

Introduction

Members of the veterinary profession are considered and expected to be authorities on animal care and well-being. It is therefore essential that we all understand the reasons why we, as humans, interact with animals the way we do. This white paper, which was first published by the World Veterinary Association several years ago, has been reviewed and is designed to convey important information on this complex issue. It should form the basis for further discussion within the profession. The major focus on the western nations of North America and Europe needs to be expanded to include a perspective on animal care and use in developing countries.

Urbanization of nations throughout the world has resulted in a situation where many people do not know of the historical interactions between animals and man. Do not have an understanding of domestic animal care systems or even an appreciation for the relationship wild (non-domesticated) animals have with other organisms in their ecosystems. As people relocated from rural environments to urban environments, many did take their animals with them - albeit in the form of companion animals.

Companion animals, rare 50 years ago, now account for a large segment of the total domestic animal population (e.g. 110 million cats and dogs in USA) and a majority of members of the veterinary profession. These animals through social interaction share our homes, and provide us with comfort, pleasure and companionship. Often pets have become surrogates for children and deceased spouses, especially among the elderly. It is no wonder that most Western families look upon them as "family members", afford them many of the same luxuries as human family members and even think of them in anthropomorphic terms. When companion animals are afforded certain "rights" in our household it is not difficult to understand why society wants to extend those rights to other animals such as primates, cetaceans, or even production and wild animals.

Agriculture

Agricultural practices in Western nations have changed dramatically over the past 50 years. These modified practices are now being rapidly adopted in developing nations and changing them from family subsistence agriculture to intensive animal production systems. In many instances this profoundly impacts on the care and welfare provided to livestock and poultry. In most developed countries, animals are no longer used for work purposes. However they continue to play a significant role in

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transport and draught in a number of developing countries. This situation too is changing as the infrastructure necessary to maintain mechanized transport is created.

The combined effects of urbanization and advances in agricultural practices have created great concerns by some that animals to an extent have been overlooked during this period of "modernization". In fact, most people in urban communities today have little knowledge or appreciation of how the food they eat gets from the farm to their dining tables. They have little or no historical recollection of how animal production agriculture existed 60-70 years ago: the high mortality associated with infectious disease, environmental changes and predation. Today there is a lack of understanding on how intensive animal production systems came into being or the rationale for establishing certain types of housing, i.e. battery cages for laying hens, or veal crates for calves. This does not mean that every advance in animal production has failed to take farm animal welfare concerns into account.

Intensive animal production practices and technology have continued to progress. Pens and housing enclosures originally were designed to control parasites and infectious diseases which are now controlled by therapeutics and vaccinations. As we become more knowledgeable of the behaviour and social requirements of animals, we must promote changes in husbandry methods which seek to accommodate those needs. Very significant changes in husbandry practices are now demanded by society and regulated in some countries. Switzerland has effectively prohibited battery caging since 1992 under The Swiss Animal Protection Act. Sweden placed a ban on battery caging in January 1999. Swedish farmers are still uncertain on the wisdom of this decision as it becomes more difficult to produce eggs in a cost effective way. In June 1999 political agreement was reached to phase out the battery cage system by 2012^[Comment1]

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Another major factor influencing change in production agriculture is personal commitment. It is not enough to ban a practice if a country simply exports the problem to another country. Personal commitment must involve bearing the high costs associated with these changes. Trends towards urbanization are extending world wide and as the veterinary profession must take note of the changing attitudes of society.

Society's involvement with animals is being re-evaluated at many levels: agriculture, entertainment, sport, companion and conservation. In many of these areas the veterinarian could

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play a significant role. Society looks to our profession for sound guidance.

According to Rollin : “ Mainstream society does not say we should not use animals or animal products. It does say that the animals we use should live happy lives where this can meet the fundamental set of needs dictated by their natures and where they do not suffer at our hands”.

“Society, in general, while still wanting animal products, wants the assurance that animals live happy lives under conditions that suit their natures”

“If modern agriculture can no longer guarantee the respect for animals’ natures presupposed in traditional agriculture, laws and regulations may become necessary.”

The veterinary profession’s role should be to strive, through research, education, practice and leadership, to provide that assurance.

