by a vet, in the interests of the animal's welfare. These procedures include docking the tails of cattle and horses, cropping of dogs' ears, debarking dogs and declawing cats. There are also restrictions on the sale of animals on which certain of these regulated procedures have been carried out.

Penalties

Some maximum penalties for individuals under the ACPA are listed in the table below. Maximum penalties for corporations are up to 5 times the level for individuals. One penalty unit is currently \$75.

Use of Animals for Scientific Purposes

This type of animal use is the only one specifically mentioned in the Purposes of the Act and that purpose is to ensure that such use is accountable, open and responsible. Scientific Purposes is defined as per the *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes*, 6th edition 1997 (the Green Code) i.e. if the animal is used: "... in an activity performed to acquire, demonstrate or develop knowledge or a technique in a scientific discipline including:

- * diagnosis
- * environmental studies
- * field trials
- * producing biological products
- * product testing
- * research
- * teaching."

Those who wish to use an animal for scientific purposes in Queensland should be aware of the following provisions of the ACPA which will apply to them:

Registration of Scientific Users
It is an offence to use (or allow use of) animals for scientific purposes in Queensland without appropriate registration with DPI.

The following must register:

- 1. Institutions whose staff and/or students use ani-

mals for scientific purpose. This registration will cover individuals retained by that institution while acting in that capacity. (Retain means employed or engaged, whether or not for remuneration, OR students while in the course of their studies at that institution).

Such retained individuals or students at registered institutions do NOT have to register individually.

- 2. Individuals who are NOT retained by or a student at a registered institution.

As part of the registration process, the registrant will be required to:

- * name each Animal Ethics Committee (AEC) which will be used, and
- * provide the terms of reference for each named AEC.

Registration can be suspended or cancelled if the AEC has not:

- * performed any of its functions under the scientific use code; or
- * complied with the code to the extent it is relevant to the committee.

The Animal Welfare Unit is currently finalizing the registration processes and procedures and database. The Unit

Offence	Penalty Units	Fine / Imprisonment
Cruelty	1000	\$75,000 / 2 years
Breach of Duty of Care	300	\$22,500 / 1 year
Unreasonable abandonment or release	300	\$22,500 / 1 year
Participation in prohibited event (dog fight, coursing, bull fighting, etc.)	300	\$22,500 / 1 year
Being present at a prohibited event	150	\$11,250 / 1 year
Debarking dog, declawing cat, tail docking horse or cow (other than as per regulation)	300	\$22,500 / 1 year
Keep or use animal as kill or lure	300	\$22,500 / 1 year
Failure to comply with animal welfare direction	100	\$ 7,500 / 1 year
Use of an animal for scientific purposes by an unregistered entity	300	\$22,500 / 1 year
Failure of registered scientific user of animals to provide annual report to DPI	150	\$11,250 (no jail)
Use of animal for scientific purposes without AEC approval or Code compliance	300	\$22,500 / 1 year

will contact Institutions about registration over the next few months. Institutions are not required to take any action about registration until contacted.

Restrictions on Scientific Users

It is an offence to use (or allow use of) animals for scientific purposes unless:

- (a) the use is approved by an animal ethics committee whose registered terms of reference includes monitoring the use; and
- (b) any requirements of the committee made under the scientific use code in relation to the use have been complied with; and
- (c) the provisions of the code, to the extent they are relevant to the use, have been complied with.

Reporting

It is an offence for a registered institution or individual not to supply an annual report to DPI containing information which will be prescribed by regulation.

Monitoring

The ACPA provides for the development of monitoring programmes to check for compliance with the scientific use Code. These monitoring programmes will be conducted by specially trained "authorised officers".

While compliance with the scientific use code has been required by regulation in Queensland since 1991, the requirements for registration and reporting and the ability for the administering authority to monitor compliance (as opposed to reactively investigating reports of non-compliance) are new for Queensland. Many other states and territories have had such requirements for a long time. The new requirements have resourcing implications for the Animal Welfare Unit, animal users, Animal Ethics Committees and institutions.

We hope all those affected will work cooperatively with us to get all these new processes running smoothly

and fulfill the Animal Care and Protection Act's purpose of ensuring that the use of animals for scientific purposes is accountable, open and responsible.

