# Animal Welfare

# Volume 15 Issue 4

# Obituary

# Articles

Halal slaughter, stunning methods and blood loss Glucocorticoids as indicators of stress Individual housing of mouse and rat Housing of budgerigars Salivary cortisol in dolphins Primate colour effects on aggression Housing and handling effects on cat adoption Long-term social memory in rats Inducing oestrus in sheep at weaning

**Reports and Comments Book and CD-ROM Reviews** Letter 2005-2006 Referees Index to Volume 15

Now available online Published by the Universities Federation for Animal Welfare — Science in the Service of Animal Welfare

# November 2006

# Animal Welfare

#### ISSN 0962-7286

Editor-in-Chief: James K Kirkwood Publications Officer: Elizabeth Roberts Editorial Assistants: Louise Wiskin, Rosemary Moore, Steve Weddell Administrative Officer: Samantha Griffin Administrative Assistant: Wendy Goodwin

#### **Section Editors**

#### Laboratory animals

Professor Jann Hau Division of Comparative Medicine. University of Uppsala BMC Box 572 751-23 Uppsala, Sweden

#### Ethics, philosophy and social science

Professor Peter Sandøe Centre for Bioethics and Risk Assessment Royal Veterinary and Agricultural University Groennegaardsvej 8 DK-1870 Frederiksberg C, Denmark

#### General animal welfare science

Professor David Fraser Animal Welfare Program Faculty of Agricultural Sciences and Centre for Applied Ethics University of British Columbia 2357 Main Mall Vancouver V6T 1Z4, Canada

#### Farmed mammals and fish

Professor Berry M Spruijt Ethology and Welfare Group Department of Animals, Science and Society Faculty of Veterinary Medicine Utrecht University PO Box 80. 166 3508 TD Utrecht, The Netherlands

#### Companion animals - cats and dogs

Professor Dennis C Turner Institute for Applied Ethology and Animal Psychology Vorderi Siten 30, PO Box 32 CH-8816 Hirzel, Switzerland

#### **Companion animals**

Professor Daniel S Mills Animal Behaviour, Cognition and Welfare Group Department of Biological Sciences University of Lincoln, Riseholme Park Lincoln LN2 2LG, UK

#### Poultry

Professor Joy Mench Department of Animal Science 2245 Meyer Hall, University of California Davis CA 95616-8521, USA

#### Wild animals

Dr Kate E Littin\* Animal Welfare Group, Biosecurity New Zealand Ministry of Agriculture and Forestry Pastoral House, 25 The Terrace PO Box 2526, Wellington, New Zealand (\* c/o The UFAW Editorial office until September 2006)

#### Zoo animals

c/o Editorial Office, UFAW The Old School, Brewhouse Hill Wheathampstead, AL4 8AN, UK

#### **Editorial Advisers**

Dr Robert Baker — Adelaide, Australia Dr MF Bouissou — INRA, Nouzilly, France Professor D Broom --- University of Cambridge, UK Professor M Stamp Dawkins — University of Oxford, UK Mr Roger Ewbank — Ealing, London, UK Dr Michael Festing — University of Leicester, UK

Professor Benjamin Hart — University of California, Davis, USA Professor David Morton — University of Birmingham, UK Dr James Serpell — University of Pennsylvania, USA Professor John Webster — University of Bristol, UK Professor Piet Wiepkema — Oosterbeek, The Netherlands

Animal Welfare (ISSN 0962-7286) brings together the results of scientific research and technical studies related to the welfare of animals kept on farms, in laboratories, as companions, in zoos or managed in the wild.

Subscription rates: Individuals £75/US\$150 per Volume; Corporate/Institutes/Libraries £200/US\$400 per Volume. Orders: Can be made direct to UFAW and are accepted by Volume, which comprises four issues per year.

Papers: Instructions for authors are summarised on the inside back cover; comprehensive instructions are available from our website, or on request from UFAW. Manuscripts should be submitted preferably to the appropriate Section Editor, or to the Editor-in-Chief. Animal Welfare is abstracted in Biological Abstracts; CAB Abstracts; Current Contents/Agriculture, Biology and Environmental Sciences; Current Primate References; EMBASE; Focus on: Veterinary Science & Medicine; Humans & Other Species; Research Alert; SciSearch; Toxicology Abstracts; Veterinary Update; is indexed in Zoological Record; and is covered by the Science Citation Index.

#### © 2006 UFAW

All rights reserved; no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the Publisher. Opinions expressed by authors do not necessarily reflect the views of UFAW, its Council, Staff, Members or Associates, the Section Editors or the Editorial Advisers.