The veterinary profession must contribute actively in the preparation of animal welfare standards for use, not only in the developed nations, but also for use in developing nations. These standards must recognize the needs of the societies involved, but also the constraints to making advances and the limitations of animal rights in animal production. The World Veterinary Association should lead in the development of global welfare standards and the sharing of existing standards between nations so that they may be used as a basis for local standard development.

Animal Welfare and Animal Protection Legislation

Animal Welfare Organizations have, since the 19th century, been interested in preventing neglect, cruelty and abuse to animals. In many instances these organizations, often with co-operation from the veterinary community, have sought and secured local, regional and/or national legislation to protect animals from harm. Society's concern for the protection of animals has a long history with the first protective legislation in the Western world being written into the “Body of Liberties” by the Massachusetts Bay Colony in 1644. National Protective Legislation was enacted in the United Kingdom in 1822. Animal anti-cruelty legislation preceded child abuse legislation in the USA and, in fact, the first case of child abuse was prosecuted using Michigan State's animal anti-cruelty code. Initially the anti-cruelty codes concentrated on prevention of abuse to animals but over the past century States in the USA and other countries’ governments have expanded the original scope of their animal anti-cruelty legislation to include requirements for humane care.

Concerns for the proper care of animals extend across agriculture to many non-agricultural arenas. Animal welfare legislation continues to be refined in some countries and provides models

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for the development of new legislation in other countries The World Veterinary Association has been pro-active in the sharing of this legislative information. As well as general animal welfare legislation, some countries have implemented legislation to protect specific classes of animals. Research animals have required special provisions especially to ensure that the source and use of these animals is appropriate. National legislation specifically addressing the needs of animals used in research was first implemented in the UK in 1876 under The Cruelty to Animals Act and significantly revised in 1986. The Animal Welfare Act, protecting animals in research and exhibition was first passed in the USA in 1966 and has since been amended five times.

A second national act to protect research animals was introduced by the USA Congress in 1985. This act required the establishment of committees to renew and approve or deny proposed research based on animal welfare concerns. This provides the oversight of animal use and animal well-being independent of the investigator. Each committee must contain a scientist, a non-scientist, a veterinarian and a non-affiliated member to represent the community. Animal care committees have been required in Canada since 1968 under the Canadian Council on Animal Care voluntary peer assessment program. The United Kingdom has in April 1999, mandated a system of ethical review for all animal research proposals. Research animal protection legislation covers animals used throughout North America, Europe, Australia, New Zealand, Japan and parts of Asia and Africa. Special protective legislation has been drafted in many countries to cover species that are treated or endangered or migratory.

The last animal welfare legislative development before the new millennium is likely to be that to be enacted in New Zealand. The focus of this new legislation is the requirement for owners and managers of animals to exercise a duty of care to manage ^[Comment3]

animal welfare within the parameters defined in Codes of Welfare that are developed via a system which requires full consultation with stakeholders and provides an opportunity for general public input.

Every member of the veterinary profession around the World has a duty to meet the societal expectation that veterinarians will help set and manage standards of animal welfare. The World Veterinary Association, through its Animal Health and Welfare Committee, will continue to encourage the development of animal welfare standards and facilitate the sharing of standards and legislation.

Advancement of Knowledge in Biomedical Sciences

Biomedical research involving animals has a number of objectives including:

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- obtaining basic biological knowledge per se,
- providing biological knowledge upon which disease prevention and treatment may be based,
- providing models for the study of naturally occurring diseases of humans and animals,
- testing of potential therapies, diagnostic and surgical procedures and medical devices,
- studying the safety and efficacy of new drugs or to determine the potential toxicity of chemicals to which humans and animals are exposed,
- humane management of the animals involved,
- independent approval and supervision of biomedical research involving animal use.

Investigators must first understand the basic physiological principles operative in each system of interest before major advances in treatment and prevention of disease can occur. Animal models can act as surrogates for humans in evaluating the safety and efficacy of a new drug during the pre-clinical stage of development. Various pharmacokinetic and pharmacodynamic studies are conducted using animals and in-vitro systems to provide this assurance. The Nuremberg Code of Medicine Ethics, which was signed by 71 countries worldwide in 1956, specifically forbids the exposure of humans to drugs or medical devices before **their** safety has first been demonstrated in animals. The shift in societal values since then may require a rethink of this mandatory use of animal models. The veterinary profession should lead the way in the development of new standards because of its expertise and balanced view of animal welfare standards.