Linda B. Murphy
Principal Scientist (Animal Welfare and Ethics)
Animal Welfare Unit
Animal and Plant Health Service
Department of Primary Industries
Queensland Government

Editor's note

Although this article specifically refers to State-based legislation in Australia, it has wide implications for animal welfare and the use on animals for research and teaching in Australia and New Zealand. Linda Murphy was asked, at short notice, to contribute the article to *ANZCCART News* so that it could appear alongside the preliminary announcement of the ANZCCART Conference, which will be held in Queensland later this year.

ANZCCART Conference 2002

Title: *Animal welfare and Animal Ethics Committees:
Where are the goalposts now?*

Venue: Gold Coast International Hotel, Queensland.

Dates: Thursday 17 – Saturday 19
October, 2002

The conference is being especially designed to appeal to, and be valuable for, people concerned with animal welfare in general, and Animal Ethics Committees in particular.

Further information about the conference, including registration and accommodation details, will be posted on the ANZCCART web site:

www.adelaide.edu.au/ANZCCART/

and will appear in the June edition of *ANZCCART News*

Learning, animals and the environment: changing the face of the future

The Proceedings of the conference jointly organised by ANZCCART and the National Animal Ethics Advisory Committee (NAEAC) in Hamilton, New Zealand, in June 2001 are now available for sale from the New Zealand office of ANZCCART for \$40 including GST, postage and packaging.

Attitudes in society seem to be changing from those that Nature is something to be dominated, to something in which human kind should participate, value and nurture. Such relationships are complex, requiring an understanding deeper than that normally acknowledged by adversaries in formal debates. The contributors to *Learning, animals, and the environment—changing the face of the future* explore and map the intricate connections between humans, animals and the environment.

Contributors to these Proceedings reflect and capture the expansive complexity of learning, communicating, and evolving the relationships between the natural world and us. The need to reconnect with that natural world by establishing new, or in some cases re-establish old values, is eloquently put by Gary Reese in *Learning, animals, and the environment—an animal rights perspective*. Sentiments documented as long ago as the 19th Century by George Romanes (1885) and Henry Salt (1892) are now part of our everyday lives. ANZCCART's prestigious *Cam Reid Oration* addressed this vital contribution to social change and though unforeseen circumstances prevented his presentation at the conference, the written paper captures the spirit of the movement.

The first session was devoted to primary and secondary education and considered

how our interaction with animals and the environment has changed and how we might develop better interactions through education.

Barbara Benson pointed out in *Influences on learning*, that young people are most influenced by their families, friends, classmates, what they read, what they see and hear from the media, and probably most importantly, what they observe and interpret from what they see, hear and smell. These influences are not simple—our language can convey both positive and negative messages about animals as well as teach us about human foibles.

The *Consequences of the continuity between the human and biological worlds* were addressed by David Penny. From Descartes and Darwin to the present day Great Ape Project, the change in classification of animals is giving us our values and affecting the way we see animals. Peter Trim's paper discussed the Animals in Schools and Education Trust and its activities.

The second session considered the influences that impinge on the acceptability of animal research and testing and tertiary education, and how we might acknowledge and incorporate them. Frank Griffin, in *Perceptions of biomedical science: Frankenstein or Einstein*, advocates greater involvement of the science community in clear, informed and objective public debate. The contribution of science to New Zealand and Australia will remain compromised unless the value science can bring is clearly enunciated by scientists and shared by the public.

The exciting, rewarding, passionate and incredible side of science was shared by Catherine Morrow in *The next generation of scientists*. Imagine if Ernest Rutherford was as well known as Jonah Lomu! Bruce Baguley began *Alternatives and the future* with two searching questions—have animal experiments led us in the right direction in

anticancer research and can the past help guide us in the future? While we have techniques such as robotic screening of drugs, the animal still seems the best means of understanding the complexity of the relationship between cancer and its host. *The impact of the new Animal Welfare Act 1999* was considered by John Marbrook — challenging us to use statistics and comparisons between humans and animals in experiments, to think beyond the philosophy of replacement, reduction and refinement. My own paper, *Skeletons and sovereigns in the cupboard — learning from our myths* considered how cultural beliefs and expectations, as represented in stories and myths, inform our values and decisions.

