ESLAV-ECLAM-AAALAC Conference

June 17-18, 2024
Amsterdam, the Netherlands

PROGRAMME AND ABSTRACT BOOK

ESLAV

eclam
European College of Laboratory Animal Medicine

aaalac
INTERNATIONAL

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Foreword and welcome note

ESLAV-ECLAM-AAALAC 2024

On behalf of the organizing committee, we are delighted to welcome you to the ESLAV-ECLAM-AAALAC 2024 Conference, to be held in the vibrant city of Amsterdam on June 17-18, 2024. Following the Conference, the ESLAV-ECLAM Summer School will take place from June 19-21, offering additional opportunities for learning and continued professional development.

This year's conference theme, "Quality in Animal Care and Facility Management," highlights the importance of excellence in the field of laboratory animal science and medicine. Our program includes sessions on appropriate veterinary care, high standards of animal welfare, best practices in facility management, and the key role of effective leadership and communication.

As dedicated professionals in laboratory animal care and research, we are committed to promoting high veterinary, ethical, and scientific standards. Quality in animal care and facility management is essential for animal welfare, scientific integrity, regulatory compliance, and public trust. These efforts are crucial for advancing scientific knowledge and achieving medical breakthroughs while upholding our ethical and veterinary responsibilities.

We are excited to host this gathering of colleagues and experts. Your participation and contributions are key to the success of this event, and we look forward to engaging discussions, insightful presentations, networking opportunities, and collaborative exchanges that will drive our field forward. We also extend our gratitude to all the sponsors and exhibitors who made this event possible.

Welcome to Amsterdam, and we wish you a fruitful and inspiring conference.

The Organizing Committee

ESLAV-ECLAM-AAALAC 2024

SCIENTIFIC COMMITTEE

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Ngaire Dennison, University of Dundee, United Kingdom

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The organisers of ESLAV-ECLAM-AAALAC Conference 2024 wish to wholeheartedly thank all our generous exhibitors and sponsors for participating in the event!

SPONSORS

EXHIBITORS

Programme

17 June

SESSION 1 - VETERINARY CARE 09:00-12:25

08:00 - 09:00 REGISTRATION

09:00 - 09:10 WELCOME: ESLAV / ECLAM / AAALAC

09:15 - 09:45 KEYNOTE LECTURE
The Versatility of Veterinary Care
Caroline Johner, Max-Planck-Institute of Immunobiology and Epigenetics, Germany

09:50 - 10:00 CARE - digitalization of veterinary care
Søren Søgaard, Gubra

10:05 - 10:15 Just getting a number doesn't mean it's right: quality control approaches for clinical pathology in a laboratory animal core facility
Ingrid Bergin, University of Michigan

10:20 - 10:50 COFFEE BREAK / POSTERS / EXHIBITORS

10:50 - 11:25 KEYNOTE LECTURE
AAALAC Expectations and Typical Findings on Veterinary Care
Aurora Brønstad, DVM, PhD,, University of Bergen, Norway

11:25 - 11:35 Biosecurity and health monitoring in a zebrafinch facility
Anja Petrie, University of Aberdeen

11:40 - 11:50 The key role of the designated veterinarian on promoting culture of care: successful initiatives & challenges
Jordi L.Tremoleda, Queen Mary University London

11:55 - 12:25 Elevator's pitch - exhibitors

12:25 - 13:30 LUNCH / POSTERS / EXHIBITORS

SESSION 2 - ANIMAL WELFARE 13:30-17:05

13:30 - 14:00 KEYNOTE LECTURE
How Artificial Intelligence can be used to assess laboratory animal welfare
Matthew Leach, Newcastle University, UK

14:05 - 14:15 Looking into the future: Automating parturition detection in the home cage
Sara Capas-Peneda, i3S – Instituto de Investigação e Inovação em Saúde da Universidade do Porto; ICBAS School of Medicine and Biomedical Sciences, Universidade do Porto

14:20 - 14:30 The use of home cage analyzer technologies to study sex effects on laboratory mouse behaviour
Jordi L.Tremoleda, Queen Mary University of London

