A white seabird, possibly a booby, is captured in flight against a bright blue sky with wispy clouds. The bird has a long, thin tail streamer extending behind it. Below the bird, a dense forest of green trees is visible. The overall scene is bright and clear.

Science in the service
of animal welfare

**Universities Federation for Animal Welfare
Annual Report 2004–2005**



UNIVERSITIES FEDERATION FOR ANIMAL WELFARE

Letter from the Chairman

I can do no better than to direct you to the report of the Chief Executive, in particular the first two paragraphs, in which he sums up very succinctly the challenges that need to be addressed in the future. Increasing population of the world and consequent greater requirement for food will undoubtedly result in pressure on maintaining good welfare of food-producing animals. In addition, with the increasing number of species kept as companion animals in the developed world, it is a challenge to develop knowledge of their needs for good welfare.



I would also like to draw to your attention the bullet points on the first page of the report and in particular the quotation from Sir Peter Medawar. This page clearly describes what UFAW is all about and the remaining pages of the report describe the activities and achievements during the past year. I found the Annual Report very interesting and revealing reading. I am sure you will agree with me that the activities and achievements of the past year are impressive, especially when one considers the limited resources available. The staff should be congratulated.

Peter M Biggs

Designed and produced by Elizabeth A Roberts

Cover photograph: White-tailed Tropic Bird (*Phaethon lepturus*) by Katherine L Parkes

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Chief Executive's Report



The human population exceeds 6 billion and is still growing very rapidly. For animals of our bodysize, we have biologically unprecedented rates of energy use and, inevitably, a huge impact on ecosystems from pole to pole. The total productivity of organic matter (food) in the world is dependent on the sunlight falling upon it and is not limitless. We are now, whether we like it or not, in competition with many other species for, amongst other things, food and space. To a large extent, we influence the apportionment of essential resources amongst the species we share the world with, including the tens of thousands that are widely believed to be sentient. The world is thus faced with the challenge of meeting the requirements of the still very rapidly growing human population, whilst protecting biodiversity and the welfare interests of other sentient species that we use or whose fates depend upon our actions.

This requires, amongst other things, that we make sound inferences and judgements about feelings in other animals: whether or not they have them (bearing in mind that the animal kingdom spans from sponges and placozoans, which have no nervous systems, to vertebrates); their quality (pleasant or unpleasant); and their intensity — so that, when our interests conflict with theirs, as they will continue inevitably to do, we can attempt to balance these interests wisely and kindly, and to take proper steps to prevent or minimise risks to welfare.

UFAW aims to continue to play a leading role in advancing animal welfare by (i) promoting the science aimed at providing better understanding of animals' needs, physical and mental, (ii) promoting high standards of animal care through disseminating information and facilitating discussion, and (iii) making sure that in all of our interactions with them, animals' welfare interests are properly considered and addressed.

This Annual Report provides examples of some of the UFAW team's activities in these contexts during the past year. Special thanks from us all to Mrs Samantha Griffin, who joined the staff 20 years ago, for her terrific contribution to the enterprise.

We are very grateful for the generosity and loyalty of the charity's supporters and welcome any others who wish to join and help UFAW in its work to develop the firm foundations for advances in animal welfare.

A handwritten signature in blue ink, appearing to read 'James K Kirkwood'. The signature is fluid and cursive, with a large initial 'J'.

James K Kirkwood



UFAW ANNUAL REPORT

The Universities Federation for Animal Welfare, founded in 1926, is an internationally recognised, independent, scientific and educational animal welfare charity concerned with promoting high standards of welfare for farm, companion, laboratory and captive wild animals, and for those animals with which we interact in the wild. It works to improve animals' lives by:

- Promoting and supporting developments in the science and technology that underpin advances in animal welfare
- Promoting education in animal care and welfare
- Providing information, organising meetings, and publishing books, videos, articles, technical reports and the journal *Animal Welfare*
- Providing expert advice to government departments and other bodies and helping to draft and amend laws and guidelines
- Enlisting the energies of animal keepers, scientists, veterinarians, lawyers and others who care about animals

“Improvements in the care of animals are not now likely to come of their own accord, merely by wishing them: there must be research ... and it is in sponsoring research of this kind, and making its results widely known, that UFAW performs one of its most valuable services.”

Sir Peter Medawar CBE FRS, 8 May 1957

Nobel Laureate (1960), Chairman of the UFAW Scientific Advisory Committee (1951–1962)

Recent UFAW activities

UFAW SAWI Fund: promoting animal welfare in Israel

The Director, James Kirkwood, travelled to Israel in February 2005 to discuss current animal welfare matters and to explore ways in which the UFAW SAWI Fund may be put to best use to help in the promotion of animal welfare. He met with the Deans and staff of the Koret School of Veterinary Medicine and of the Agriculture Department of the Hebrew University, with staff at Tel Aviv University, with staff responsible for animal welfare in the Ministries of the Environment and of Agriculture, with the past president of NOAH, the umbrella organisation for animal welfare associations in Israel, and with many others. It was a very useful visit and James is very grateful to all those he met for their kind hospitality and for the advice and information they provided.

Among the ideas discussed was the promotion of animal welfare at universities and colleges. The scientific approach to animal welfare – to determining animals' needs and how these needs can be met in practice – has been very fruitful. UFAW has helped to stimulate and foster this. The development of animal welfare science as an academic discipline (or group of disciplines) in the UK has been very beneficial for animal welfare, both by leading to direct improvements in the way animals are cared for and by helping to stimulate further public interest in the subject and raising the level of debate about animal use and care. Might there be ways in which the UFAW SAWI Fund could be used to help develop animal welfare science in Israel? This idea was widely discussed and a trickle of proposals for relevant pilot projects has begun. We are looking for acorns that may grow into great oaks, or rather, for olives that may grow into great olive trees.

