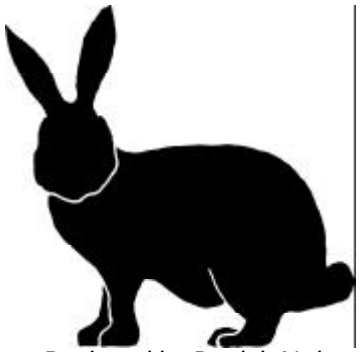
Comfortable Quarters for Laboratory Animals

Eighth Edition, 1997

Edited by Viktor Reinhardt

Foreword by John Gluck

Animal Welfare Institute
PO Box 3650
Washington, DC 20007



Designed by Patrick Nolan

TABLE OF CONTENTS

FOREWORD

by John Gluck

Recently, as I walked to my university office, I found that my typical path was blocked by some new construction. As I routed around the interference I found myself passing by a set of basement stairs at the back of the chemistry department which had long disappeared from my daily awareness. However, twenty-five years ago these stairs, and the concrete windowless rooms to which they led, were a major part of my life. As a new assistant professor hired to start a primate laboratory, I had arrived on the campus before the construction of the new building and its laboratory space was completed. Both the enthusiasm I felt for my new job and the look in my chairman's eyes told me that I was not to languish until the facilities were completed. Therefore, as an interim arrangement, I negotiated with the chair of the chemistry department for the use of two vacant basement rooms in his building as a temporary laboratory and animal holding area.

The small rooms were constructed of unfinished concrete, were dimly lit, and contained only minimal air circulation. As I toured the space with the chemistry chair I was tempted to complain. He must have been aware of this fact as he took the time to tell me that the study of electromagnetic waves by the physicist Heinrich Hertz was serendipitously facilitated by the small room in which he conducted his experiments. Maybe I would get lucky too. The romance of the story too easily diverted my concern.

With the arrival of the first group of 15 rhesus monkeys imminent, I began to check surplus property outlets for housing equipment that could hold the monkeys until my laboratory was completed. I remember that as I inspected the available caging systems the selection criterion was basically whether the needed number of identical cages would fit into the rooms that I had at my disposal. How the monkeys would fit into these surroundings, and their subsequent response to the conditions, was more of a silent issue. The comfort of the cages for the animals was not a definitive concern. The reasoning was rather simple: the monkeys were more physically flexible than was the metal and concrete space that was available to me. In other words,

the structure of the rooms dictated the animal treatment. This utility-oriented perspective did not reflect, I think, a disinterest in the animals. Rather, it represented a kind of blindness brought about by my unitary and simplistic focus on the concept of experimental control and a reluctance to attribute feeling states to the animals. From this perspective what mattered in animal housing was whether the cages were uniform and "standard." Whether the experimental animals were comfortable in them was not the point. As long as the animals were not obviously harmed by the housing in the short term, and the cleaning and feeding functions could take place efficiently, the circumstances were judged to be adequate.

As this excellent volume shows, we have come a long way from this attitude. We now recognize that animal welfare and good science are inseparable. It is crucial both from a humane and scientific perspective that laboratory animals are comfortable in their surroundings. This volume also makes the obvious but profound point that before animals become "laboratory animals" they are first entities with an evolutionary history which shapes their physical and mental attributes, and a repertoire of species-typical behavior which both helps to define them and gives their lives meaning and purpose.

To house animals in ways that neglect these crucial considerations is both cruel and scientifically self-defeating. This book carries on the heritage of the previous editions in that it both informs and challenges us to go beyond what is often unreflectively considered "standard" housing on to the next level of compassion and scientific validity. Had I appreciated these issues twenty-five years ago I would have climbed those basement stairs and sought higher ground.