In response to criticism by animal protection organizations that animal research is unproductive the U.S. Surgeon General C. Everett Koop wrote :

"there have been many distortions presented to the public on the use of animals in research, including the premise that the same research could be done without animals. That simply is not true.

Many believe that research is cruel and that animal subjects suffer unnecessary pain and distress. However the rules which currently govern animal experimentation are among the most extensive and rigorous for any discipline. There are national or regional laws, rules or enforced guidelines in all developed countries. These can provide models for similar controls to be used where animal research is used in developing countries. There have been many instances, especially in the United States and Western Europe, where animal rights activists have taken extreme actions against research facilities and other users of animals including butchers. Their anthropomorphic campaign to give animals the right to a life in circumstances equivalent to

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those enjoyed by humans is regarded as extreme by mainstream society, but the increasing urbanization of society has meant that their views are gaining wider acceptance. The veterinary profession has an important role to ensure that society receives a balanced view of the care and use of animals by man.

Veterinarians are important participants in animal research. They evaluate studies, guarantee animal well-being, provide advice to investigators concerning animal procedures and developing pain management programs.

Prior to commencing a research project involving animals, scientists must have their qualifications evaluated. All must be trained in humane experimental technique and employ the Russell and Burch "Three Rs" principles of replacement (non-animal techniques for animals), reduction (reducing the numbers of animals used) and refinement (application of techniques to reduce and eliminate pain and suffering).

In June 1992, more than 100 American professional and voluntary health organizations signed a statement of support for animal research.

They said :

"We wish to reaffirm our support for the continued humane use of animals in biomedical and behavioural research, testing and education. We reject the characterization of animal research as unnecessary, for we have seen life-saving and live-enhancing benefits of such research."

The number of animals used in research has been reduced significantly over the last 30 years in the United States and the United Kingdom. The vast majority of animals used in research are purpose-bred. Many now live for a full lifetime in a quality environment that provides for their physiological and behavioural needs. Of the numbers reported, non-human primates make up 0.5% of research animals, cats and dogs only 1% and most research animals are rodents, fish and rabbits (90%).

Biomedical research involving animals has been in part responsible for the discovery of vaccines against polio, diphtheria, mumps. Measles, rubella and smallpox; broad-spectrum antibiotics; anaesthetics and analgesics; blood transfusions; intravenous feeding; cardiac pacemakers; radiation and chemotherapy for cancer; diagnostic techniques such as ECG, EEG, angiogram, cardiac catheterization and endoscopy; open heart surgery for coronary bypass, valve replacement and correction of

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congenital defects; surgical treatment for blocked and damaged arteries; insulin for diabetes; medications for asthma and other respiratory diseases, control of epileptic seizures, arthritis, colitis, gastric ulcers; organ transplantation and drugs to prevent rejection; kidney dialysis; artificial joints; treatment of Rh factor disease and phenylketonuria (pku); medications to treat mental illness; cataract removal; lens implants; treatment of hypertension; micro-surgery of limbs; rehabilitation of stroke and accident victims and much more.

The principle, that animal experimentation can predict the action of drugs in man is not only the basis for using animals as models but also results in animals often being the beneficiary of drugs and devices designed for humans, e.g. hypodermic syringes, hip replacement, disc surgery, insulin, chemotherapy, sutures and grafting, intravenous fluid therapy, etc.

A segment of animal research is directed to the benefit of animals. All animal vaccines including rabies, distemper, parvovirus, hepatitis, anthrax and tetanus, as well as the treatments for parasites, orthopaedic surgery, prevention of feline leukemia, therapy for cancer, detection of tuberculosis and brucellosis in cattle, hog cholera, canine heartworm, and improved nutrition for pet animals have been developed through animal studies.

Today the task seems greater than ever. Alzheimer's Disease, the leading cause of hospitalization among the elderly, is being investigated using animal models, as are HIV vaccines and vaccines for malaria, schistosomiasis, leishmaniasis and trypanosomiasis (the latter four afflicting an estimated 800 million people worldwide) .