2005 Wild Animal Welfare Award

Congratulations to Paignton Zoo, winner of the 2005 Wild Animal Welfare Award. This award, which will be presented in October, has been given in recognition of the way Paignton has incorporated positive reinforcement training (encouragement of the performance of desired behaviour patterns through the giving of rewards) into their primate husbandry and management routines. The implementation of training regimes in zoos is surrounded by controversy, with some expressing concern about the possible impact on the conserving of 'natural' patterns of behaviour. Paignton's approach, which is based upon careful consideration of the likely costs and benefits to the animal, and which sets clear goals, is, in the judges' view, a model of how such schemes should be implemented. The award particularly acknowledges the use of this approach to training in the assessment and monitoring of the dental and physical health of a socially housed group of Abyssinian colobus monkeys. The team at Paignton, led by Dr Vicky Melfi (1997 UFAW Vacation Scholar), has used the opportunities presented by the training regimes to collect data. This has allowed them to assess the impact of such regimes on natural behaviour and to address common concerns of zoo professionals. Paignton intends to use the £1000 prize to support a programme of workshops aimed at teaching other zoo professionals to implement similar training schemes.



Garden Bird Health Initiative

Two of the main aims of the Garden Bird Health Initiative (GBHi), which was formed from a Working Group established by UFAW in 2003, were brought to fruition during the year. The GBHi set out to publish science-based best practice guidelines on feeding garden birds and to promote research into the supplementary feeding of garden birds for their welfare and conservation.

The Working Group includes representatives from the Institute of Zoology, the British Trust for Ornithology, the Royal Society for the Protection of Birds, Liverpool University, The Scottish Agricultural College, CJ WildBird Foods Limited, Gardman Limited, Cranswick Pet Products, Jacobi Jayne & Co, and Defra. The first product of this initiative, the booklet *Feeding Garden Birds: Best Practice Guidelines*, was published in March, as was a free leaflet summarising the key principles. These publications are available from UFAW. The project has received some press coverage and there has been considerable interest in the booklet.

Ben Bradshaw, Minister for Animal Welfare and Nature Conservation, said in a press release about the initiative: "Garden birds enrich our lives and, since we share and frequently control their habitats and can greatly influence their lives, we need a better understanding of their biology and needs. I am delighted that these leading veterinary, ornithological and bird care organisations are working together on this initiative and I wish it every success."

The Group has raised over £240,000 towards its target of £360,000 for the three-year research project to investigate key factors that can affect garden bird health. As a result it has been possible to begin the project. It involves a consortium of vets and scientists across the country and is being coordinated by Dr Andrew Cunningham and Becki Lawson at the Institute of Zoology. The research project has received support from CJ

WildBird Foods Limited, Gardman Limited, Cranswick Pet Products, the Birdcare Standards Association, the Institute of Zoology, RSPB and the British Veterinary Association Animal Welfare Foundation, to all of whom we are very grateful. The project has also been supported by UFAW, and we are seeking further funds towards the £360,000 target needed to cover the costs of the full research project into causes and prevention of common diseases of garden birds.





RESEARCH

The welfare of animals under human care depends upon:

- 1) belief in the sentience of the animals;
- 2) understanding that this is a morally important matter;
- 3) having proper knowledge of the animals' needs;
- 4) having the ability and resources to meet these needs; and,
- 5) applying these beliefs, abilities and resources conscientiously.

UFAW's efforts are focussed largely at the third of these points — improving knowledge of animals' needs. It is now accepted widely, although it was not always so, that a broad range of species of animals are sentient — that is, that they have the capacity to experience unpleasant and pleasant feelings — and that it is important that this is taken into account in our interactions with them. The bottleneck in promoting good animal welfare is now very frequently at the third step — a lack of proper understanding of animals' needs and of how these can be recognised. For many species, including some companion and farm animals, knowledge of environmental and psychological needs remains less complete than is often assumed, and a great deal of both fundamental and applied research remains to be done in these areas.

UFAW supports animal welfare research through its Research Training Scholarships, its Research Fellowships, its project award schemes and the Vacation Scholarship scheme (the main purpose of the latter is educational). News of a few UFAW-funded projects are outlined here to exemplify the Federation's current research interests.

Pharmaceutical Housing and Husbandry Steering Committee

The Pharmaceutical Housing and Husbandry Steering Committee was established by UFAW in order to fund animal welfare research within the pharmaceutical production and testing industry. Verity Bowell (University of Stirling), supervised by Dr Hannah Buchanan-Smith, is now in the second year of her PhD researching 'Practicalities and possibilities of using positive reinforcement training for primates in laboratories'. This research is important as, although there is increasing awareness of the welfare benefits of using positive reinforcement training (PRT) to encourage laboratory-housed primates to cooperate with husbandry and scientific procedures, there is still little information on the practicalities of implementing the techniques. Verity's research has shown that marmosets can be trained to enter a transport box in, on average, 8 min per pair. They can also be trained to come to a particular area of the cage, so that their identity chips can be scanned and they can be captured by hand. The research has also shown the practical limitations of the technique for more aversive experiences. Verity is currently studying the behavioural and physiological responses of marmosets and macaques to training. She has presented papers at the International Primatological Society

Congress 2004, the European Marmoset Research Group meeting 2004, the Primate Society of Great Britain meeting 2005 and the Laboratory Animal Scientists Association welfare meeting 2005. An abstract has also been accepted for presentation at the International Society for Applied Ethology Congress 2005. UFAW's Deputy Director, Dr Robert Hubrecht, also presented a paper on ways in which marmosets' welfare may be compromised by laboratory housing at the International Primatological Society Congress 2004, based on his studies of the behaviour of these fascinating animals in their natural habitat and in the laboratory.

Kerry Westwood (University of Bristol), supervised by Dr Mike Mendl, is now in the final year of her studies. Her work on the effects of cage size, space allowance, environmental enrichment and their interactions on behaviour, stress, immune function and welfare of laboratory mice has progressed well. UFAW is delighted to report that the PHHSC has raised sufficient funds from its members to fund a further project, its fourth, in the coming year.