14:35 - 14:45 Numbers do matter – addressing sex bias and animal waste in research settings
Patricia Turner, Charles River

14:50 - 15:00 Environmental factors influence behaviour and physiology in rats
Paul Bernard, University of Prince Edward Island

15:05 - 15:35 COFFEE BREAK / POSTERS / EXHIBITORS

15:35 - 16:05 **KEYNOTE LECTURE**
AAALAC Expectations and Typical Findings on Animal Environment, Housing and Management
Delphine G. Denais-Lalième, DVM., Institute for Radiological Protection and Nuclear Safety, France

16:40 - 16:50 Emergency planning when working in-vivo: disaster plan vs. Business continuity management plan
Eva Maria Amen, F. Hoffmann-La Roche Ltd.

16:55 - 17:05 Tunnel-handling in a mouse breeding facility
Kristina Ullmann, Nuvisan ICB GmbH

17:15 - 18:30 ESLAV Annual General Meeting

18:30 - 20:30 Welcome reception & exhibitors' evening

18 June

SESSION 3 - FACILITY MANAGEMENT 09:15-12:05

09:00 - 09:30 **KEYNOTE LECTURE**
The conundrum of facility management: balancing different stakeholders with conflicting interests
Jan-Bas Prins, Leiden University Medical Centre, Leiden, The Netherlands

09:35 - 09:45 Big data and how to love it
Alice McNamara, Labcorp

09:50 - 10:00 Establishing an effective university system-wide incident reporting program
Stacy Pritt, Texas A&M University System

10:05 - 10:15 Implementation of an animal-free health monitoring (hm) program in a large academic institution. Key decisions, challenges, and opportunities
Diego Celdran-Bonafonte, the University of Arizona

10:20 - 10:50 **COFFEE BREAK / POSTERS / EXHIBITORS**

10:50 - 11:20 **KEYNOTE LECTURE**
AAALAC Expectations and Typical Findings on Programme Key Responsibilities
Maria Kamper, DVM, PhD, MBA, University of Manchester, UK

11:25 - 11:35 What happens when mouse genetics is overlooked: is it possible to fix a genetic chaos?
Viola Galligioni, Netherlands Institute for Neuroscience, Royal Netherlands Academy of Arts and Science

11:40 - 11:50 SWC site visit: how did we get there?
Eleni Amaniti, Sainsbury Wellcome Centre

11:55 - 12:05 Characterization of occupational murine allergens in Stanford research facilities
Stephen Felt, Stanford University

12:10 - 13:30 LUNCH / POSTERS / EXHIBITORS

SESSION 4 - LEADERSHIP AND COMMUNICATION 13:30-16:20

13:30 - 14:00 **KEYNOTE LECTURE**
One more time: What exactly is Leadership? And does it really matter?
David Schoorman, Daniels School of Business, Purdue University, USA

14:05 - 14:15 Promoting continuous incremental improvements to advance institutional culture of care
Patricia Turner, Charles River

14:20 - 14:30 Addressing compassion fatigue and culling related emotional distress in laboratory animal care: a workflow approach
Kelly Spanou, Netherlands Institute for Neuroscience, Royal Netherlands Academy of Arts and Sciences

14:35 - 14:45 Communication and transparency in research involving animals: importance and impacts
Pascal Ance, SILABE - Universite Strasbourg

