Ministry for Primary Industries
Manatū Ahu Matua

Welfare Pulse

Animal welfare in New Zealand and around the world

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Extensive farm animal welfare

Extensive farming involves husbandry of animals over a large area, usually with relatively low levels of inputs, labour and resources and typically, in variable climates, and rugged or remote terrain.

Animals, often with diverse characteristics such as different strains and breeds adapted to different locales, have space and behavioural freedom but are prone to the vagaries of climate and the environment from which they usually get all or most of their resources.

One of the overriding influences on extensive farming is its ecological foundation – productivity is dependent on managing grazing in time and space within the constraints imposed by variations in climate and terrain. While humans control and manipulate extensively farmed animals, the environment dictates aspects of their performance, health and welfare.

Beef cattle, sheep, deer and goats have some of the attributes of free-living or wild animals. Although having choice of diet and considerable freedom of movement and behaviour, they are under some degree of human management. For example, social and kin structure may be distorted by culling and grouping, parental care of young may be curtailed by weaning, and animals are usually less subject to predation and natural selection but increased artificial selection. Changes to pastures, animals and management are commonly used to minimise ecological constraints and improve animal and farm productivity and efficiency.

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Extensively farmed beef cattle in New Zealand's South Island high country. (Photo courtesy of Mark Fisher)

Stockmanship is widely regarded as important to the welfare of animals in any farming system. In extensive systems, stockmanship has three interrelated aspects. Firstly, individuals typically draw on a lifetime of practical personal experiences and learning with animals and farming. They have an intuitive feel for the essence of the animal. Secondly, personal qualities of patience and empathy are traits or attitudes considered necessary when working with and being responsible for animals. Finally, an understanding of the constraints and opportunities afforded by the physical environment including the climate, the terrain and the biota.

Good extensive farm animal welfare might be ensured by giving attention to the following seven general principles.

1. Always ensuring animals and farming systems have adequate reserves to enable animals to cope with their changing and variable environments.
2. Ensuring animals are genetically suited and acclimatised to the environment and the production system.
3. Valuing and using the practical knowledge and experience people have of the interaction between the land, the animals and the people which give extensive farming its ethos.
4. Keeping the land, the climate, the animals and farm management expectations in equilibrium.
5. Providing the right environments, resources, and management for animals in order that they can "Fend for themselves".
6. Attending to or minimising those aspects known to have a risk for animal welfare, and which are controllable, so that livestock can direct their resources or adapt to the stressors beyond the control of farm management.
7. Facilitating and encouraging those with responsibilities for the care of animals to have the time, opportunities and confidence to achieve these aims.

Good extensive farm animal welfare raises a number of interesting questions. As they inhabit a variable environment, are extensively farmed animals better at adapting to stressors? A rich and diverse environment presenting the animal with the opportunity to explore, one of an animal's basic needs, may prepare it to better deal with challenges in its environment and in interactions with humans. Similarly, do extensive animal farmers have a broad understanding and depth of risk management strategies necessary for farming efficiently? If good extensive farming is good for animals, is it also good for humans? Does it provide a reminder of human fallibility; that technology and good practice cannot solve everything?

Viewing extensive and intensive farm animal welfare from the same perspective may ignore their fundamental differences. The former is constrained by ecology where the environment dictates some aspects of animal husbandry, the latter has sought to remove or at least limit those ecological constraints. While essentially the same animal must adapt to either system, what welfare compromises are deemed as necessary and reasonable by society in order for humans to benefit, can be different.

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This article is an abridged version of a paper presented to the New Zealand Society of Animal Production **(http://www.nzsap.org/system/files/proceedings/2011/ab11042.pdf).**

Animal Ethics Committee Service Award

Animal ethics committee (AEC) service awards are given by the National Animal Ethics Advisory Committee (NAEAC) in recognition of "meritorious service for at least five years on the basis of outstanding contributions to the AEC on which a nominee has served". The National Animal Ethics Advisory Committee made an award in late 2014 to Colin Scurr.

Colin served on AgResearch's Invermay Animal Ethics Committee for 10 and a half years. He was originally the regional council's nominee and remained on the committee after that term as a community representative.

The award was presented by NAEAC member Stephen Cairns, at the last AEC meeting of 2014 to mark Colin's retirement from the committee. AEC Chairman, Grant Shackell, commented that Colin was a strong animal welfare advocate whose farming experience was most valuable.

Colin Scurr (left) receiving his award from NAEAC member Stephen Cairns.

Nominations

AECs or their institutions are welcome to submit nominations to NAEAC at any time for AEC Service Awards for members who have made an outstanding contribution. Names of those receiving awards are published only with their agreement.

Using a transparent fish in biomedical research

"Zebra danios" or zebrafish are a popular small tropical freshwater fish used widely in home aquaria. Pet shops often suggest these as a starter fish as they are inexpensive and undemanding for the novice fish keeper.

In the wild, zebrafish are broadly distributed in India and throughout Asia. In the 1970s the potential for zebrafish to be used in biomedical research began to be recognised. Since then this system has grown in its use in universities and research institutes around the world, with around 600 laboratories using the system internationally, including approximately 20 groups in Australia and New Zealand.

These fish are playing a significant and often unexpected role in biomedical research. Despite a very long evolutionary separation between mammals and bony fish like zebrafish (they are the same type of fish as trout and salmon), zebrafish have remarkable overall similarities to mammals. They have a backbone, brain and spinal cord, in addition to the other organs we have such as liver, kidney, pancreas, intestine and blood. Compelling features of zebrafish are that development proceeds rapidly (the organs emerge and function within a few days) and these processes are easily visualised in the fully transparent embryos. With simple microscopy, investigators can view all of the cells and tissues growing and moving within a whole living vertebrate, without the need for invasive techniques or euthanasia.