—John Gluck, Ph.D.
Professor, Department of Psychology
University of New Mexico

INTRODUCTION

Is it really necessary to provide laboratory animals with comfortable quarters? Yes, comfortable quarters are not only a safeguard for the well-being of laboratory animals but also a prerequisite for sound scientific methodology. It would, indeed, be naive to rely on research data collected from an animal who experiences discomfort, pain, fear, anxiety and/or distress resulting from spatial restriction (e.g., enclosure is too small to allow species-typical posturing and postural adjustment) or bodily restraint (e.g., involuntary immobilization during procedures) or who experiences depression and frustration resulting from the inability to show species-typical behaviors (e.g., social animals kept in barren single-cages/stalls). These experiences are reflected in an animal's physiological, psychological and behavioral responses to an experimental situation. These responses, however, differ from animal to animal because the experience is inherently subjective. It is impossible to do "scientific" research under such methodological conditions because the data collected are biased by unaccounted-for dependent variables such as distress, fear, anxiety, discomfort, depression, and boredom. *Comfortable Quarters for Laboratory Animals* offers suggestions and recommendations which minimize or eliminate such variables thereby maximizing the research animals' well-being and reducing the number of subjects required to achieve statistical significance of the research data.

The chapters of the new edition have been written by scientists and veterinarians who have demonstrated an active commitment to the humane and scientifically acceptable housing and handling of laboratory animals.

• Hannah M. Buchanan-Smith is a psychologist at the University of Stirling, Scotland. She has conducted field studies on the social behavior and ecology of New World monkeys in Bolivia. One of her main research interests is the assessment of behavioral responses of non-human primates to changes in their physical and social environment, and in particular to environmental enrichment.

• Michael R.A. Chance, a zoologist and pharmacologist, is one of the first investigators who, in the 1950s, drew attention to the fact that species-inappropriate housing conditions of rodents disturb experimental results and make toxicological tests unreliable "even" if the housing conditions are standardized, i.e., the same for all animals tested. Michael Chance was also a pioneer in species-appropriate, i.e., social housing arrangements for nonhuman primates. He developed with his colleagues B. Byrne, E. Johns and T.K. Pitcairn the tandem cage in the early 1980s which allows group-housed monkeys to be selectively separated for capture or handling. Michael Chance lives in Birmingham, United Kingdom, where he retired from the Experimental Pharmacology Department at the Medical School.

• Detlef W. Fölsch is Professor of Farm Animal Ethology and Management at the University of Kassel/Witzenhausen, Germany. He is one of the leading experts in chicken ethology. His extensive research and persistent commitment to animal welfare and responsible agriculture were instrumental in implementing the ban on battery cages for laying hens in Switzerland in 1986. His current research and teaching activities aim at developing and implementing new housing systems for all farm animals that are more acceptable from both an ecological and animal welfare point of view. Detlef Fölsch is Editor of the series *Animal Management, Ecology, Ethology, Health.*

• John Gluck is Professor of Psychology at the University of New Mexico. Author of *The Many Messages of Animal Welfare*, Dr. Gluck is an animal behavior consultant to the Rio Grande Zoo, was chair of the New Mexico State Board of Psychologist Examiners from 1992-93, and is a fellow of the American Association of State Psychology Boards.

• Temple Grandin wrote her widely recognized Ph.D. thesis on the effect of rearing environment and environmental enrichment on behavior and neural development in young pigs. She is Assistant Professor of Animal Science at Colorado State University. Her extraordinary sensitivity for the needs of animals have made her an internationally respected consultant to the livestock industry.

• Debbie Gunn-Dore earned her Ph.D. in Biomedical Science and Ethics at the University of Birmingham, United Kingdom. Her dissertation on the welfare and husbandry of the laboratory rabbit elaborates state-of-the-art standards for the species-appropriate housing of rabbits

• Geoff N. Hinch is an agricultural ethologist who has specialized in social behavior and species-appropriate management of farm animals with particular emphasis on cattle, sheep and goats. He is Senior Lecturer at the Department of Animal Science of the University of New England, Australia.

• Marlene Höfner is a lithographer and a graduate in agricultural science at the Department

of Animal Behaviour and Management at the University of Kassel/Witzenhausen, Germany. She is currently investigating new strategies of optimizing outdoor runs for laying hens.

• Robert C. Hubrecht is Deputy Director at The Universities Federation for Animal Welfare (UFAW) in Hertfordshire, United Kingdom. UFAW is the key organization in Europe for setting ethical and scientifically sound standards for laboratory housing and husbandry. Robert Hubrecht is an ethologist with comprehensive research and practical experience in the assessment of species-specific housing requirements of dogs, poultry, primates, rabbits, and rodents.