14:50 - 15:20 **COFFEE BREAK / POSTERS / EXHIBITORS**

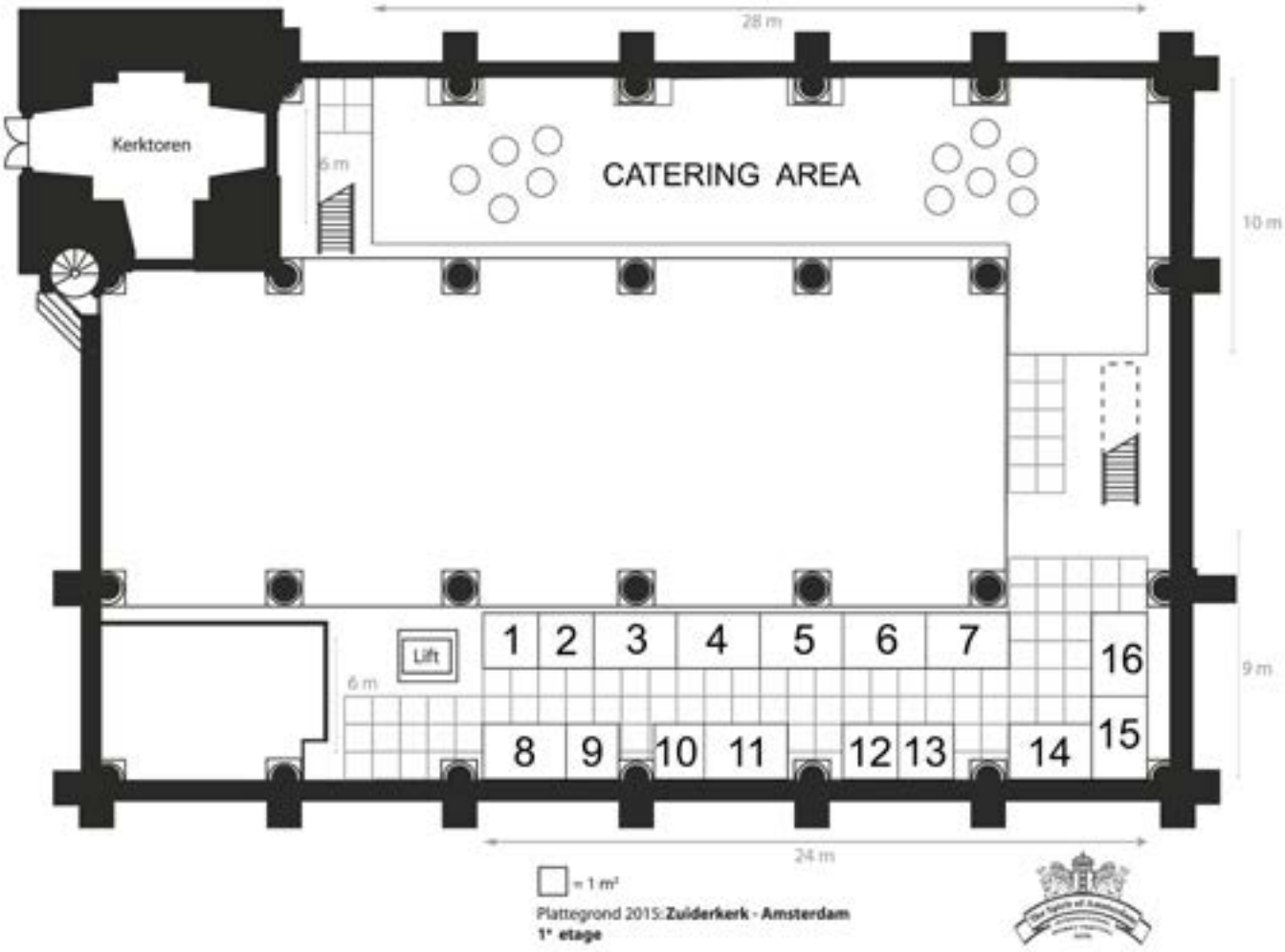
15:20 - 15:50 **KEYNOTE LECTURE**
The Importance of Effective Internal Communication: AAALAC Typical Findings and Expectations
Helena Paradell, Zoetis Manufacturing & Research, Spain

15:55 - 16:05 Empowerment of animal facility staff to improve staff and animal welfare
Ngaire Dennison, University of Dundee

16:10 - 16:20 There is only one welfare!
Kévin P. Dhondt, Charles River Laboratories - RMS France