Another significant advantage is that a pair of zebrafish can produce hundreds of fertilised embryos each week and growth of these is external to the mother. A further notable feature is at the level of the DNA. When comparing the genomes of zebrafish, humans and mice there is very significant overlap of structural features. About 85 percent of human disease genes have a zebrafish counterpart and there is clear evolutionary conservation of important biological processes at a genetic level. These features have collectively made the zebrafish a great animal to use for biomedical research.

The range of research being undertaken using zebrafish is now very exciting and expansive. Importantly, investigators have contributed to some ground-breaking discoveries that have impacted on understanding not only fundamental biological processes occurring during embryogenesis, but have provided insights into the genetic basis of many human diseases. Examples of these insights include understanding how iron metabolism is regulated in cells, how heart and muscle cells regenerate following injury, insights into how cancer develops, how different stem cell populations function in organ regeneration and how inflammation is linked to metabolic processes.

One remarkable area that has taken-off in the zebrafish field is the use of the system in drug discovery. Zebrafish embryos can be placed in their tank water in small plastic dishes, followed by addition of small-molecule drug libraries and then the effects of those drugs measured over time. Drugs discovered using the zebrafish are already in clinical trial. The first of these is being used to expand blood stem cell numbers prior to transplantation and the second is a known arthritis drug that is being used in a new combination therapy for advanced melanoma.

It's an exciting time to be using this system in biomedical research. Use of the zebrafish will continue and expand into unexpected areas, making this small home aquarium fish take a prime position in the biomedical scientist's toolkit.

Phil Crosier
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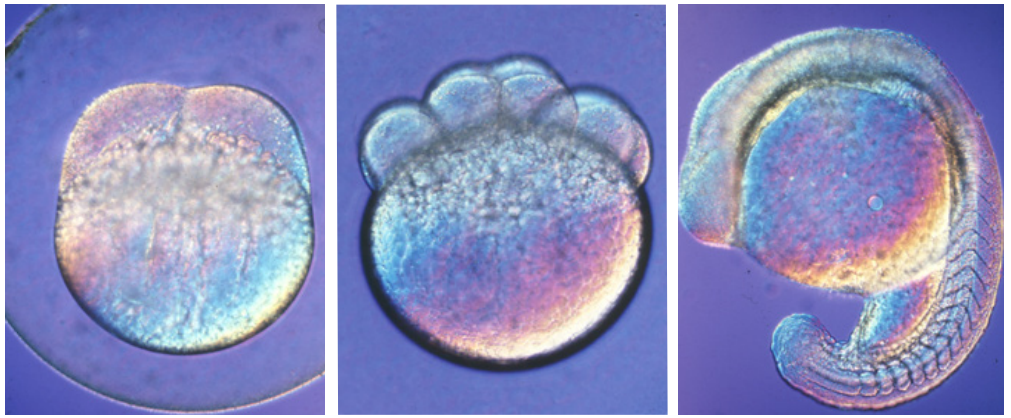
Zebrafish embryos (2 cell stage, 8 cell stage, 24 hours post-fertilisation) and adult. Photos courtesy of *Understanding Animal Research*.



National Animal Ethics Advisory Committee Three Rs Award

A Massey University scientist has been honoured for his work in refining the ways animals are used in scientific research, testing and teaching.

The 2014 National Animal Ethics Advisory Committee (NAEAC) Three Rs Award, sponsored by the Royal New Zealand SPCA, was presented to Professor David Mellor in recognition of his contribution to humane science in New Zealand and the practical application of the Three Rs.

"The concept of the Three Rs, from which the award takes its name, is to replace and reduce the number of animals used in research, testing and teaching, and refine experimental techniques to minimise pain or distress," says NAEAC Deputy Chair Dr Peter Larsen.

"Professor Mellor's development of the 'Five Domains' model has extended our concept of refinement and provided the animal welfare community with a tool to assess not only the physical wellbeing of animals, but also their emotional and mental states.

"The model measures animals' welfare from a much broader point of view and recognises the importance of not only minimising negative impacts to animals, but also promoting positive welfare outcomes," says Dr Larsen.

Royal New Zealand SPCA Chief Executive, Ric Odom, says the SPCA is proud to sponsor the award, which significantly contributes to promoting the concept of the Three Rs within the scientific community and to the wider public.

David Mellor receiving his award from NAEAC Chairperson Virginia Williams.

"Before an animal is used in research, teaching or testing, the benefits of that activity need to be considered against any harm that animal experiences – and Professor Mellor's work has been integral to how that's considered, both in New Zealand and internationally," he says.

The Three Rs award is co-ordinated by NAEAC and made annually to an individual, group, or institution within New Zealand that best of embodies the principles of the Three Rs.

The National Animal Ethics Advisory Committee (NAEAC) invites applications or nominations for the:

THREE Rs AWARD 2015

To reward and promote implementation of Three Rs principles in research, testing and teaching

The Three Rs (replacement, reduction and refinement) are the cornerstone of the ethical use of animals in research, testing and teaching. This award celebrates achievements in the implementation of the Three Rs and promotes the concept within the scientific community and to the wider public.