Understanding cognitive components of emotion

Emotions can be regarded as multifaceted adaptive states or processes, comprising physiological, behavioural, cognitive and subjective (consciously experienced) elements. Direct measurement of conscious experience of emotion in non-human animals is not possible. Because of the lack of self-report in such species, researchers have traditionally relied on measuring the other components (eg behavioural and physiological), inferring results based on corresponding linguistic reports in humans. However, disparities can occur between these measures and subjective reports. Dr Elizabeth Paul and her colleagues at Bristol University received support from UFAW to investigate whether an objectively measurable component of emotion is dissociable from the self-reported, subjective component. The first part of their research involved developing a computer-based task for measuring the non-linguistic, cognitive component of emotional states in humans. The second part, which is ongoing, is concerned with the identification of naturally occurring variation between individuals in the subjective component of emotion and the experimental induction of such variation. Upon completion, they hope to bring together the cognitive task developed in Part 1 with the methods developed for identifying and generating variation in subjective emotion in Part 2 in order to investigate whether variation in the subjective experience of emotional states is linked to the cognitive component of emotion, as measured by performance on the cognitive task. A review of this subject has already been published (Paul *et al* 2005), and further papers are in preparation. We are pleased to hear that Dr Paul and her colleagues have received further funding from the BBSRC to continue with their research.

Effect of visitors on breeding seabirds

In 2001, Colin Beale (University of Glasgow) began to study the effects of ecotourists and researchers on the physiological and behavioural responses of seabirds. This work, which formed part of Colin's PhD thesis under the supervision of Professor Pat Monaghan, focussed on kittiwakes (*Rissa tridactyla*), a species which is known to display little behavioural response to, and is assumed not to be particularly disturbed by, human presence. With the aid of a UFAW grant, researchers developed a new method for concealing heart rate recorders in nests in order to obtain accurate data without stressing the birds. Using this new technique, they found considerable variation in heart rate response to researcher presence, with some birds experiencing a 14% higher heart rate than when at rest, and others displaying no change. They also found that when observers were close to the nests, most birds showed a small increase in the proportion of time spent awake. They found no evidence that birds became habituated to disturbance either during the time a visitor was present or over the course of several visits. An increase in heart rate is likely to be associated with increased energy expenditure and/or higher levels of circulating stress hormones. As a result of this increase in metabolic costs and the subsequent decline in body reserves, there is an increased likelihood of nest desertion when the birds run out of resources.

Research Training Scholarship, Naomi Latham 2000–2004

'Refining the role of stereotypic behaviour in the assessment of welfare: stress, general motor persistence and early environment in the development of abnormal behaviours.'

Stereotypies – repetitive, unvarying and apparently functionless patterns of behaviour – are commonly regarded as one sign of poor welfare. Their relationship with other welfare measures, such as raised levels of urinary corticosterone, is, however, far from clear-cut. Naomi Latham (University of Oxford), supervised by Dr Georgia Mason, sought to determine whether the complexity of this relationship may arise, in part, from differences in the underlying causes of stereotypy development and performance. For example, some stereotypies may stem from frustrated attempts to perform motivated behaviours (and may, therefore, track other welfare measures reliably); others may substitute for motivated behaviours or be rewarding through their repetition (and may, therefore, appear beneficial for welfare); while others may stem from habit-formation processes or central nervous system changes that result in behavioural persistence (and may, therefore, appear neutral to welfare).

In order to manipulate the expression of stereotypy, Naomi reared laboratory mice in different conditions (eg standard laboratory conditions; delayed, naturalistic weaning; and enriched cages) and assessed physiological and behavioural signs of stress and frustration in these animals, and their general behavioural persistence. She found that mice did indeed show signs of behavioural persistence and frustration, and the mice that exhibited the highest stress responses to environmental disturbance and/or change were most likely to be high stereotypers later in life. These were also the mice that were the least likely to reduce their stereotypy following enrichment. Naomi also found that enrichment had an important role to play in improving mouse welfare. Mice housed in an enriched environment as young animals developed less stereotypic behaviour than those housed

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in standard cages, and the provision of enrichments to adult standard-housed mice also seemed to reduce stereotypy. To gain access to an enriched cage, some mice were willing to push open a door weighing over 3½ times their own body weight, and they would push a total weight equivalent to almost 30 times their body weight over the course of a day. Naomi's findings are an important contribution to our understanding of improved conditions for laboratory mice.



EDUCATION

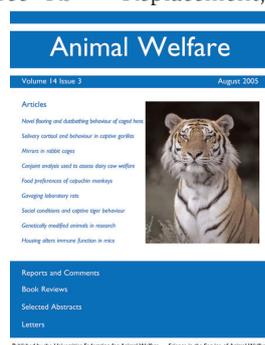
Lack of information about, and poor understanding of, animals' requirements, and lack of skill and experience in detecting pain and other aspects of poor welfare, are at the root of many animal welfare problems. A great deal can be done to overcome these difficulties through education. UFAW does not have the resources for running large-scale education programmes and, in view of this, targets its efforts at the tertiary education level — universities and colleges — to help teach those who will become the teachers in the future. UFAW promotes animal welfare education in a variety of ways, including:

- 1) Publication of the journal *Animal Welfare*;
- 2) Publication of key texts on animal welfare (eg *The UFAW Handbook on the Care and Management of Laboratory Animals*, and the UFAW/Blackwell Animal Welfare Series);
- 3) Running workshops and symposia;
- 4) Lecturing at universities and colleges;
- 5) Running the Vacation Scholarship scheme, to enable students to develop their interest in animal welfare science;
- 6) Running the Research Training Scholarship scheme, to provide training in animal welfare research;
- 7) Providing financial support for other educational initiatives.

Some examples of the educational work undertaken or supported by UFAW are outlined here.