• Michael D. Kreger is a technical information specialist at the Animal Welfare Information Center (AWIC) at USDA's National Agricultural Library, Beltsville, MD. The AWIC collects and disseminates relevant information on welfare issues related to animals used in research, testing or education. Michael Kreger earned his M.S. at the University of Maryland's Department of Poultry Science where he investigated the physiological and behavioral effects of handling and restraint in reptiles.

• Christian C. Krohn is Senior Research Scientist at the Department of Animal Health and Welfare of the Danish Institute of Agricultural Science, Research Centre Foulum. He has done extensive research in basic and applied ethology of cattle and conducted numerous studies evaluating different management, feeding and rearing systems as they relate to the production, behavioral and physical health of cattle.

• Monica M. Lawlor is a psychologist specialized in ethology. She maintained a hamster colony for forty years and a rat colony for thirty years. Intermittently, she also kept and bred mice for extended periods of time. She conducted ground-breaking research in species-adequate housing arrangements for all three species. Monica Lawlor lives in London, United Kingdom, where she retired from the Psychology Department at Royal Holloway & Bedford New College.

• Geoff G. Loveridge is Operations Manager of the Waltham Centre for Pet Nutrition (WCPN) in Leicestershire, United Kingdom. After establishing a career in cat nutrition and husbandry—particularly in the fields of gestation, lactation and growth—and having maintained an SPF colony of cats since 1979, he has for the last ten years championed environmentally enriched housing for cats and dogs. He continues to be in charge of construction and husbandry programs at WCPN.

• Justin J. Lynch is a veterinarian and ecologist. Throughout his research career he has focused on all aspects of the behavior of Merino sheep. He is recognized internationally for his expertise in this area. Now retired from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) he works as an Honorary Research Fellow at the University of New

England, Australia.

• Lene Munksgaard is Senior Research Scientist at the Department of Animal Health and Welfare of the Danish Institute of Agricultural Science, Research Centre Foulum where she conducts research projects on ethology, stress physiology and welfare in cattle.

• Viktor Reinhardt is Laboratory Animal Consultant to the Animal Welfare Institute in Washington, DC. He did research in reproductive physiology, animal husbandry and ethology in guinea pigs, dairy and beef cattle, bison, muskox and nonhuman primates. From 1984 to 1994, he worked as clinical veterinarian and ethologist at the Wisconsin Regional Primate Research Center where he developed and implemented more species-adequate housing and handling conditions for macaques.

• William M.S. Russell is a zoologist who, with the late Rex L. Burch, when working for UFAW published in 1959 *The Principles of Humane Experimental Technique,* the pioneering book for animal welfare research that introduced the *Three Rs:* **replacement** of conscious animals by insentient material, **reduction** of numbers of animals used to obtain given information, and **refinement** of procedures to minimize the distress imposed on the animals still used. Since 1990 William Russell has been Emeritus Professor at the Department of Sociology, University of Reading; he remains actively involved in laboratory animal science and welfare.

• Marion Staack is a graduate agriculturist with a Master of Science degree in Applied Animal Behavior and Animal Welfare. She is collaborating with Detlef Fölsch in the project *Alternative Housing Systems for Poultry.*

This is the eighth edition of *Comfortable Quarters for Laboratory Animals*, which was first published in 1955 for free distribution by the Animal Welfare Institute. May the recommendations set forth in this book serve as an inspiration to all those who are committed to safeguard the well-being of research animals and the integrity of sound scientific methodology.

About the Animal Welfare Institute

The Animal Welfare Institute (AWI) is a non-profit charitable organization founded in 1951 to reduce the sum total of pain and fear inflicted on animals by humans. Specific goals are:

- *Humane treatment of laboratory animals and the development and use of non-animal testing methods.*

- *Ban on steel jaw traps and reform of other cruel methods for controlling wildlife populations.*

- *Prevention of trade in wild-caught exotic birds, and regulation of transport conditions for all animals.*

- *Preservation of species threatened by extinction.*

- *Reform of cruel treatment of food animals, such as intensive confinement in factory farms. AWI was a leading opponent of cruel slaughter methods in the 1950s.*

- *Encouragement of humane science teaching and prevention of painful experiments on animals by high school students.*