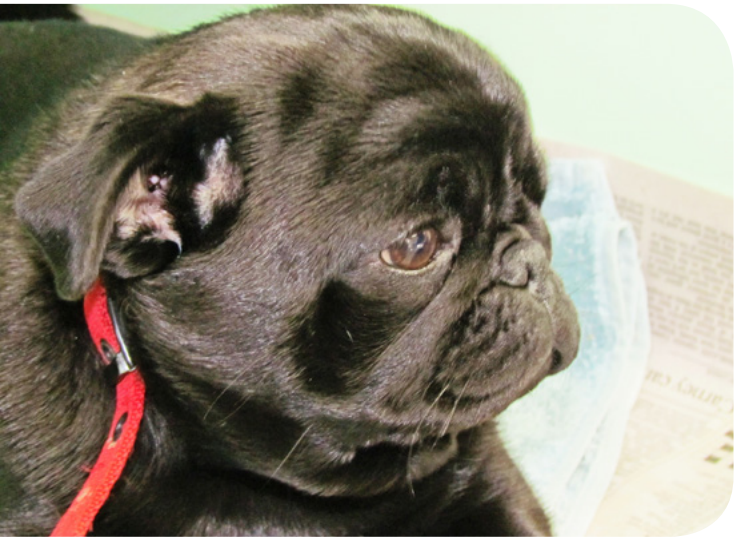
The award is co-ordinated by NAEAC and is made to an individual, group or institution within New Zealand that shows great commitment to, or innovative implementation of, the Three Rs, or whose work will help to promote awareness of Three Rs principles.

The prize will consist of a certificate and a financial award which will be presented at an appropriate formal occasion later this year. Receipt of the award will be publicised in selected media, although specific details of the work involved can be restricted if appropriate.

Please contact the NAEAC Secretariat via email **(naeac@mpi.govt.nz)** for an application form.

Applications close on **Friday 24 July 2015**.

Breeding dogs with welfare in mind



The idea that animal breeding has raised some welfare issues is not a new idea and has been discussed in veterinary literature for some time.

Papers were published back in the in the 1970s about welfare concerns associated with dog breeding. The dog has probably had the most human interference, with the modern dog being hardly recognisable as descending from the wolf.

Over all species, the breed standards that have been accepted throughout the breeding world will often include traits that lean more towards a particular look rather than how the animal functions. The brachycephalic animal is a classic example where the breed standards require a shortening of the maxilla at the expense of the animal being able to breathe properly.

The Animal Welfare Act in New Zealand gives the person in charge of the animal responsibility for ensuring the welfare needs of their animals are met. Breeding an animal that is likely to be affected by an inherited disorder or a breed standard that rewards poor function eg brachycephalic characteristics is not fulfilling this requirement.

Five major problems with breeding practices have been described:

1. Some breed standards and selection practices do not take welfare impact into account.
2. There is little selection pressure on some traits that would improve animal welfare.
3. The incidence of some inherited defects in some breeds is unacceptably high.
4. The number of registered animals of certain breeds is so low as to make it almost impossible to avoid close relative matings.
5. There may be financial disincentives for breeders and veterinarians to reduce the incidence of inherited defects.

A review of dog breeding made the following suggestions:

1. Sound scientific data needs to be available to guide decisions and advice.
2. The primary goal of breeders and judges should be the welfare of the individuals as well as the breed as a whole, and cosmetic or breed specific criteria are secondary.
3. Breeders should be able and willing to use the scientific data to guide their breeding decisions to achieve welfare objectives and reduce inbreeding.
4. The veterinary profession should combine preventative advice with remedial and curative work as well as providing screening programmes.
5. Consumers need to be educated and informed in their approach to selecting a breed and an individual, and encouraged to avoid breeders who compromise welfare.

There is a move towards developing a database of inherited disorders in Australia, and in the UK a database called VetCompass (**http://www.rvc.ac.uk/vetcompass**) has been collating this information since 2007. Information is useful to determine the extent of the issue and to identify areas where the focus should be. There is a lot of information on breed predispositions to certain inherited disorders but there is little on the actual prevalence of these disorders.

Karen Phillips.

In the UK, an independent Advisory Council on the welfare issues of dog breeding has been developed in response to a call by three separate reports ('Pedigree dog breeding in the UK: a major welfare concern?' Commissioned by the RSPCA, 'A healthier future for pedigree dogs' from the Associate Parliamentary Group for Animal Welfare, and the 'Independent inquiry into dog breeding') to provide advice on the issues. This Council has come up with multiple recommendations for Government involving regulation and non regulatory plans. The stakeholders include the breeders, the Kennel Club, judges of dog shows, veterinarians and purchasers of dogs. A combination of data collection, training, education and regulation is suggested to be used to change perceptions and beliefs in the dog world.

Prevalence data is needed to determine the scale of inherited defects in each species. From there a risk analysis of the inherited diseases found within a species would give an indication of welfare impact. This information could be used as a tool to identify priorities and provide a starting point and a plan to overcoming the associated issues – breaking the problem into smaller parts, allowing decision makers to determine where to focus their resources. A Breed-Disorder Welfare Impact Score has been developed which aims to

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objectively prioritise different welfare problems and help develop strategies to deal with them. This scoring system takes into account the severity of the disorder, the prevalence and the proportion of the animal's life that it is affected.

To improve the level of welfare in pedigree animals, there needs to be co-operation between the breeders, the judges, the governing body for the breed, veterinarians, geneticists, and the public purchasing these animals. Enabling these groups to see certain breed standards as being contrary to good welfare must be the priority, and then changing these standards to encourage better welfare should follow. Judges rewarding animals that show welfare friendly traits, and having a simple veterinary check at shows to ensure inherited defects are not winning will both help improve the welfare of pedigree animals. Evaluation of breed standards as related to welfare impacts would be a good starting point for most pedigree members of a species and has been recommended by the three reports into pedigree dog breeding in the UK. Allowing outcrossing to another breed to remove an undesirable trait without penalising the breeder, is another strategy that can be used to improve breeds.