The UFAW journal *Animal Welfare*

Animal Welfare is now in its fourteenth year, and it continues to expand. We plan to make the journal available online later in 2005. A special issue is scheduled for November 2005, which will be entitled 'Recent developments in the Three Rs'. The concept of the Three Rs was developed by the eminent UFAW scientists William Russell and Rex Burch almost 50 years ago. Dr William Russell presented the paper 'A research on the history and progress of humane experimental techniques' at the 1955 UFAW Annual General Meeting. This paper, published in UFAW's technical news-sheet *UFAW Courier*, described the principles that were to become known as the Three Rs — Replacement, Reduction and Refinement. The special issue of *Animal Welfare* will focus on recent developments in the Three Rs in science and teaching in the medical, veterinary, biological, conservation and related fields. We are delighted that William Russell will be contributing the lead article to this issue.



Sponsorship of educational initiatives

UFAW continues to sponsor national and international workshops and educational initiatives on a variety of topics. Recently, UFAW part-sponsored a session on breeding and welfare at the 2004 annual meeting of the British Society of Animal Science, and also the Second Caribbean and Latin American Workshop on Alternative Methods, which is one of a number of initiatives in the region with the aim of promoting the Three Rs. UFAW also part-sponsored the Brazilian Association for Laboratory Science's International Course on Laboratory Science, which took place in March 2005, with the aim of establishing high standards of training to prepare researchers for the appropriate use of animals in scientific experiments. UFAW continues to support the NORINA database on alternatives to animal experimentation and the European Resource Centre for Alternatives in higher education project (EURCA).

UFAW university links scheme

The aim of this initiative is to establish a network of UFAW representatives in universities and colleges to help with promoting the charity's objectives and to raise its profile. At present, 10 UK academic institutions have such representatives. As well as distributing information about UFAW to their colleagues and students, UFAW representatives carry out further activities to promote animal welfare science among their students. For example, with support from the link scheme, Dr Hannah Buchanan-Smith at the University of Stirling organised a very successful two-day meeting in February 2005 entitled 'Animality! Personality in Animals?'. This meeting, exploring the importance of personality and temperament in understanding behaviour, was attended by students and academics from the university's departments of psychology and biology. It also attracted interest from the Scottish media and was favourably reported on in an article in *The Scotsman*. As part of this meeting, Dr Buchanan-Smith spoke of her recent UFAW-supported work on the Three Rs, gave a presentation on the role and objectives of UFAW, and distributed information about the charity to the delegates. Dr Buchanan-Smith plans to use the remaining monies provided by the scheme to help support the popular departmental seminar series and to offer an undergraduate prize for the most innovative welfare research project.



The UFAW/Blackwell Animal Welfare Series is progressing well, with three books published so far and several more in the pipeline.

Vacation Scholarships

Since 1983, when the Vacation Scholarship scheme was launched, over 200 students have been able to develop and pursue their interests in animal welfare, and many have used the experience as a stepping-stone towards a career in promoting animal welfare through science. The range of topics studied has been very wide. Three 2004 Vacation Scholarship projects are outlined below as examples. Congratulations to the winners of the 2005 scholarships (see box). This year's Vacation Scholarship meeting will be held in December. Please see the UFAW website or contact the UFAW office for further details.

Devan Arumugam — Using eggs to measure stress in hens

The measurement of circulating stress hormone levels is one of a suite of observations commonly used to assess animals' welfare, but the required blood collection is itself a stressful procedure that can affect the levels of these hormones. UFAW has supported numerous studies aimed at developing non-invasive techniques for measuring stress. In 2001, for example, in a pilot study on hens, Professor Marian Stamp Dawkins (University of Oxford) showed that faecal measures of corticosteroids and their metabolites correlate very highly with levels in the blood, indicating that faecal measures could be used as a non-invasive technique for measuring stress. This technique has subsequently been adopted in several studies of stress in hens. Devan Arumugam (University of Glasgow) assessed whether it was possible to measure corticosterone levels in egg yolk as a non-invasive measure of stress, and, thus, an indicator of welfare. His study showed that this was possible, that the technique was robust, and that corticosterone levels were significantly lower in the yolk of eggs produced by free-range hens than battery-caged hens. Although it still needs to be validated against circulating levels of hormones, this technique offers the prospect of a cheap and relatively easy means of assessing stress in laying hens.

Peter Fleming — Scented products for domestic animals: a cause for concern?

The use of aromatic essential oils has become increasingly popular, with a range of effects claimed for the oils. Scented domestic animal products can now be found in many pet shops. Peter Fleming (University of Central Lancashire) investigated whether two essential oils widely used to scent small mammal bedding — lavender and lemon — affected behaviour. Lavender is commonly reputed to relieve stress, whilst a recent study on rats suggested that lemon essential oil may increase feelings of anxiety. The use of both in bedding may thus have implications for welfare. Peter studied the effect of exposure to sponges impregnated with the oils on the behaviour of male and female gerbils, assessing their behaviour after the introduction of the sponges, when subsequently placed into a cage containing an unfamiliar gerbil, and in an elevated plus-maze (a device used to assess rodents' emotional state). Peter found that exposure to lavender oil had little or no significant effect on behaviour. Gerbils exposed to essential lemon oil, however, showed increased levels of anxiety, avoiding social interactions with the unfamiliar gerbil and favouring those areas of the maze that were the most enclosed. Peter's findings raise concerns about the use of essential oils in retail products aimed at small mammals, particularly lemon, and indicate that further work needs to be carried out into their ill-defined, and potentially aversive, effects.

Vacation Scholars 2005

Alexandra Brunt, University of York, 'Salivary cortisol and heart rate responses of horses used in therapeutic riding programmes', under the supervision of Ms Katja van Driel.

Jemma Cartledge, University of Glasgow, 'Corticosterone levels in "furnished" caged egg yolk as an indicator of stress', under the supervision of Dr Ian Jeffcoate.

Ruth Clements, University of Edinburgh, 'Comparison of the acute and chronic effects on lambs of standard castration with tight rubber rings and "short scrotum" castration with tight rubber rings', under the supervision of Ms Ruth Layton.

Nina Cracknell, University of Lincoln, 'The effectiveness of the stimulus enhancement technique for training dogs', under the supervision of Professor Daniel Mills.