16:25 - 16:30 **CLOSING: ESLAV / ECLAM / AAALAC**

Exhibition



1	Scionics	9	Fondazione Guido Bernardini
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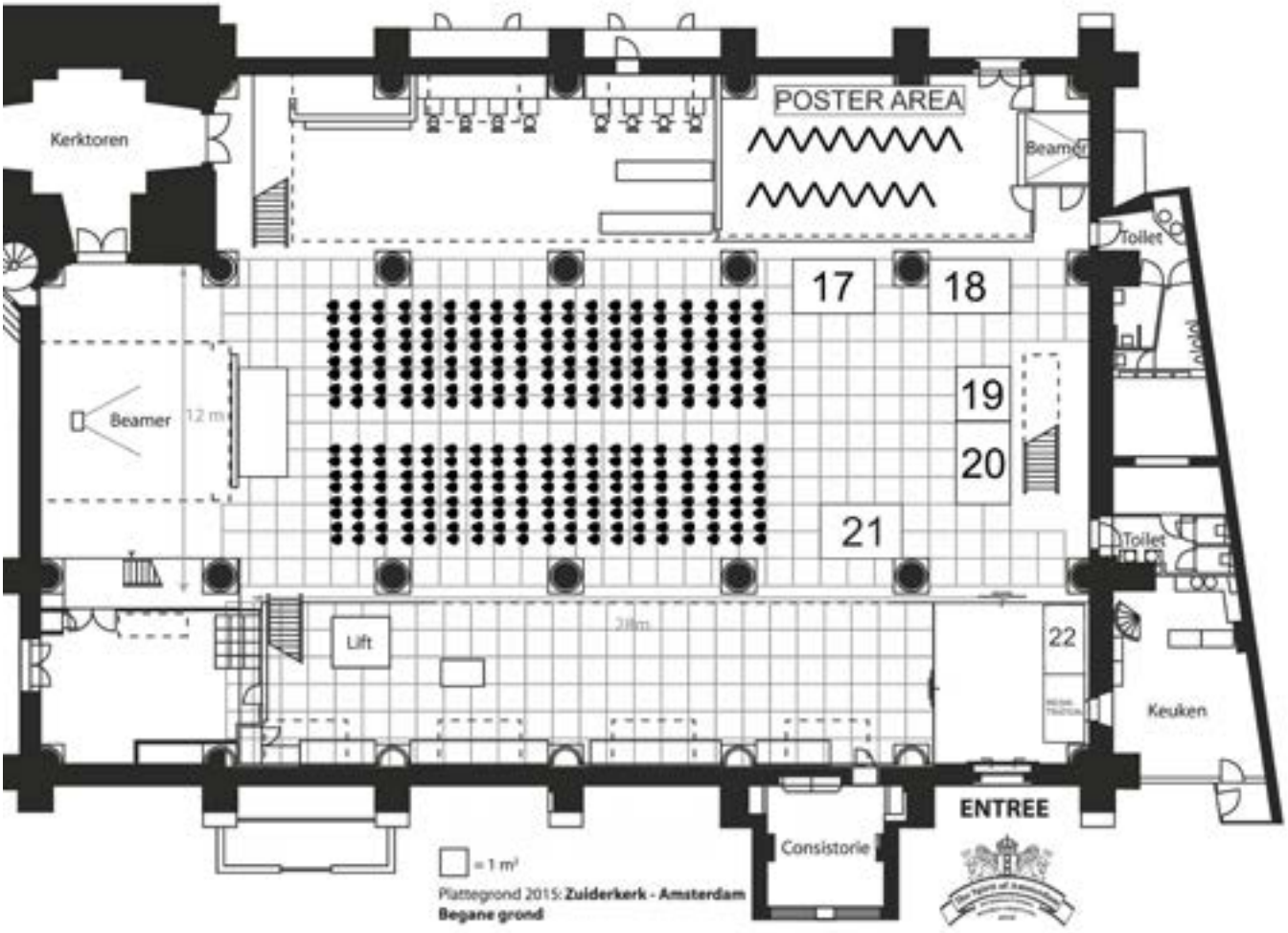
3	Vigilitech	11	UNO
4	Envigo	12	a-tune
5	Plexx	13	Transnytex
6	Sable	14	Tecnilab-BMI / Tecniplast
7	QM diagnostics	15	Tecnilab-BMI/ Tem Sega
8	ABEDD	16	Tecnilab-BMI/ SAFE



17 Kolo Medical
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22 ESLAV & ECLAM & AAALAC

Who are we?