The use of popular sires is a well recognised problem in breeding practices and leads to a smaller genetic pool and the spread of inherited defects. Inbreeding (also known as line breeding by breeders) is an area that can be easily monitored through pedigree analysis and the registration process of the breed societies. Limiting the number of offspring per single animal is a means to reduce the genetic pressure on that individual's genes.

The development of specific strategies to deal with inherited disorders will depend on the prevalence, severity, mode of inheritance as well as the ability to test for these defects and preventative measures available.

In Victoria, Australia, breeders are regulated and breeding programmes must be able to justify using high risk groups and any affected animals must be either destroyed or prevented from breeding in the future. Guidance on breeding programmes and advice on other options for breeders considering high risk breeding would be another strategy to reduce the welfare impacts.

The issue of inherited defects is a complex one and needs co-operation from all stake holders to acknowledge the problems and form a multi pronged strategy to address these issues.

Karen Phillips
Veterinarian

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Farrowing systems to provide for the welfare of sows and piglets

The New Zealand pork industry is tiny compared to our international competitors. One of its unique characteristics is that over 40 percent of sows are farmed outdoors.

Outdoor breeding is possible because parts of the country (Canterbury and South Canterbury in particular) have a temperate climate, low rainfall (600-800 mm), free draining soil conditions, access to straw and the ability to be incorporated in an arable crop rotation.

In outdoor systems generally, the sow farrows (gives birth) individually in a hut or ark. At this time sows are very protective of their piglets and can be quite aggressive towards staff. While the straw bed that is provided for the sows and piglets in the farrowing hut provides some thermal comfort, the piglet mortality in these systems is higher than that in systems using farrowing crates. Recent New Zealand benchmarking data for two years shows pre-weaning mortality outdoors of 20.1 percent and 19.1 percent; compared to indoors, 14.1 percent and 12.9 percent.

In contrast to outdoor breeding systems, indoor farms use a farrowing crate which has been adopted by pig producing countries over the last five decades. A farrowing crate system is where sows are kept individually during and after farrowing, and these crates prevent sows from turning around. A system using farrowing crates has a number of benefits, notably lower piglet mortality, the stockperson safely caring for the sow and her piglets, providing care and medical attention without upsetting the sow or distressing the piglets, and relatively easily keeping it clean.

Notwithstanding these benefits, more recently there has been criticism of farrowing crate systems, in that sow movement is restricted and her maternal behaviour is limited. A major criticism is the inability to exhibit 'nest building' behaviour at farrowing time.

Research continues to investigate less restrictive systems for the sow that retain the benefits of the crate, and are commercially viable. Any viable option must address the 'triangle of conflicting needs' between the sow, the piglets and the farmer/stockperson.

Examples illustrating the conflicting needs are:

- The use of a farrowing crate, while reducing the risk of the sow squashing the piglets, provides good temperature differential between sows and piglets, easy access for observation and attention to the sow and piglets, control of feeding, enabling fostering of piglets and protecting farm staff. However, it also limits elements of the sow's natural behaviours and restricts her movement.
- Farrowing pens contain a creep area, and may contain a farrowing crate or similar structure for confinement of the sow. Providing the sow with more space in a farrowing pen will allow her to have greater movement and to exhibit behaviour such as 'nest building'. However, the less

Ian Barugh

Ian has been involved in the New Zealand pork industry for many years. He purchased his first sow when he was 12 and, since then, has been involved in both managing pork production on-farm, conducting research into different aspects of pork production and also working in an advisory role as a consultant. For the last 20 years he has provided Technical Advice for NZPork staff, producers, nutritionists, veterinarians and other personnel servicing the pork industry.

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Typical farrowing crates.

protection for the piglets that these systems offer may result in higher death rates for piglets. A New Zealand on-farm PhD study comparing the performance of a farrowing crate to a farrowing pen showed pre-weaning mortality in the crate of 6.14 percent and that in the pen of 11.32 percent. There is a safety issue for staff in handling and managing sows while undertaking routine husbandry tasks.

From a production point of view, the objective with any farrowing system is to maximise the output of healthy, heavy weaners as economically as possible, and to ensure that the sow has a long reproductive life.

"Success" of any farrowing system can be readily measured by:

- Low still births – less than 5 percent.
- Low piglet mortality – less than 10 percent.
- Large numbers weaned per litter – more than 11.
- Weaning healthy, heavy for age weaners.
- Sows weaned in good condition.
- Good subsequent sow performance.
- Ease of operation by staff.
- Achievable at a realistic capital and operational cost.

As well as the welfare components, a farrowing system needs to consider a number of operational factors, including the ability to operate on an "all in, all out" basis. "All in, all out" is a production system where pigs are moved in and out of facilities in distinct groups, usually on an age basis. This system allows the correct temperature and feed to be provided to the pigs, as well as the same management and husbandry to occur, and allows facilities to be thoroughly disinfected between batches of pigs.

The facility used must allow sows to stand up and lie down comfortably, ensure freedom of injury to both the sow and her litter, minimise overlaying of piglets, allow for easy feeding so that each sow receives appropriate nutrition, be manufactured

Piglet heating showing, top, heat lamp over solid floor, and on the bottom, straw bed for outdoor piglets.

from strong materials, which are easy to clean and last well. In addition, the facility must be insulated, ventilated, warm, dry, draught-free and have the ability to create different temperatures in a small space e.g. sows require 20° C and newly born piglets 35° C. The system must also allow the sow to comfortably suckle piglets and to give piglets' easy access to the sow's udder. This will require a non-slip floor, the ability for the sow to lie down comfortably, to make a 'nest' and be

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hygienic. Staff also need to be able to move stock in and out of the facility, have easy access and control of both the sow and litter and be able to handle sows to perform routine husbandry and management tasks in a safe and timely manner at a time sows can be aggressive in protecting their litter.