Lauren Horton, Royal Veterinary College, 'A further study into the effects of tree cover on the range on the welfare of free-range layer hens by observing animal behaviour', under the supervision of Professor Neville Gregory.

Gemma Houghton, University of Plymouth, 'Can rumination behaviour be manipulated for the benefit of welfare of captive exotic ruminants: duikers as a case study?', under the supervision of Dr Amy Plowman.

Mairéad Kilbride, University College Dublin, 'A study of parasitic load in mixed species exhibits in the National Zoological Gardens, Pretoria, and implications for zoo animal welfare', under the supervision of Dr Alison Hanlon.

Natalie Robinson, Royal Veterinary College, 'A study of swim circling and sucking stereotypies in Californian Sea Lions (*Zalophus californianus*)', under the supervision of Professor Neville Gregory.

Marianne Solberg, Oxford Brookes University, 'Social bonds and dominance hierarchies in captive groups of Bonobos (*Pan paniscus*): how important is the mother-son bond in Bonobo society, and what are the implications for welfare in captivity?', under the supervision of Professor Simon Bearder.

Feng Xiao, University of Bristol, 'Drive for information: preference for variability in rats and possibility of a novel environment enrichment', under the supervision of Dr Michael Mendl.

Beste Yuksel, University of Lincoln, 'Behaviour of ducklings in commercial and outdoor housing systems', under the supervision of Dr Jonathan Cooper.

Ben Garrod — Investigating the electrical environment of aquariums

It has been estimated that over 1 in 10 households in the UK own an aquarium and that these are home to around 140 million fish. To date, the welfare of these fish and the influence of their aquarium environment on them have attracted little study. Ben Garrod (Anglia Polytechnic University) investigated the impact of standard aquarium electrical equipment, such as pumps and heaters, on the welfare of the Black Ghost Knifefish (*Apteronotus albifrons*). These fish, members of the Gymnotidae family, are able both to sense and to generate weak electric currents and use these to navigate, to identify nearby objects and to communicate. By successfully training the weakly electric Knifefish to respond to an electrical stimulus indicative of a food reward and similar in frequency to the electric fields generated by the aquarium electrical equipment, Ben was able to show that the Knifefish were sensitive to these fields. He also showed that the behaviour of the Knifefish differed depending on whether the aquarium electric equipment was switched off or on, and that the fish spent over twice as long sheltering when the equipment was switched on compared to when it was off. A four-fold rise in time spent foraging was observed when the equipment was switched off, along with a greater range of behaviours. Ben is hoping to follow up some of the interesting questions about the aquarium environment raised by this study.



ADVICE, INFORMATION AND CONSULTANCIES

UFAW provides information and advice on aspects of the biology, management, health, welfare, and ethics of use of domestic and wild animals to government departments, non-governmental organisations, universities and others. The Federation is consulted on draft legislation, guidelines and codes of conduct relating to animal welfare, and staff serve on several national and international advisory committees and Working Groups including the Animal Procedures Committee, the Zoos Forum, the Companion Animal Welfare Council, and the Boyd Group. Some examples of these aspects of UFAW's work are outlined here. Staff also make visits to animal facilities to advise on best practice in animal care and welfare.

Working Group to improve the standard of enrichment for animals used in research

Robert Hubrecht has been working as a member of the Federation of European Laboratory Animal Science Associations (FELASA) Working Group on Standardization of Environmental Enrichment. This Group was established to address the perceived problem that a multitude of enrichment programs are in use, some of which have not been scientifically validated but which may have become popular through commercial pressures or because they were thought, anthropomorphically, to be beneficial. The Working Group has finished its work, in which it promotes a more standardised approach to the development of enrichment programs, and has submitted its draft to the FELASA board.

Animal Procedures Committee

Robert Hubrecht, as a member of the Animal Procedures Committee (APC) and chair of its Housing and Husbandry Subcommittee, has been working on ways in which the APC might address barriers to the implementation of high standards of animal husbandry. As an example of one area in which progress might rapidly be made, not all applicants to the major grant funding bodies are aware of the resources for improving husbandry conditions that are provided by these bodies.

Animal Welfare Award

UFAW is delighted to record that Robert Hubrecht was awarded the 2004 GlaxoSmithKline animal welfare award for outstanding contributions to the welfare of laboratory animals. Dr Hubrecht notes that the work that merited the award was carried out for UFAW, largely funded by UFAW and based on UFAW's world-leading scientific approach to animal welfare. As such, it represents an endorsement of UFAW's long-standing work in this field.

Dissemination of information

UFAW staff regularly attend meetings and visit research institutions in the UK and abroad to lecture on animal welfare, take part in ethical review processes or provide practical information on particular animal welfare issues. James Kirkwood was invited to speak on the distribution of the capacity for sentience in the animal kingdom at the Compassion in World Farming (CIWF) symposium 'From Darwin to Dawkins: the science and implications of animal sentience', held at the Queen Elizabeth Conference Centre in London in March 2005. He concluded his review: "We cannot avoid, until such time as there is much greater certainty about which species are sentient, having to make judgements based on the balance of two principles between which there can be some tension. The first is that since the matter is a morally important one, we should, as far as possible, give animals the benefit of the doubt and treat them as if they are sentient – as if they have the capacity for feelings and thus for suffering. The second is that efforts and resources for animal welfare should be prioritised and focused where they are needed, ie for sentient animals. The fact is that, despite the absence of a solid scientific basis for determining sentience, lines have to be drawn. In making such decisions it is important to be clear about what is proven fact and what is subjective judgement..., and of the costs and benefits." CIWF aims to publish the proceedings later in the year.

At a public meeting at the Science Museum's Dana Centre in March 2005, Robert Hubrecht gave a presentation on the welfare of genetically modified animals. These animals are increasingly used in research as models of human disease or to establish the genetic basis of human disorders. In December, Dr Hubrecht was invited to present a paper entitled 'Balancing human and animal needs' to the Parliamentary and Scientific Committee, along with the Nobel prize winner Sir John Sulston and Professor Tipu Aziz, a leading researcher into Parkinson's Disease. The meeting was well attended by representatives from both Houses of Parliament and by various representatives from interested governmental and non-governmental organisations. The issue of animal welfare in research was clearly of interest to many of the participants.