Welcoming veterinarians or any nationality, the European Society of Laboratory Animal Veterinarians (ESLAV) gives veterinarians a forum to discuss issues which concern them, in the field of laboratory animal science, in general and in Europe specifically

Our objectives:

- To promote and disseminate expert veterinary knowledge within the field of laboratory animal science

Our Vision:

- To provide support to the role of veterinarian and to assist with advancing careers
- To promote high standards through the development of knowledge and skills
- To bring together veterinarians, represent and act on their behalf
- To liaise with other societies and monitor and share developments
- To provide CPD
- To facilitate communication and network to the members and the wider community
- To foster collaborations and work strategically with other groups.

Our partnerships:

- We are proud to have long-standing partnerships with AAALAC, AALAS, ECLAM, ETPLAS, EVERI, FELASA, LAVA and VetCEE. We have also recently started a partnership with EARA

Our Activities:

- We are collaborating with FELASA and ECLAM in a working group on the Roll of the Designated Veterinarian which aims to write detailed recommendations for the harmonization of the Designated Veterinarian role
- We are involved in the development of the ETPLAS e-module for DV's
- We continue to provide CPD via online webinars in association with the Karolinska Institute
- **Winter school,** spring 2025 (date to be confirmed) and then use the same picture and text as current
- **Summer school 2025**; call to be announced at AGM on 17th June
- Interested? Speak to a Member of the ESLAV Board, come and visit us at our stand or email Max Bardotti honorarysecretary@eslav.org

This 3 day event will take place in Cambridge, UK

Theme: Comparative medicine and translational science: improving the robustness of in vivo models

Topics covered will include*:

Species differences – do they matter?
Relevance and selection of animal models in modern drug discovery.
Complementarity of in vivo models and New Approach Methodologies (NAMs)
Call for registration expected Q4 23

- **Summer School and AGM 2024**
- *Date and venue to be announced in Tallinn!!*

eclam
European College of
Laboratory Animal Medicine

ECLAM – what do we do

- Organise training opportunities and scientific meetings
- Certify experts in laboratory animal science and medicine in Europe
- Dipl. ECLAM is the highest qualification for laboratory animal veterinarians in Europe
- Certified by the European Board of Veterinary Specialisation (EBVS)
- EBVS awards the title of European Specialist in Laboratory Animal Medicine

ECLAM – why should you join

- Drives your personal development
- You actively help to develop laboratory animal science & medicine
- Networking opportunities with other European experts
- Benefit for the research community for animal welfare
- Join a group of highly motivated laboratory animal veterinarians and scientists

ECLAM – expected knowledge and competence

- Make informed judgements based on non-routine and complex issues
- Define and refine problems by using a full range of investigative procedures and techniques
- Approach problems in an analytical & scientific way
- Find information quickly, organise work efficiently and act professionally

ECLAM – how to join

- Complete a one-year internship following your veterinary degree at a European university
- Get involved in scientific research and publish 2 original articles (of which one must be as primary author)
- Complete a 3-year residency and work in the field of laboratory animal medicine min. 60% full time equivalent
- Or apply as an international expert
- Sit and pass the written and oral exam

Are you interested? Come and visit us at our stand to find out more about ECLAM!

www.aaalac.org

About AAALAC International

Below are answers to some of the most common general questions about AAALAC International's organisation, governance and the accreditation programme. For more details please visit www.aaalac.org.

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What is AAALAC International?

AAALAC International is a private, nonprofit organisation that promotes the humane treatment of animals in science through a voluntary accreditation programme, a programme status evaluation service, and educational programmes.

How is AAALAC governed?

AAALAC International is governed by a Board of Directors. AAALAC is also advised by a House of Delegates which represents a wide variety of prestigious scientific, educational and professional organizations—they are referred to as AAALAC's "Member Organisations." Each of these Member Organisations appoints a Member Organisation Delegate to serve a three-year term in the House of Delegates. European Member Organisations include FELASA, ESLAV, ECLAM, NC3Rs, EFPIA, Interpharma, AO Foundation and IAT

What is the Council on Accreditation?