The session on the challenges that we could use to build an appropriate learning environment for our future interactions with animals and nature was the theme of the third session. Mark Matfield, and then Kay Weaver addressed *Moving forward with the media*. The need to acknowledge the media's requirements, the strategic intent of the stories and how the audience hear them, and the stereotypes of vivisectionists were some of the topics discussed. While the media are frequently bagged, they in effect Henry Salt (1892) Henry Salt (1892) "sell science" (Nelkin, 1995; Taylor, 2001) suggesting that groups like ANZCCART are not convincingly allaying public concerns regarding the use of animals in science.

In *Democratically modified science*, Ronda Cooper reminds us of the issues surrounding science such as the roles of experts and non-experts, and how we must face the future through more inclusive communication, public participation, accessibility and learning. The importance of people driving change was how Pete Hodgson began *The next Animal Welfare Act*. Future legislation will have to grapple with animal rights, the inclusion of emotional and spiritual dimensions to ani-

mal welfare along with the rational analyses, and again the greater inclusion of the public. John Baldwin asked to what extent do we need to ask *Fish as experimental animals: good for science and fish?* While the benefits of research may accrue to humans and to fish indirectly if their environment is protected as a result, the conclusion "just leave us [fish] alone mate, and don't bugged up our environment" underlies the dilemma facing human use of nature. Finally, in an outstanding presentation, David Scobie addressed the title *Back off man, I'm a scientist*. Capturing the sentiments which others also allude to, this paper deals with the forces which shape the scientist as a human and as a part of the community. A greater acknowledgement of the rightful place of traits such as the emotions, and of the social and economic forces which contribute to the real animal and environmental issues are some of the conclusions reached in this thoughtful and thought-provoking contribution.

The last session focused on how society should move forward in dealing with the regulatory aspects of animals and the environment. Judy McArthur-Clark continued a theme common to many presentations in *Dealing with emerged technologies—benefits and burdens* — the need for those in science to truly understand the public and acknowledge their genuine concerns. Importantly, while many technologies are based on biological knowledge, the real challenge will be in understanding and managing the systems in which they will be used. Donald Hannah reminded us of the legal requirements in *Living with the legislation*. There remain significant dilemmas and challenges in managing risk to ensure the health and safety of people and communities. The difficulties of using legislation to decide ethical issues was noted and Barbara Nicholas further addressed this in *Care beyond regulation*. Public discussion is an integral part of the process of sci-

ence and the challenge is in how we live with diversity and value diverse world-views. As different people frame things in different ways, we need to seek common language and meaning in reaching a true understanding of each other.

In dealing with controversial subjects such as animal experimentation, individuals and interest groups understandably rely heavily on examples to support their argumentative strategies (Lafollette and Shanks, 1996). This approach inevitably leads to confrontation and the success of the best debater or most powerful interest. What is needed is a deeper understanding of the paradigms upon which we base such positions. In understanding them and challenging our beliefs, this Proceedings will be valuable to anyone interested in how we learn, communicate and evolve the relationships between ourselves and the natural world. They will be of special interest to those involved in education and science, and to those interested in teaching, animal welfare, the environment, ethics, and the communication and regulations of community expectations. Use this Proceedings to challenge your own thinking and of those around you—only by of humans, animals and the environment.

*One impulse from a vernal wood
May teach you more of man,
Of moral evil and of good,
Than all the sages can.*

*Sweet is the lore which Nature
brings;
Our meddling intellect
Mis-shapes the beauteous forms
of things:-
We murder to dissect.*

*Enough of Science and of Art;
Close up those barren leaves;
Come forth and bring with a
heart
That watches and receives.*

William Wordsworth

Mark Fisher
ANZCCART (NZ)
AgResearch Poukawa
Havelock North
New Zealand

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Coming up

Australian Veterinary
Association
Annual Conference
Adelaide
6-10 May, 2002

Includes two day program
by AVERT on animal
ethics issues.

