

# Animal Welfare

Volume 14 Issue 3

August 2005

## Articles

*Novel flooring and dustbathing behaviour of caged hens*

*Salivary cortisol and behaviour in captive gorillas*

*Mirrors in rabbit cages*

*Conjoint analysis used to assess dairy cow welfare*

*Food preferences of capuchin monkeys*

*Gavaging laboratory rats*

*Social conditions and captive tiger behaviour*

*Genetically modified animals in research*

*Housing alters immune function in mice*



## Reports and Comments

## Book Reviews

## Selected Abstracts

## Letters

# Animal Welfare

ISSN 0962-7286

**Editor-in-Chief: James K Kirkwood**  
**Publications Officer: Elizabeth Roberts**  
**Editorial Assistant: Louise Wiskin**  
**Administrative Officer: Samantha Griffin**  
**Administrative Assistant: Wendy Goodwin**

## Section Editors

### Farmed mammals and fish

Professor Berry M Spruijt  
Ethology and Welfare Group  
Faculty of Veterinary Medicine  
Utrecht University  
Yalelaan 17  
3584 CL Utrecht, The Netherlands

### 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

### Companion animals

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

### Laboratory animals

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

### Poultry

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

### Zoo and wild animals

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 £50/US\$100 per Volume; Corporate/Institutes/Libraries £70/US\$140 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.

© 2005 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 14 Issue 3

August 2005

## Contents

### Articles

- The effects of novel floorings on dustbathing, pecking and scratching behaviour of caged hens 179  
*RJN Merrill and CJ Nicol*
- Salivary cortisol and behaviour in an all-male group of western lowland gorillas (*Gorilla g. gorilla*) 187  
*CW Kuhar, TL Bettinger and ML Laudenslager*
- The effects of mirrors on the welfare of caged rabbits 195  
*SE Jones and CJC Phillips*
- The use of conjoint analysis to determine the importance of factors that affect on-farm welfare of the dairy cow 203  
*LJ Angus, H Bowen, LAS Gill, TG Knowles and A Butterworth*
- How tufted capuchin monkeys (*Cebus apella*) rank monkey chow in relation to other foods 215  
*E Addressi, M Stammati, G Sabbatini and E Visalberghi*
- The welfare impact of gavaging laboratory rats 223  
*M Bonnichsen, N Dragsted and AK Hansen*
- A comparative study of the influence of social housing conditions on the behaviour of captive tigers (*Panthera tigris*) 229  
*M De Rouck, AC Kitchener, G Law and M Nelissen*
- Genetically modified animals in research: an analysis of applications submitted to ethics committees on animal experimentation in Sweden 239  
*A Nordgren and H Röcklinsberg*
- Housing environment alters delayed-type hypersensitivity and corticosterone concentrations of individually housed male C57BL/6 mice 249  
*GN Neigh, SL Bowers, B Korman and RJ Nelson*

### Reports and Comments

- 259  
*Israel bans foie gras production*  
*Guide to the management of feather pecking and cannibalism in free range laying hens*  
*Heat stress in poultry*  
*European Food Safety Authority's Scientific Panel on Animal Health and Welfare publishes its report on the welfare aspects of various systems of keeping laying hens*  
*New European Council Regulation on the protection of animals during transport*  
*New Zealand's Codes of Welfare for Animals in Zoos and Circuses*  
*Welfare Quality Project launches new electronic newsletter*

### Book Reviews

- 265  
*Complementary and Alternative Veterinary Medicine Considered*  
*Emerging Equine Science*  
*The Oxford Companion to the Mind (Second Edition)*  
*Poultry Behaviour and Welfare*  
*Wildlife Tourism: Impacts, Management and Planning*  
*The Laboratory Mouse*

### Selected Abstracts

### Letters

- 273
- 275

**On the cover:** Siberian tiger, by David Higgs. Photograph supplied by the Natural History Photographic Agency, Ardingley, Sussex. For a related paper, see De Rouck et al, pp 229–238, this issue.