There are several ways of heating to create the different temperatures required between sows and piglets. Methods include the use of heat lamps or bulbs, under floor heating and heat pads, allied to creep boxes and draught barriers to create the required temperature needed. The use of bedding material in the form of shredded paper, wood shavings, sawdust and straw outdoors improves the thermal comfort for piglets by assisting them to dry off at farrowing and to provide an insulated layer to sleep on.

In addition to providing a non-slip, comfortable surface the flooring system must provide good thermal comfort for sows and litter, a clean surface for sows and be readily cleaned and sanitised.

All in all, this is not a simple task!

Research is now specifying requirements for commercial companies to develop various types of farrowing systems taking into account the welfare needs of the sow, piglets and stockperson, as well as the practical factors required for operational success. Obviously any change in system has a major capital requirement, both for the system and space as well as on-going running costs.

Recent research undertaken on a New Zealand farm comparing farrowing crates to farrowing pens, demonstrates that piglet mortality remains higher in the pen system, although good compared to the New Zealand industry average. Piglets were however heavier when weaned from the pens than the crates, a possible indicator of improved sow comfort.

Good operators, skilled staff and appropriate management and husbandry are critical to the success of any system and especially so when implementing a new system.

Ian Barugh

Technical Advisor NZPork

Examples of loose farrowing pens – on the left, PigSafe and on the right, a Danish prototype.

Appointments to NAWAC

In December 2014, the Minister for Primary Industries appointed Dr Julie Wagner to the National Animal Welfare Advisory Committee and reappointed Dr Penny Fisher for a second term.

Julie Wagner replaced Dr Karen Phillips who had served on the committee for six years and been Deputy Chairperson for the last three years. Julie is a veterinarian currently employed as Product Manager Animal Health for Ravensdown Fertiliser Co-operative Ltd. She has previously worked in rural mixed veterinary practices and in the animal health industry. In addition, Julie was a member of the Veterinary Council of New Zealand for 12 years and was Deputy Chairperson for part of that time. She is also involved in the Akaroa Civil Defence.

Penny Fisher was originally nominated by Landcare Research NZ Ltd and provides knowledge and experience of environmental and conservation management. Her current role is Research Leader Wildlife Ecology and Management. Her research expertise includes invasive animal management and the toxicology and environmental effects of vertebrate pesticides.

What does it mean to give an animal a good death?

Man has had a long relationship with animals. Initially this involved hunting for food and other useful materials, but as animals have become domesticated, this relationship has grown more varied and intimate.

A more or less universal feature of the relationship is that we are responsible for the timing and nature of the animal's death. One of the major threads of animal welfare research investigates the ways in which we kill animals and makes continued efforts to achieve as good a death as possible.

The process of death

Death is a process by which an organism moves from a state of normal physiological function to a state in which it no longer functions and its body begins to decay. This process involves many components that follow on from each other - an example is given in the figure below. At some point during the process,

the animal's cognitive functions become altered such that it becomes unaware of its surroundings. This is an important part of the process, because the animal can only undergo experiences prior to this point. Anything happening before the animal becomes unaware for the last time can contribute to its welfare, but anything happening after this point can have no effect on welfare.

Perceptions of animal death

Many factors influence public acceptance of killing animals. For example, killing very young or cute animals or animals of a species that a given culture is particularly fond of may engender very different responses to killing adults or animals of a species that is subject to cultural denigration. The tidiness of the killing method – a lethal injection where animals 'peacefully go to sleep' may be favoured over more mechanical methods where part of the animal is physically destroyed. Similarly, the extent to which the need for killing the animal is understood. When the reasons for killing are well explained and where other potential options appear to have been explored and found to be unsuitable, people are often more accepting. From time to time, adverse publicity surrounding a particular killing method can quickly and profoundly alter the public's perception of the use of animals in a particular way. This is especially apparent when cultural or historical links are made to a killing method or that killing method is described using emotive language.

The different perceptions of killing and killing methods is important if our use of animals is to remain socially sustainable. However, the basis on which public opinion is formed is not usually a good foundation for making objective judgements as to the suitability of a particular method in a given situation.

Assessing a good death

A number of factors play a role in the quality of an animal's death. Many deaths will have a benefit either to the animal itself, for example, when euthanasia is carried out to relieve suffering from an untreatable disease, to other animals, for example when pest control is carried out to protect wildlife habitat, or to humans, for example when slaughtering animals for food.

There are three closely inter-related domains that are important in deciding if a killing method can be considered a good one: the experience of the animal up to the point of loss of awareness; the duration of the process up to the point of loss of awareness; the aesthetic nature of the killing method.

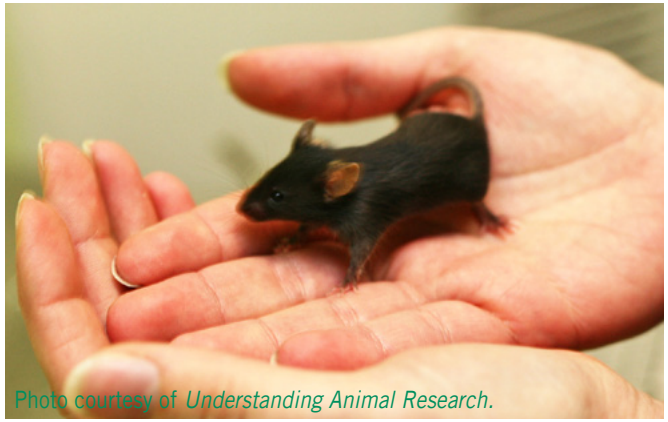

Photo courtesy of *Understanding Animal Research.*

Experience of the animal: Prior to loss of awareness, the animal should be presented with as few negative stimuli as possible. Negative stimuli can be considered in a broad sense (including drafting, transport etc.), or more narrowly to only include stimuli that directly relate to the killing method used. Negative stimuli may actually be noxious and so constitute a direct risk that the animal will be in pain, or they may stress the animal thereby increasing its anxiety and inducing negative states of mind.