The Council is comprised of highly-accomplished animal care and use and research professionals from around the globe who conduct the programme reviews and final deliberations that determine which institutions are awarded AAALAC International accreditation. Their responsibilities include conducting site visits, reviewing site visit reports, evaluating information, reviewing yearly reports from accredited institutions, and conferring the accreditation status of institutions. European programmes are evaluated by the "European Section" of the Council, which is exclusively composed of European professionals.

Who are ad hoc Consultants/ Specialists?

AAALAC International maintains a worldwide pool of more than 350 ad hoc Consultants/ Specialists (including 60+ Europeans) who have expertise in traditional laboratory animal species as well as special expertise (for example, in aquatics, non-human primates or agricultural science). Many also have unique discipline competencies, such as applied neuroscience, behavioural science, toxicology, pharmacology or physiology. Ad hoc Consultants/Specialists accompany Council members on site visits and make recommendations on accreditation to the Council. These specialists add depth to the site visit team. They under-stand the intricacies of combining research, testing and educational missions with animal well-being.

Does AAALAC International make its own regulations and policies?

No, AAALAC is not a regulatory body and does not make or enforce regulations. Instead, AAALAC International relies on Three Primary Standards used by the Council to evaluate programmes: the European Convention for the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes, Council of Europe (ETS 123); the Guide for the Care and Use of Laboratory Animals (Guide), NRC 2011; and the Guide for the Care and Use of Agricultural Animals in Research and Teaching (Ag Guide, 2020). AAALAC International does publish "Position Statements" that can be used as supplemental guidelines in dealing with certain issues, such as the use of farm animals, occupational health and safety, or adequate veterinary care. AAALAC International also publishes its "Rules of Accreditation," a document that lists the minimum criteria institutions must meet before they can be considered for accreditation. (All of these resources can be found at www.aaalac.org under the "Accreditation" section.)

About AAALAC International

How extensive is an AAALAC International evaluation?

AAALAC evaluates all aspects of an animal care and use programme. An animal programme (as defined by AAALAC International) includes an organisation's procedures and overall performance in animal care and use. The basic components that are evaluated include (but are not limited to) institutional policies and responsibilities (includes ethical review process and OHSP); animal environment, housing and husbandry; veterinary care; and physical plant.

What deficiencies are most often noted by AAALAC site visitors?

The number and frequency of deficiencies found during site visits continues to decline. At any point in time, about 97 percent of all institutions currently participating in the accreditation programme have a fully accredited status. When problem areas are cited, they most frequently involve: animal environment (social housing, environmental enrichment); occupational health and safety; IACUC or Equivalent Oversight Body; or heating, ventilation and air conditioning systems.

Does AAALAC International accredit agricultural animal programmes?

Yes. Programmes that use agricultural animals in research or for teaching are embracing the AAALAC accreditation programme. Appendix A of the European Convention ETS123, the Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching (Ag Guide, 2020), and the Guide for the Care and Use of Laboratory Animals (NRC 2011) are used to provide general parameters for the use of agricultural animals. AAALAC recognises that the biomedical or agricultural research, testing or teaching objectives as well as the health and welfare of the animals will dictate when application of the recommendations of the Ag Guide, Guide, or ETS 123 is most appropriate. The collective professional judgment of the IACUC or comparable Oversight Body, principal investigator and veterinarian should determine which standard applies best with regard to the care and welfare of agricultural animals, based on a performance approach in the context of the requirements of the study and the species used. The rationale for making this determination should be documented.

Is accreditation available to small animal care and use programmes?

Yes. The standards used to evaluate programmes are universal and can be implemented in programmes of any size. Likewise, programmes using nontraditional research animals, such as fish or birds, are also encouraged to seek accreditation.

Does AAALAC use the same standards to evaluate animal programmes internationally?

Because each country has its own set of laws and regulations, AAALAC International site visitors use a customised approach for evaluating programmes internationally. Evaluators take into account applicable laws and regulations of the host country, and the overall performance of the programme as it relates to appropriate animal welfare objectives. They also evaluate the extent to which the programme conforms with the performance standards and principles outlined in the Three Primary Standards and other international reference resources. In Europe, the Guide is specially taken in consideration for those areas (e.g.: veterinary care) not well defined in the main European documents (ETS 123 and applicable legislation).