Input into European Legislation

In the last year, Robert Hubrecht has continued to provide technical input into the revision of the Council of Europe guidelines for the accommodation and care of laboratory animals. After nearly eight years, the groups of experts have finished their task, and the revised draft is awaiting approval at a Multilateral Consultation that is expected to take place in 2005. The revised

guidelines include a general section providing guidance relevant to all animals used for experimental and other scientific purposes, and supplementary guidance for commonly used species such as dogs, cats, ferrets, rodents and rabbits, farm animals and pigs, non-human primates, birds, fish, amphibians and reptiles. UFAW staff have also been providing input to the revision of the European Directive on the Approximation of Laws Governing Animal Experimentation, specifically on the species that should be within the scope of the Directive and the developmental stage for animals at which the likelihood of sentience is such that they should be included in the Directive.

Development of code of practice for the use of snares

James Kirkwood was asked by Defra in October 2004 to form an Independent Working Group to address issues surrounding the use of snares. Defra's context and background for this was: "The use of snares is permitted by the Wildlife and Countryside Act 1981 and is an effective tool for the management of pests. However, there are incidences where snares occasionally cause injury and possible death to the animals caught. Snares, provided they are set correctly, are not cruel. We believe the most effective way of ensuring snares are used correctly is to produce a code of practice to be endorsed and publicised by non-government organisations. In the last twenty-three years the use of snares has not been reviewed and the lack of information currently leaves practitioners open to inadvertently committing an offence, those determined to flout the law with a loophole to do so, and the enforcement authorities without clear guidance on when an offence has been confirmed. Defra is very interested in how we can improve the flow of information on best practice for the use of snares." Defra's objectives for the Group were:

- to seek agreement on good practice guidelines;
- to produce a code of good practice;
- to advise Defra on the next steps including approximate costs of each proposal;
- to report any significant issues that could not be resolved.

In approaching the task set out in the objectives, the Independent Working Group is undertaking a review of the use of snares in order to inform the way forward. Some organisations and individuals believe that the use of snares can be justifiable, whilst others hold the view that snares should never be used. The members of the Group are working together with the common aim of encouraging the use of alternative, more humane methods of control where appropriate and ensuring that snares are used to high standards and in accordance with agreed codes of practice, minimising risks to the welfare of both target and non-target animals. Dr Ian Inglis of the Central Science Laboratory is providing the Secretariat.

Workshop on controlled atmosphere stunning of poultry

A workshop, organised by UFAW and the Humane Slaughter Association (HSA) on the controlled atmosphere stunning (CAS) of poultry, was held at the headquarters of the British Veterinary Association in London on 27 May 2005. This was to follow up on discussions and issues that emerged at the workshop on this subject held at Silsoe in May 2004. The aim was to attempt to resolve the difficult and complex issues of interpretation of physiological and behavioural responses to CAS and the choice of gas mixtures. The workshop was attended by 18 scientists and others interested in CAS from six countries (five

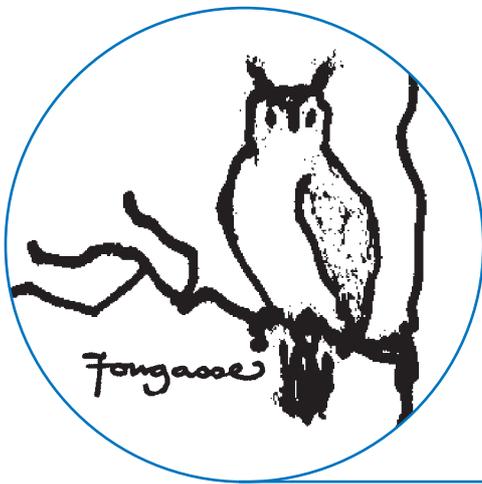
European, and the USA). Dr Dorothy McKeegan presented new data on electroencephalograms (EEGs) of poultry during CAS and discussed the significance of these results to the question of time to insensibility in birds exposed to various gas mixtures. Dr Mohan Raj also discussed the interpretation of EEGs and behavioural parameters as indices of sensibility in birds during CAS. Whilst there was agreement that CAS systems can have clear advantages over electrical stunning systems (eg birds are not inverted or shackled), decisions about which gas mixtures are the most humane remain difficult and somewhat subjective because the various CAS methods permitted in the UK appear each to have some advantages and disadvantages. The workshop identified the need for further research in the following areas, which UFAW and the HSA will be exploring:

- the relationship between various EEG parameters (specifically the complexity and total power of the EEG);
- development of improved methods for inferring/assessing levels of consciousness/sensibility (including further evaluation of EEG complexity as an index);
- investigation into whether birds (poultry species) are distressed by the sight of abnormal behaviours in conspecifics as may occur during stunning (collapse, convulsions etc);
- technical improvements to permit better visual monitoring during CAS;
- society's attitudes and views to various slaughter methods.

Pet food company appoints experts in animal welfare

In 2004, Robert Hubrecht was appointed as a founder member of the Iams Animal Care Advisory Board, which was established to help ensure that the company developed and maintained high standards of animal welfare. The Iams initiative in bringing in outside experts is to be applauded and has already resulted in substantial progress. Dr Hubrecht and various members of the board made unannounced site visits to the company's own sites and also to external sites in Europe and the USA. Recommendations resulting from the inspections included the provision of additional environmental enrichment, ensuring the social housing of animals, and improved record keeping and facility design. Based on the reports and the resulting recommendations, interim steps were taken to assist those sites to improve their programs and facilities to meet Iams' high standards of care and the Advisory Board's expectations, or to end the conduct of studies at those sites. New enclosures are now being designed which take into account many of the principles developed through UFAW research. The work has helped to inform discussions that have led to Iams committing to social housing of all of their study animals and to providing additional environmental enrichment at all of their sites.