Duration of the process: Methods of killing that ensure that the animal loses awareness as quickly as possible should be preferred. When using these techniques, there is very

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little time for any negative stimuli that may be perceived by the animal to have a negative impact on its welfare. Those instantaneous methods that live up to this standard most reliably are physical techniques that rapidly destroy the higher centres of the central nervous system.

Aesthetics of the process: Killing an animal has an effect both on the animal being killed and on the people undertaking or observing the act of killing it. Involvement with killing animals, especially in large numbers and over extended periods of time, can cause serious psychological harm and may constitute an employment risk that should be managed under Health and Safety Legislation. People working with animals in these situations often mention a number of aspects that can make them uncomfortable. In general, most people working with animals in this way report that the more aesthetically acceptable the process is, the less uncomfortable they feel being involved with it. Aesthetics can itself have a number of aspects including intimacy of contact with the animal during the process, physicality of the chosen technique and personal or cultural associations which the person may have with the method of killing. Whilst aesthetics are an important consideration, care should be taken that they do not outweigh the experience of the animal as this can compromise welfare.

Conclusions

Decisions about the most appropriate way to kill animals in different circumstances are often complex and can be influenced by many factors. Analysis of the proposed technique in terms of experience of the animal, time to loss of awareness and aesthetic acceptability can help to determine optimal killing techniques in different circumstances.

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Codes of ethical conduct – approvals, notifications and terminations since *Welfare Pulse issue 17*

All organisations involved in the use of live animals for research, testing or teaching are required to adhere to an approved code of ethical conduct.

Codes of ethical conduct approved

- Department of Conservation
- Diatranz Otsuka Ltd
- Eastern Institute of Technology
- National Institute of Water and Atmospheric Research Ltd
- Nelson Marlborough Institute of Technology
- New Zealand Association of Science Educators
- Southern Institute of Technology
- University of Waikato

Transfer of code approved

- From Living Cell Technologies New Zealand Ltd to Diatranz Otsuka Ltd
- From Thermo Fisher Scientific Tauranga Ltd to GE Healthcare Tauranga Ltd

Amendments to code of ethical conduct approved

- Diatranz Otsuka Ltd

Notifications to MPI of arrangements to use an existing code of ethical conduct

- Baker & Associates Ltd (to use AgResearch Ltd's code)
- Cawthron Institute (to use Nelson Marlborough Institute of Technology's code) (renewal – code expired)
- Herdwash Ltd (to use AgResearch Ltd's code)
- Hillcrest High School (to use University of Waikato's code) (renewal – code expired)
- Institute of Environmental Science and Research Ltd (to use University of Otago's code)
- InterAg (to use University of Waikato's code)
- Living Cell Technologies New Zealand Ltd (to use Diatranz Otsuka Ltd's code)
- Matamata Veterinary Services (to use Estendart Ltd's code)
- Medical Plus New Zealand (to use Estendart Ltd's code)
- Merial New Zealand Ltd (to use PharmVet Solutions' code)
- National Trade Academy (to use Lincoln University's code)
- New Zealand Institute for Plant and Food Research Ltd – Lincoln (to use National Institute of Water and Atmospheric Research Ltd's code) (renewal – code expired)
- New Zealand Institute for Plant and Food Research Ltd – Nelson (to use Nelson Marlborough Institute of Technology 's code) (renewal – code expired)
- SBScibus Ltd (to use AgResearch Ltd's code)

Codes of ethical conduct revoked or expired or arrangements terminated or lapsed

- FarmSense (NZ) Ltd
- Living Cell Technologies NZ Ltd
- New Zealand Forest Research Institute Ltd

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Laboratory Animal Accreditation

In 2014, the Animal Care Services department within the University of Western Australia became the first institution in Australasia to gain accreditation from the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC, www.aaalac.org).

AAALAC is a private, non-profit organisation that promotes the humane treatment of animals in research, testing and teaching through voluntary assessment and accreditation programmes. The accreditation process is extremely thorough. Malcolm Lawson, Animal Care Services Director, says he found the AAALAC experience challenging. "Firstly, you have to get your teams together. By this I mean that Animal Care Services had to have robust processes and procedures; we had to have a strong and well regarded veterinary influence; we needed good communication and relations with the animal ethics committees (AECs) and welfare advocates; and we had to have the necessary infrastructure and executive support from the university to do this." These internal challenges helped them focus on what it was that they were hoping to achieve.