Dr. James Wyngaarden, former Director of the National Institute of Health (USA) has stated : "on average, Americans will live 20.8 years longer today due to medical advances that depended on animal research"

As we approach the 21st century scientific advances in gene therapy, transgenesis, drug delivery systems and xenotransplantation are leading issues in biotechnology. The future development and utilization of new technologies using animal models will result in an increased awareness of animal welfare issues. Veterinarians must provide leadership in assurance that policies and initiatives will be taken to address these concerns.

Safety In the Environment

The second half of the 20th Century has seen the awakening of

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society to the changes in the environment that have resulted from human habitation of our planet. The concerns of environmental degradation are certain to increase in the new millennium. A major focus will be the contribution of animal husbandry to global pollution. Examples are the emission of large volumes of methane by ruminants and the disposal of animal excrement from intensive production facilities. The challenge for the veterinary profession will be the contribution that veterinarians can make in the continuing increase in food production required to meet the demands of the growing world human population without further degradation of the environment

Poisons are chemical substances that are harmful or "toxic" to living things. When ingested in sufficient quantities, all substances, whether natural or man-made, are poisonous. Tests to evaluate the toxicity of a chemical may involve a limited (acute toxicity) or prolonged exposure (chronic toxicity) by any of the routes humans or animals are likely to be exposed, e.g. oral, dermal, inhalation, or ocular. We usually think of toxicities as resulting from single chance encounters with a chemical; however, we are exposed to many chemicals on a daily basis, e.g. soaps, shampoos, toothpaste, perfumes, aspirin. Fetuses may be particularly vulnerable to certain chemicals to which they may be indirectly exposed while in the womb. Thus a variety of specific endpoints are evaluated such as cytotoxicity; mutagenicity, carcinogenicity and teratogenicity.

In 1962, Rachel Carson awakened the world to the toxicity of DDT, a chemical with great bio-accumulation potential which nearly drove falcons and other raptors to extinction. DDT was used as an insecticide and sprayed over millions of square miles as a control for mosquitos in malaria eradication programs of the 1950s. Nobody predicted the levels or toxicities manifested in animals at the top of the food chain. This and similar incidents led to the development in the United States of the Environmental Protection Agency (EPA) in 1970. and the Toxic Substances Control Act of 1976. The Act requires the EPA to test all potentially harmful chemical substances already available. There have been similar legal developments in many other countries to manage the risks to the environment and its inhabitants.

Internationally, legislation has been created for the sole purpose of regulating safety in the workplace. There have been many incidents involving human toxic chemical exposures occurring at work. In Japan workers assembling watches with radium-painted dials ingested toxic levels of this radioactive substance, leading to cancer and death. In the United States workers in a West Virginia plant were exposed to dioxin and suffered skin irritation, headache and respiratory difficulty. Later, animal testing demonstrated that dioxin is a carcinogen, teratogen and causes severe damage to the liver and immune systems. The Occupational Safety and Health Administration requires that animals are an essential part of the safety testing program in the United States.

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Consumer Product Safety legislation is designed to ensure that products for sale be appropriately labelled if toxic. Many labelling claims are validated by animal testing. Suppliers of consumer goods such as cosmetics, toiletries, pharmaceuticals must test their products to ensure safety. The results of animal testing also provides critical information to poison control centres to be used during emergency exposure. This information serves as the basis for formulating treatments used in emergency rooms following accidental exposure. Pharmaceutical companies use animal studies to determine the drug doses which are efficacious but non-toxic or having minimal adverse effects.

Many individuals criticize the use of animals in product testing but still insist on safe products. They point to many companies advertising "cruelty free" products -where reputedly no animals were used to test the formulation. However it has been reported that no product is available in the USA where chemicals together or individually have not been tested in animals at some point in time. Many individuals point to advances in computer imaging and in-vitro technologies and insist that these "alternatives" can replace animal testing.