ADMINISTRATION AND FINANCE

UFAW's activities, highlighted in this annual report, are dependent on the generosity and kindness of the charity's members and supporters — to whom we are most grateful. The charity spends very little on advertising and promotion and depends considerably on its members and supporters to assist with this by recommending the charity to others likely to share UFAW's commitment and philosophy. If you would like copies of this report to hand on to friends and relatives please let us know. The annual membership subscription remains a modest sum at £10, or £5 for students. The value of donations made to the charity is maximised when given through the Gift Aid Scheme; details of this and advice on how to make provision for the charity in a Will can be obtained from the Secretary and are also available on the website (www.ufaw.org.uk). The budgeted expenditure for the 2005/06 year is £1,075,725 and whilst Council is satisfied that the Federation's reserves are adequate to enable the costs of the planned activities to be met, the charity is seeking to be able to support a more extensive programme of animal welfare research and education in the future. Can you help?

Annual General Meeting 2004

The AGM was held at the Women's Institute Hall, Wheathampstead. As in previous years this was held in conjunction with the general meeting of the Humane Slaughter Association and Council of Justice to Animals (HSA & CJA). The members of UFAW Council also act as Trustees for the HSA. Joint meetings are held to save time and money.

The notice convening the meeting had been sent to all subscribers and was taken as read. The meeting agreed the Minutes of the AGM of 2003 and resolved to receive the Accounts and Auditor's Report for the year ended 31 March 2004. There were no questions on the Report of the year's work and the meeting resolved that the Report and Accounts be received.

It was resolved that Yianni, Neil & Co, Registered Auditors, be appointed as auditors to UFAW and its associated Trusts and their remuneration should be fixed by Council.

Dr John Sanford and Dr Barry Hughes retired from Council at the AGM and Dr Janet Dewdney stood down earlier in 2004 due to ill health. Three new members were elected to Council: Professor Andrea Nolan, Dean of the Faculty of Veterinary Medicine, University of Glasgow Veterinary School, Dr James C Anderson, retired from Animals Scientific Procedures Inspectorate, Home Office, and Mr Arthur Sains, Senior Strategy Consultant, Meat and Livestock Commission, 1971-2001. Regretfully, since the AGM in 2004 Dr Margaret Parry stood down from Council due to pressure from other business commitments.

Notice of Annual General Meeting 2005

The Annual General Meeting of the Universities Federation for Animal Welfare will be held at 3.00pm on Tuesday 11 October 2005 at The Women's Institute Hall, Mead Lane, Wheathampstead. The formal notice and agenda have been sent to all members and are available from the Secretary at the registered office.

Summarised accounts

The summarised accounts set out opposite have been extracted from the full accounts and have been prepared in accordance with the 2000 Statement of Recommended Practice — Accounting by Charities (SORP), which were approved by the Directors/Council and signed on its behalf on 13 July 2005.

The full accounts have been audited and the auditors' opinion was without qualification. The accounts will be filed with the Companies Registry and the Charity Commission after the Annual General Meeting on 11 October 2005. Full accounts and the audit report can be obtained from the Company Secretary, The Old School, Brewhouse Hill, Wheathampstead, Herts AL4 8AN.

Finance and Accounts

The Federation's income during the 2004/05 year was £612,584. The three events occurring during the 2003/04 financial year complicate comparison of income with the figures for the year 2004/05. These were (1) the transfer of the assets on 07.10.04 to the UFAW SAWI Fund of The Society for Animal Welfare in Israel (registered charity number 206494), amounting to £108,086; (2) the net surplus of £115,180 received on 12.06.03 from sale of UFAW's old office premises (8 Hamilton Close, Potters Bar); (3) the UFAW symposium Science in the Service of Animal Welfare held in Edinburgh generated income of £100,027.

Excluding these events, the like-for-like income is down by 38% on the 2003/04 year (2004/05 £612,584 : 2003/04 £993,097). This was largely attributable to a fall in legacy income of £406,174 from £743,339 in 2003/04 to £337,165 in the 2004/05 year. Legacy income of £7683 was received in the 2004/05 year for the restricted UFAW SAWI Fund. Legacy income varies unpredictably from year to year.

Investment income fell from £111,844 in 2003/04 to £107,562 in 2004/05. Overall expenditure during the 2004/05 year of £462,304 was down by £64,243 on the year 2003/04 (£526,547) during which £89,051 had been expended on the 2003/04 symposium.