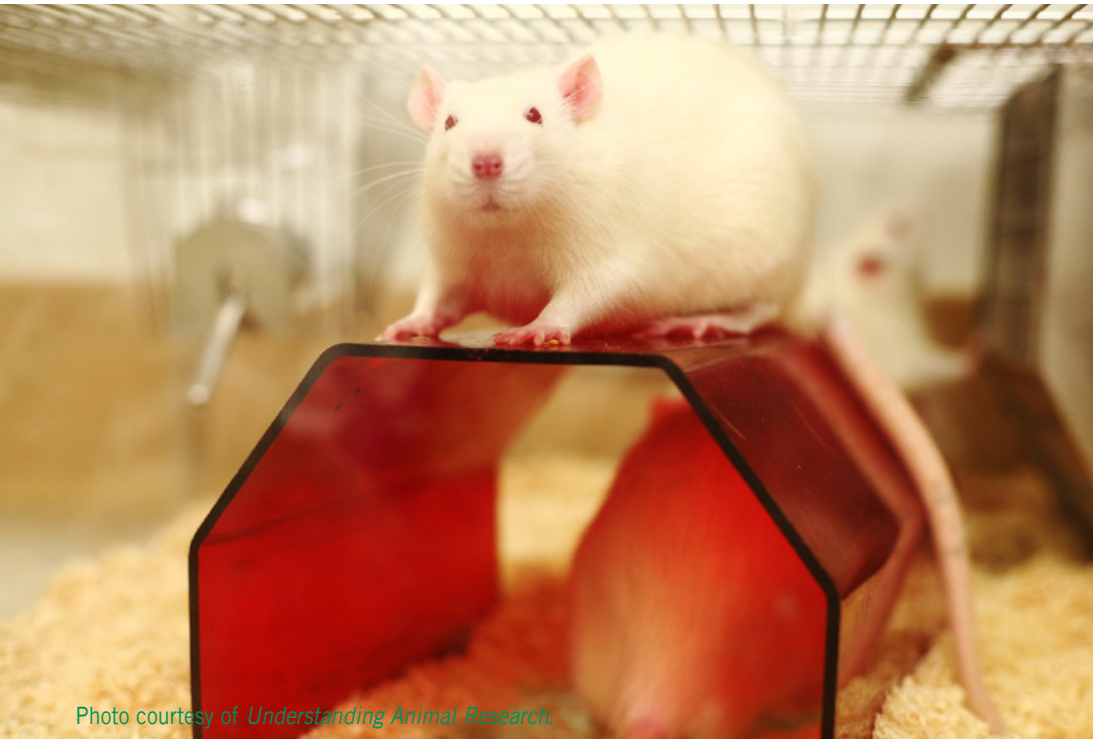

Photo courtesy of *Understanding Animal Research*.

The second challenge, he said, was to be able to confidently present the programme in a voluntary way to their industry peers, and be prepared both to take criticism and to take this on board to improve whatever the deficiency might be.

"The AAALAC process provided me and the Animal Care Services team an opportunity and challenge to draw together what we knew were good systems, good facilities, good husbandry and good care to demonstrate our commitment to the welfare of laboratory animals not only in Australia but on the international stage". It wasn't just a matter of accreditation for us but rather a commitment to high levels of animal care, husbandry and welfare. "Of course this is only the beginning and we are committed to maintaining our accredited status and to also engage in constant improvement and refinement of all we do and consistent with the welfare paradigm in which we work," he said.

More than 900 institutions in 39 countries have successfully chosen to go down the demanding accreditation route, seeing value in in a process that enables them to benchmark their animal care and use on a global scale. Using each country's own local and national regulations and policies, as well as the overarching principles of the *Guide for the Care and Use of Laboratory Animals* (*Guide*)[1] and, where appropriate, the *Guide for the Care and Use of Agricultural Animals in Research and Teaching*[2] as their assessment standards, AAALAC's expert consultants evaluate the entire animal care and use programme.

Global Director for AAALAC, Dr Kathryn Bayne says, "Science is increasingly a global enterprise, as illustrated by the number and scope of international research collaborations and scientific meetings, as well as the number of journals publishing articles from the international scientific community".

"Bridging these international interactions is a clear scientific imperative for reproducibility of results and statistical validity of data. And, one possible source of scientific variation is related to the quality of care provided to experimental animals and the animals' welfare status. So it is critical to ensure a high level of animal care and welfare is maintained by research institutions world-wide".

Later in 2014, a second Australian institution – VetX Research based in Casino, New South Wales – was also successful in achieving AAALAC accreditation.

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1 National Academy of Sciences, (2011). *Guide for the care and use of laboratory animals (8th edition).* The National Academies Press, Washington.

2 Federation of Animal Science Societies, (2010). *Guide for the Care and Use of Agricultural Animals in Research and Teaching (3rd edition).* Federation of Animal Science Societies, Illinois.

Shadowing an Animal Welfare Inspector for a day

My name is Ainhoa Pardo Elordi, a Spanish national who has been working for 3 months at the Ministry for Primary Industries with the Animal Welfare team seconded from the European Commission.

During my time in New Zealand I had an opportunity to get some first-hand working experience. Those experiences have been one of the best parts of my secondment as I have had the chance to learn how the New Zealand animal welfare system works.

I have done a lot of things, like spending one day working on a dairy farm, learning to do body condition scoring, visiting a slaughter plant and participating in the organisation of a roadshow on Animal Welfare Fitness for Transport. In this article I discuss the day I spent working with one of the MPI Animal Welfare Inspectors in the Canterbury region.

MPI Inspectors respond to the complaints about poor animal welfare situations they receive. These complaints can be made by members of the public ringing the MPI 0800 phone number, or by other parts of MPI (e.g. Verification Services) referring an issue. All complaints are investigated and Inspectors take action depending on the specifics of the situation.

I spent a day in the Canterbury region working alongside a MPI Animal Welfare Inspector. We visited a dairy farm and a beef cattle farm. Investigations were orientated in two ways – alleviating compromised welfare and investigating a breach of the Act.

The first priority is to mitigate any pain and distress detected in any animal. This will often involve the Animal Welfare Inspector engaging a veterinarian to provide treatment or to make a recommendation in regard to euthanasia. In some instances the Animal Welfare Inspector will make an order pursuant to the Animal Welfare Act that the farmer must engage their veterinarian to provide treatment. The Animal Welfare Inspector will consider what has caused the animal welfare issue. He will then put steps in place by providing education and advice so the issue does not recur.