The current situation is that non-animal tests are used at many stages of drug development and safety testing. No in-vitro technology(ies) can simulate the complexity of the multiple organ systems of an entire organism. For this reason it is inappropriate to refer to these in-vitro technologies as "alternative" but rather as adjuncts which, when used properly, reduce the number of products which are potentially unsafe and minimize the number which require animal testing. In 1993 both the United States Food and Drug Agency and Public Health Services made public statements :

"Many procedures intended to replace animal tests are still in venous stages of development.... while the best means may begin with valuable adjunct tests, ultimately testing must progress to a whole intact living system.. an animal.."

Alternative techniques have made a profound impact on the numbers of animals needed for product safety testing. While the FDA has maintained that "the Draize (rabbit eye) test is currently the most meaningful and reliable method for evaluating the hazard of safety of a substance introduced into or around the eyes", reduction of products proven "toxic" in in-vitro tests has resulted in an 87% reduction in rabbits used by the cosmetics industry between 1980-1989. Centres devoted entirely to development of alternatives have been established at :

- Johns Hopkins University, Centre for Alternatives to Animal Testing (CAAT), Baltimore;
- Fund for Replacement of Animals in Medical Experiments (FRAME), London;

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- Centre for Documentation and Evaluation of Alternative Methods in Animal Experiments (ZEBET) Germany; and at the
- National Institute of Environmental Health Sciences.

The search and validation process takes place in universities and pharmaceutical companies world-wide. Tremendous achievements have occurred by employing invertebrates (sea urchin, horseshoe crab, fruit fly), chemical tests and computer simulation. Unfortunately validation of the alternatives is costly in time and money and must show correlation with animal studies. Several widely used alternatives, such as the Ames test for mutagens, detect substances as toxic which are non-toxic in animals and man.

It is for this reason that the Director of the Johns Hopkins Centre has stated : "Currently in-vitro tests alone simply are not yet adequate to prove safety and efficacy in all personal care products" ; "For the advancement of humans and animals an integrated approach of clinical, whole animals and in-vitro studies is currently the best way to advance science, develop new products and drugs, treat, cure and prevent disease"

In 1992, the European Parliament amended the Cosmetic Directive 76/768 to ban the marketing of cosmetics containing ingredients that have been tested on animals after 1998. This Directive was re-affirmed during 1999. The Council of Ministers also agreed to consider an extension if no validated alternatives existed by 1998. This legislation affects an enormous consumer population (320 million) and has far reaching implications for human safety and international trade. Europe, the United States and Japan have been negotiating international harmonization of standards for pre-clinical drug testing and with many conditions now fully accepted, these standards will greatly reduce the numbers of animals used by eliminating duplication in safety trials.

The public is developing an expectation of environmental safety. This has been partly due to the lack of professional and other scientific societies properly educating the public on risk assessment and partly due to the widespread publicity given of chemical disasters such as Bhopal, Exxon Valdez and Chernobyl. The veterinary profession must form strategic alliances with the major global non-Government organizations, government regulatory agencies, scientists and industry to properly advise the public on these issues.

The role of the veterinarian

Veterinarians are knowledgeable and supportive of many different animal-related activities. While the majority of our profession are concerned with providing preventive measures and treatment for animal disease, others are involved with education, species preservation, conservation, and public health. The latter field differs from all previous occupations in as much as the humans are the principal focus of attention. Public health includes control of zoonotic diseases, enforcement of sanitary codes,

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evaluating the safety of new consumer products and medical devices and the advancement of knowledge in the medical (and veterinary) sciences.

Veterinarians must respond with sensitivity and honesty concerning the role of animals in research and testing. With virtually all the major medical and veterinary advances that have occurred during the past century dependent on animal experimentation it has not been difficult to rationalize their continued use. However, society's perception of what happens in research is often influenced by the publication of inaccurate and misleading statements. Few understand the laws and rules which must be followed or the oversight for animal welfare concerns which must be demonstrated.

Veterinarians must remember that "ordinary people never doubt that animals can feel fear, pain, boredom, joy, loneliness, etc".

Veterinarians should kindle the fire of knowledge, promote advancement in the biomedical sciences, while protecting the well-being of our research subjects.

Wesley Robb, theologian and philosopher, once said, "Since humans are the only agents of morality on the earth, they have a moral obligation to treat animals humanely"

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