For further information,
contact:

avacos@ava.com.au
Tel: 02-6273-8855
Fax: 02-6273-8899

International course on
laboratory animal
science
27 May - 7 June 2002
Utrecht, Netherlands

Details from:
Professor L.F.M. van
Zutphen
Faculty of Veterinary
Medicine
University of Utrecht
PO Box 80.166,
3508 TD Utrecht
Netherlands
Fax: 31 30 153 7997
email: pdk@las.vet.uu.nl

Australian Society for
Animal Production
Conference
*Finding the balance -
profitability with
responsibility*
Adelaide
7-11 July, 2002

Contact: Thomas Banhazi
Tel: 08 8303 7781
Fax: 08 8303 7975

email:
Banhazi.Thomas@saugov
.sa.gov.au

Fourth World Congress
on alternatives and
animal use in the life
sciences
New Orleans, USA
11-15 August, 2002

email: dpease@hsus.org

website: www.world
congress.net/

News

AVERT Conference

If you wish to attend the Australian Veterinarians in Ethics, Research and Teaching (AVERT) Conference (7-8 May, 2002, Adelaide, Australia) to be held in association with the Australian Veterinary Association, and if you are NOT a veterinarian, your daily registration fee will be as for the "standard registration" category.

The registration form and general details about the conference are available from the AVA website: www.ava.com.au/

Latest ILAR journal-

Mouse models of human disease

The theme of the latest edition of the Institute for Laboratory Animal Research Journal *ILAR* (Vol. 43: 2, 2002) is *Mouse models of human disease*. The journal contains a number of excellent articles, including those listed below:

- * *The Mousetrap: What can we learn when the mouse model does not mimic the human disease?* (Sarah Elsea and Rebecca Williams).
- * *Mouse models of Alzheimer's disease: A quest for plaques and tangles* (James Richardson and Dennis Burns).
- * *Complexities of cancer research: Mouse genetic models* (Kent Hunter and Robert Williams).
- * *Welfare issues of genetically modified animals* (Melvin Dennis).

2002 Russell and Burch Award

The Humane Society of the United States (HSUS) is currently seeking nominations for the 2002 *Russell and Burch Award*. The award is presented on an annual basis to "scientists who have made outstanding contributions toward the advancement of alternative methods in the areas of biomedical research, testing and higher education". Alternative methods are those that can *replace* or *reduce* the use of animals, or *refine* procedures so that animals experience less pain or suffering.

The award, which carries a prize of US\$5,000, is given in honour of the two scientists who introduced the concept of "the three Rs" - replacement, reduction and refinement - a concept strongly supported by ANZCCART.

Nominations for this important award close 15 May 2002. Additional information can be obtained from:

Gina Alvino
Information Specialist
HSUS
email: ari@hsus.org

Animal Research News and Analysis

Animal Research News and Analysis is an electronic newsletter produced and distributed periodically by the Animal Research Issues section of the Humane Society of the United States (HSUS). The aim of the publication is to provide interested parties with up-to-date news and interpretative analyses on the use of animals in research, testing and education.

Further details can be obtained from the web site www.hsus.org/act/11348

New Zealand Conference on Animal Welfare

A conference entitled *Animal Welfare: From Science to Solution* will be held in Hamilton, New Zealand on 27-28 June 2002.

The conference hosts are the National Animal Welfare Advisory Committee (NAWAC), the International Society for Applied Ethology (Australasian Region) and the Ministry of Agriculture and Forestry (MAF).

Amongst the topics listed for discussion are:

- * How scientific investigations can advance animal welfare.
- * Humane management methods for wildlife.
- * Novel non-invasive measures of animal welfare
- * Genetic manipulation, cloning and animal welfare.

For further information contact

Yvette.hobbs@agresearch.co.nz

Fax: 07 838 5038

Human research ethics

Readers of this newsletter will be interested to know that the NHMRC publication *National Statement on Ethical Conduct in Research Involving Humans* is available electronically from the website:

www.health.gov.au/nhmrc/publications/synopses/

Assessing pain in animals

A very interesting article, "Assessing Pain in Animals" by Kenneth Rutherford, has appeared in the recent issue of the Journal *Animal Welfare* (2002) 11: 31-53. Rutherford reviews some approaches to pain assessment including the use of multi-dimensional pain scales, and he points to the value of using these measurements in allowing informed debate on animal welfare issues.

ANZCCART News is published quarterly by the Australian and New Zealand Council for the Care of Animals in Research and Teaching Limited.

It is a publication for researchers and teachers; members of animal ethics committees; staff of organisations concerned with research, teaching and funding; and parliamentarians and members of the public with interests in the conduct of animal-based research and teaching and the welfare of animals so used.

Contributions to ANZCCART News are welcomed and should be sent to:

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