The second priority is for the Animal Welfare Inspector to gather evidence that proves there has been a breach of the Animal Welfare Act. This often involves interviewing everyone on the farm and having veterinarians conduct post-mortems on animals. After the evidence has been obtained a decision is made as to the appropriate sanction (e.g. a warning or a prosecution). At our first farm visit there were a large number of cows with severe lameness. The lameness appeared to have been caused by the farm having closed down one of its two milking sheds. This caused the cows to have to walk an excessive distance to be milked. When the farmer became aware he had lame cows he failed to seek treatment for the cows or put steps in place to manage the lameness. In some instances, the lameness was so severe it was beyond treatment and several cows were required to be euthanised. The purpose of our visit was to ensure the lameness was being managed appropriately.

On the second farm we visited the situation was a bit more complicated. The farmer had previously been convicted for underfeeding dairy cattle and was now underfeeding beef cattle. The Animal Welfare Act, and the Sheep and Beef Cattle Code of Welfare, requires that animals are adequately fed. The purpose of this visit was to serve legal documents on the farmer that he was to be prosecuted again.

From my perspective it was remarkable the kind of relationship that the Inspector was able to establish with the different farmers. Even if the situation was serious and with a high likelihood of legal action, the Inspector's advice, tools and recommendations were well received by the farmers who seemed to respect them.

Ainhoa Pardo Elordi

Codes of welfare – update on consultation, development and review since *Welfare Pulse issue 17*

Codes of welfare are issued by the Minister for Primary Industries under the Animal Welfare Act 1999. Codes outline minimum standards for the care and handling of animals and establish best practices to encourage high standards of animal care.

Issued

- Humane Destruction of Dairy Cattle On-Farm Amendment **http://www.biosecurity.govt.nz/animal-welfare/codes/dairy-cattle**
- Rodeos **http://www.biosecurity.govt.nz/regs/animal-welfare/req/codes/rodeos**

Recommended to the Minister

- Horses and Donkeys

In post-consultation process

- Dairy Housing Amendment
- Temporary Housing of Companion Animals

Under development

- Saleyards
- Animals in Public Display, Exhibition and Entertainment

A complete list of the codes of welfare can be found on our **website**.

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Across our desks

A selection of interesting items from journals which have crossed our desks.

Pre-feeding behaviour in horses

The modern stabled horse is fed restricted amounts of forage and discrete high energy cereal based meals, which strongly contrasts to the 16–18 hours that horses living in the wild spend grazing each day. This study used a survey to examined feeding practices used for horses in the UK and found that pre-feeding behaviour such as aggression, frustration or stereotypical behaviour was found in a large number of horses. This suggests that the welfare of horses may be improved by adopting a management system more suited to a horse's physiological and behavioural needs.

Hockenhull J and Creighton E (2014). *Animal Welfare* 23, 297-308.

Predictors of adoption of shelter dogs

The behaviours that shelter dogs exhibited during interactions with a potential adopter and the intention of the adopter on the day of their visit to the shelter were examined. It was found that most adopters only interacted with one dog, for an average of 8 minutes, and dogs were more likely to be adopted if they played with and lay in close proximity to the visitor. The adopter's intention to adopt a dog prior to the interaction was the highest predictor of adoption suggesting that visitors that intended to adopt a specific dog, but then chose not to, may be amenable to programmes to encourage them to adopt other dogs.

Protopopova A and Wynne CDL (2014). *Applied Animal Behaviour Science* 157, 109-116.

Consumer and societal requirements for sheep meat production

The sheep meat industries in Australasia are required to produce meat that will match consumer's expectations for quality and animal welfare, as well as ethical and environmental dimensions of the production system. Non-consumers also place pressure on farmers to increase the welfare of their stock. This paper examines the 'at risk' practices associated with sheep farming in Australasia and how the industry may need to move over the next decade to meet changes and maintain consumer trust in these industries.

Ferguson DM et al (2014). *Meat Science* 98, 477-483.

Provision of large or small amounts of straw on piglet injury and growth

Straw was provided either in a single large (15–20kgs) amount or in daily small (0.5–1 kg) amounts to sows kept in a loose housing system prior to them farrowing. It was found that there were a lower number of injuries to the piglets that were born and raised with the larger amount of straw. The piglets also showed a larger weight gain over the first five days of life and higher body weight at weaning, indicating that the provision of large amounts of straw has a positive influence on the welfare of piglets, as well as the sow, by giving her the opportunity to perform nest building behaviour.

Westin R et al (2014). *Preventative Veterinary Medicine* 115, 181-190.

Mouse aversion to isoflurane and carbon dioxide

The aversion of mice to three different methods of euthanasia was tested: a chamber with gradual fill CO_2, or isoflurane administered by a dropper or by a vaporiser. It was found that isoflurane concentrations rose more quickly in a chamber using the dropper, and mice were less averse to isoflurane using a vaporiser a dropper, or the use of CO_2. This suggests that mouse euthanasia using a vaporiser is the most humane method of euthanasia out of the three techniques. However, as mice were more averse to being exposed to isoflurane for a second time, re-exposure of mice to isoflurane should be avoided.

Moody CM and Weary DM (2014). *Applied Animal Behaviour Science* 158, 95-101.

Your feedback

We look forward to hearing your views on *Welfare Pulse* and welcome your comment on what you would like to see more of, less of, or something new that we have yet to cover.

Please send your feedback to us by emailing **animalwelfare@mpi.govt.nz**

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Welfare Pulse

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The articles in this magazine do not necessarily reflect Government policy. For enquiries about specific articles, refer to the contact listed at the end of each article.

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