Are the results of an AAALAC site visit confidential?

The entire accreditation process is confidential. The accreditation evaluation and its results are kept between the organisation seeking accreditation and AAALAC International—even if deficiencies are found. AAALAC's purpose is to provide a peer-evaluation that results in valuable information that an organisation can use to improve its programme and achieve new levels of excellence. Board and Council members, ad hoc Consultants/Specialists and AAALAC staff are all required to sign confidentiality agreements. Conflict-of-interest statements are also signed by each site visitor. AAALAC representatives agree to treat all materials as privileged and safeguard the materials in their possession.

How does an institution maintain AAALAC accreditation?

Once accredited, an institution must file an annual report to AAALAC International, noting any changes and the current condition of the animal care and use programme. Each accredited institution is revisited and re-evaluated once every three years in order to maintain its accredited status.

How much does accreditation cost?

Organisations seeking and maintaining accreditation are asked to pay a one-time application fee and subsequent annual fees. Both of these fees are based on a sliding scale that generally correlates with the size of an institution's animal facility. An institution that has very few animals will pay much smaller fees than one that maintains a large vivarium and extensive support areas. The fees cover the cost of periodic site visits and administrative expenses (see www.aaalac.org/accreditation-program/fees-and-deadlines/).

How many animal care and use programs are accredited by AAALAC International?

More than 1,100 animal care and use programmes in 50 countries (more than 120 in 22 European countries) have earned AAALAC International accreditation. These programmes include academic institutions, commercial organisations, government agencies, hospitals, nonprof-it organisations, and biotechnology and pharmaceutical companies.



KEYNOTE SPEAKERS

Caroline Johner

Dr. Caroline Johner is Head of Experimental Lab Animal Facility at the Max-Planck-Institute of Immunobiology and Epigenetics in Freiburg, Germany. She also works as an external Animal Welfare Officer in a small CRO as well as a training facility. Caroline earned her veterinary medical degree from the Faculty of Veterinary Medicine of the Free University in Berlin, Germany. She is also a veterinary chamber certified laboratory animal science specialist.

Dr. Johner is former President of ESLAV, current honorary secretary of GV-SOLAS and current honorary treasurer of FELASA. She is member of several committees such as the institutional animal welfare body, the Committee for Animal Welfare through 4Rs in Experimental Research of the Max Planck Society, the local ethics committee and currently serves as an AAALAC ad hoc specialist.

“The Versatility of Veterinary Care”

Caroline Johner

By definition, veterinary care describes the work of a person whose job is to provide medical treatment to animals. Adequate veterinary care is a legal requirement in animal care and use programs. In research, lab animal veterinarians have a broad range of duties. The main role of the veterinarians is ensuring the health and well-being of animals. They oversee animal housing, health, and welfare. Veterinary care programs will largely depend on factors such as the variety of species and number of animals, distribution of facilities and the diversity and complexity of the activities involved. Providing veterinary care is a collaborative task not only provided by veterinarians but also by a variety of personas such as animal house staff and investigators. However, a veterinarian’s duties expands well beyond treating sick or injured animals. Regulatory, ethical and managerial aspects play an important role in the implementation of a successful veterinary care program.

Aurora Brønstad, D.V.M., Ph.D.

Aurora Brønstad, D.V.M., Ph.D. is the Chief Veterinarian at the Animal Facilities, Faculty of Medicine, University of Bergen, Norway. Dr. Brønstad received her veterinary medical degree from the Norwegian School of Veterinary Science, Norway, and a doctorate degree in physiology from the University of Bergen, Norway. She has experience in clinical veterinary medicine, research, and program management. Dr. Brønstad is a member of The Norwegian Association of Researchers, the Scandinavian Society for Laboratory Animal Science, and the European Society of Laboratory Animal Veterinarians, where she served as president from 2017-2019. Dr. Brønstad currently serves as a member of AAALAC International European Council on Accreditation.