> **Published by** Universities Federation for Animal Welfare The Old School, Brewhouse Hill, Wheathampstead, Herts AL4 8AN, UK Tel: +44 1582 831818 Fax: +44 1582 831414 Web: www.ufaw.org.uk

Universities Federation for Animal Welfare



Science in the Service of Animal Welfare

# Animal Welfare

ISSN 0962-7286

### Volume 15 Issue 4

### November 2006

### Contents

### Obituary

#### Articles

Comparison of Halal slaughter with captive bolt stunning and neck cutting in cattle: exsanguination and quality parameters	325
MH Anil, T Yesildere, H Aksu, E Matur, JL McKinstry, HR Weaver, O Erdogan, S Hughes and C Mason	
Can non-invasive glucocorticoid measures be used as reliable indicators of stress in animals? J Lane	331
The effects of individual housing on mice and rats: a review TC Krohn, DB Sorenson, JL Ottesen and AK Hansen	343
Effects of aviary and box sizes on body mass and behaviour of domesticated budgerigars (Melopsittacus undulatus) SG Gebhardt-Henrich and A Steiger	353
Salivary cortisol in captive dolphins (Tursiops truncatus): a non-invasive technique C Pedernera-Romano, RA Valdez, S Singh, X Chiappa, MC Romano and F Galindo	359
Artificial colour treatment mediates aggression among unfamiliar vervet monkeys (Cercopithecus aethiops): a model for introducing primates with colourful sexual skin MS Gerald, A Weiss and JE Ayala	363
The effect of housing and handling practices on the welfare, behaviour and selection of domestic cats ( <i>Felis sylvestris catus</i> ) by adopters in an animal shelter N Gourkow and D Fraser	371
Long-term social memory in the laboratory rat ( <i>Rattus norvegicus</i> ) OHP Burman and M Mendl	379
Reducing mother-young separation distress by inducing ewes into oesrus at the day of weaning I Pérez-León, A Orihuela, L Lidfors and V Aguirre	383
Reports and Comments Royal Society comments on European Food Safety Authority report on aspects of the welfare of research animals Newcastle consensus meeting on carbon dioxide euthanasia of laboratory animals Review of livestock movement controls in the UK The humaness of badger dispatch procedures in the randomised culling trial for the control of bovine TB in the UK South Asian edition of the World Zoo and Aquarium Conservation Strategy NC3Rs Guidelines on primate accommodation, care and use	391
Book and CD ROM Reviews Lameness in sheep BSAVA Manual of Canine and Feline Endocrinology, 3rd edition Bioethics: An Introduction for the Biosciences Bovine surgery and Lameness, 2nd edition Responsible Marine Aquaculture Wildlife: Oil Spill Response	395
Letter	401
2005-2006 Referees	402
Index to Volume 15	403

**On the cover:** Budgerigar (*Melopsittacus undulatus*) by Daniel Zupanc, NHPA. For a related paper, see Gebhardt and Steiger, pp 353-358, this issue.

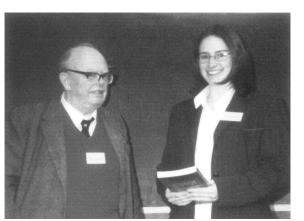
Universities Federation for Animal Welfare



## Obituary

# Professor William Russell

(1925-2006)



Professor Russell awards UFAW Vacation Scholars' prize to Kirsten Howard (Aberdeen University) at Bristol University in February 2000.

We were sorry to hear of the death of Professor William (Bill) Russell on the 27th July 2006. Bill joined UFAW from Oxford University in October 1954 to undertake a project on the development of humane experimental technique. His assistant, Mr Rex Burch, was appointed a few weeks later. Soon after starting this project Bill gave a presentation at the UFAW AGM on 11th February 1955 in which he said of his study: "I believe it is also one of immense promise for the welfare of large numbers of animals and I can only hope that its outcome will be as gratifying as the other achievements we have heard about tonight". He was quite correct about its immense promise – his and Rex Burch's book *The Principles of Humane Experimental Technique*, published in 1959, has had a huge impact. It founded and set out the concept of the Three Rs – replacement of the use of sentient animals where possible, reduction of the numbers used to the minimum necessary to achieve the objective, and refinement of care and techniques to minimise the risks of harm to welfare.

Bill won a scholarship to Oxford to study classics but, on returning from a break of several years spent in the army during the war, he switched to zoology and was awarded a first class degree. After then gaining a DPhil in animal behaviour he worked as a Research Fellow at Oxford until moving to UFAW. With his extraordinarily encyclopaedic knowledge (of both science and the arts), his capacity for rigorous intellectual argument and his skill as a writer, he was the ideal person to take on the task offered to him by UFAW's founder Major Charles Hume. *The Principles of Humane Experimental Technique* was an outstanding and world-changing piece of work that has led to huge benefits for the welfare of animals and the quality of biomedical research around the world.

In an article (Russell, WMS 2005, *The three Rs past, present and future*. Animal Welfare 14, 279-286) in a special issue of this journal published just a few months ago to mark the 50th anniversary of the first year of his study, Bill wrote: "At 80 years of age, with a feeling that I have rather done my bit in this field, and with Rex no longer with us, it is a great joy to know that hundreds of fine scientists, all over the world, are pursuing research in and promotion of the Three Rs. UFAW began it all and, despite the demands of the many other aspects of animal welfare science to which it is committed, has quietly and steadily continued to pursue and promote humane experimental technique".

We are most grateful to Bill for his huge contribution to UFAW's efforts for animal welfare and to his original and cheerful perspectives on many other matters also.

James Kirkwood