Finance and Accounts

Summarised Financial Statements for the year ended 31 March 2005

BALANCE SHEET as at 31 March 2005

	2005	2004		2005	2004
	£	£		£	£
Incoming Resources			Fixed Assets		
Subscriptions, Donations & Grants	33,742	42,762	Tangible Fixed Assets	400,164	399,375
Donation – Transfer of SAWI Assets	-	108,086	Investments	<u>3,306,769</u>	<u>3,154,122</u>
Appeals	2,415	2,867		<u>3,706,933</u>	<u>3,553,497</u>
Garden Bird Project	30,116	-	Current Assets		
Surplus on Sale of Fixed Asset	-	115,180	Debtors	53,808	297,004
Investment Income	107,562	111,844	Money Market & Deposit Accounts	965,062	600,914
Interest on Bank Deposits	55,262	40,574	Cash at Bank and in Hand	<u>33,073</u>	<u>15,373</u>
Publications, Royalties & Lecture Fees	40,279	46,359		<u>1,051,943</u>	<u>913,291</u>
Meetings & Symposia	-	100,027	Current Liabilities		
Recoveries	6,043	5,353	Creditors: Amounts Falling Due Within One Year	(68,603)	(90,408)
Legacies	<u>337,165</u>	<u>743,339</u>	Net Current Assets	<u>983,340</u>	<u>822,883</u>
Total Incoming Resources	<u>612,584</u>	<u>1,316,391</u>	Total Assets less Current Liabilities	<u>4,690,273</u>	<u>4,376,380</u>
Resources Expended			Creditors: Amounts Falling Due After More Than One Year	<u>(90,322)</u>	<u>(83,065)</u>
Direct Charitable Expenditure	309,002	376,929	Net Assets	<u>4,599,951</u>	<u>4,293,315</u>
Other Expenditure	<u>153,302</u>	<u>149,618</u>	Funds		
Total Resources Expended	<u>462,304</u>	<u>526,547</u>	Unrestricted (includes £105,613 revaluation reserve). (2003 £224,006)	4,221,746	3,920,794
Net Incoming Resources for the Year	<u>150,280</u>	<u>789,844</u>	Restricted	<u>378,205</u>	<u>372,521</u>
Other Recognised Gains & Losses:				<u>4,599,951</u>	<u>4,293,315</u>
Gain/(Loss) on Disposal of Assets	<u>11,113</u>	<u>(2,564)</u>			
Net Income/(Expenditure) for the Year	<u>161,393</u>	<u>787,280</u>			
Net Realised Gain/(Loss) on Investments	8,902	13,721			
Net Unrealised Gains/(Losses) on Investments	<u>136,341</u>	<u>82,072</u>			
Net Movement in Funds	<u>306,636</u>	<u>883,073</u>			
Balance Brought Forward	<u>4,293,315</u>	<u>3,410,242</u>			
Balance Carried Forward	<u>4,599,951</u>	<u>4,293,315</u>			

The summarised accounts were approved by Council and signed on its behalf on 13 July 2005.



Peter Biggs CBE DSc DVM FRCPath CBiol FIBiol FRS FRCVS
Chairman UFAW Council



Mike Bird FCA
Treasurer UFAW Council

Independent auditors' statement to the Council of the Universities Federation for Animal Welfare

We have examined the summarised financial statements which comprise the summary statement of financial activities and summary balance sheet.

Respective responsibilities of the Council and auditors

You are responsible as the Council for the preparation of the summarised financial statements. We have agreed to report to you our opinion on the summarised financial statements' consistency with the financial statements, on which we reported to you on 13 July 2005.

Basis of opinion

We have carried out the procedures we consider necessary to ascertain whether the summarised financial statements are consistent with the full financial statements from which they have been prepared.

Opinion

In our opinion the summarised financial statements are consistent with the full financial statements for the year ended 31 March 2005.



Gianni, Neil & Co, Registered Auditors
London, 13 July 2005



UFAW AWARDS

UFAW's top priorities are promoting high-quality science that will lead to substantial advances in animal welfare, and promoting education in animal welfare — particularly at the tertiary level. Funds permitting, awards are given to support a wide range of project types. For those considering making an application to UFAW, these are outlined below. For further details of the awards listed here, please contact the UFAW office or refer to the UFAW website: www.ufaw.org.uk.

Hume Animal Welfare Research Fellowship

This scheme aims to promote high-quality animal welfare science. These awards are to support post-doctoral research and are offered on an occasional basis only (funds permitting). Calls and application details for this award are published in the scientific press.

We are pleased to announce that the second UFAW 'Hume' fellowship has been awarded to Dr Johanneke van der Harst, of Utrecht University. Johanneke will study "Anticipatory behaviour as a multi-functional tool for the field of animal welfare research".

Animal Welfare Research Training Scholarships

Projects must aim to address issues likely to lead to substantial advances in animal welfare. Since 1998, five of these scholarships have been awarded to support promising young graduates to undertake three-year research projects leading to PhD or equivalent degrees. Calls for initial concept notes, to be submitted by supervisors, will be advertised in the scientific press when these opportunities are available.

Vacation Scholarships

This scheme provides opportunities for students to develop their interests in animal welfare, encourage a scientific approach to the issues, and establish a starting point for further, longer-term research into improving the lives of animals. The scholarships provide for living expenses and research costs to enable students at UK universities/colleges to carry out projects lasting up to eight weeks during a summer vacation. Funds permitting, about 12 scholarships are awarded annually. Scholars must submit a report of their studies to UFAW and will be asked to present their work at a Vacation Scholars' meeting. These awards are advertised via university and college departments in the last quarter of each year.

Small Project and Travel Awards

UFAW makes a limited number of awards to support travel in connection with advancing animal welfare, and makes a number

of other small awards (up to £3500) to support welfare research or other projects. These awards are open to persons in the UK and overseas. Applications are judged on their merits for animal welfare, their scientific quality (in the case of research applications), and also in relation to the other applications received. UFAW particularly welcomes applications for pilot studies where there is a likelihood of successful completion leading to further, more substantial work. Applications must be made using the standard form available from the UFAW office.

Research and Major Project Awards

UFAW occasionally makes more substantial awards (over £3500) for research or other animal welfare projects (eg for educational initiatives or publications). Judging criteria are as for the Small Project and Travel Awards. Further information and application forms are available from the UFAW office. Brief concept notes must be submitted for preliminary comment before making applications for awards of over £5000.

Wild Animal Welfare Award

This prize is awarded to the winner(s) of a competition for the best innovation for the welfare of captive wild animals (in zoos, rehabilitation centres or elsewhere) or for alleviating or preventing human harm to animals in the wild. If the judges believe the applications are of sufficient merit, UFAW will offer two awards, each of £1000 — one for the best innovation for the welfare of captive wild animals, and the other for the best innovation for the welfare of free-living wild animals. Applications for these awards will be invited from October 2005. Please contact the UFAW office for details.

The 2004 award was awarded to Dr Jonathan Reynolds (below, right) of the Game Conservancy Trust for his innovative mink raft. This device allows the predators to be trapped without harming other species, such as the water vole, numbers of which have declined by 90% in some areas and which is now a priority species under the UK Biodiversity Action Plan. The mink raft is now widely used by wildlife conservation organisations throughout the country and the project has received considerable publicity. The award was presented by Mr Ben Bradshaw (left), Minister for Nature Conservation and Animal Welfare, at the Royal Geographical Society in London in September 2004.



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