"AAALAC TYPICAL FINDINGS AND EXPECTATIONS ON VETERINARY CARE"

Heinz Brandstetter, Dr. med. vet., University of Augsburg, Augsburg, Germany

The AAALAC International Council on Accreditation evaluates the quality and implementation of all elements of an animal care and use program, including all aspects concerning the provision of veterinary care. Within this area, there are significant aspects that have direct impact on animal welfare, such as animal procurement and transportation; preventive medicine, including biosecurity, quarantine and stabilization; clinical care management; emergency care provision; drug management; surgical management; pain and distress management, including anesthesia and analgesia; and euthanasia practices. In addition, the authority and resources given to the institutional veterinarians is paramount for the implementation of an effective veterinary care program. The findings identified during the evaluation site visits are categorized in Mandatory Findings (that must be corrected to obtain Full Accreditation) and Suggestions for Improvement (that in the opinion of the Council "should" be corrected, but on a voluntary basis). AAALAC International routinely collects and analyzes the information coming from the evaluation site visits. In this presentation, the most typical findings identified during site visits performed by the European Section of the Council on Accreditation in Europe, Africa and the Middle East between years 2021 and 2024 will be discussed, along with the AAALAC´s expectations for those particular aspects of the veterinary care program.

Matthew Leach

Matt is the Director of Comparative Biology Centre (CBC) at Newcastle University, UK. CBC supports all the research within the University that involves the use of animals. CBC is a 'Recognised as a centre of excellence for 3Rs innovation, education, and training across a breadth of research species. Matt leads a dedicated team of highly skilled technical and veterinary staff who strive to ensure the highest animal welfare and ethical standards are applied, whole balancing this with the requirements of our research community.

Matt is an experienced research scientist recognised for his research focusing on the health and welfare of a range of laboratory animal species. Matt currently leads a smaller specialist team of researchers (Pain and Animal Welfare Group) that focus on developing and validating of new methods of assessing health and welfare in a wide range of species including laboratory, companion, and farm animals. The group and their work have been successfully supported by both UKRI and industry funding in both the UK and Europe.

Matt is an experienced higher education teacher, who teaches on a wide range of topics at Newcastle University, and other institutions in the UK and elsewhere in the world. Matt's teaching focuses the welfare of laboratory animal species, the assessment of pain and distress in animals, the ethics of using animals in research and experimental design in in-vivo research. Matt also collaborates with Flaire Consultants to provide cutting edge e-learning resources on these and other topics that are currently used by organisations world-wide.

"How Artificial Intelligence can be used to assess laboratory animal welfare"

Matthew Leach[1], Stephen McGough[2], Satnam Dlay[3]

[1]Comparative Biology Centre, Newcastle University, [2]School of Computing, Newcastle University, [3]Emeritus School of Engineering, Newcastle University

The use of animals in biomedical research is often a contentious, and the welfare of these experimental animals remains critically important for both ethical and scientific reasons. The first step in ensuring the welfare of laboratory housed animals is to recognise potential pain, distress or illness and doing so is nowhere near as obvious as it may appear. Although the existing manual systems for assessing welfare can reliably and accurately reveal the existence of pain, distress, and illness, many of them are hampered by practical barriers including time and training; full automation of these scales would solve these problems and increase the widespread use of these scales. Recent advances in this domain have seen the use of state-of-the-art machine learning algorithms to fully automate the assessment of health and welfare in a range of animal species. This this presentation I will detail examples the application of machine vision and deep learning from other species and suggest how they can be applied to laboratory animal species. Examples of both existing systems and those under development will include Mouse Mapp and Smart Livestock Systems. Mouse MApp uses machine learning algorithms to fully automate the Mouse Grimace Scale (MGS) and Mouse Body Condition Scoring (BCS). Smart Livestock System (SLS) uses machine learning algorithms to fully automate the assessment of cattle gait, body condition score, and bodyweight.

Delphine G. Denais-Lalième, DVM.

Delphine G. Denais-Lalième, D.V.M. is Head of Laboratory Animal Resources – Designated Veterinarian, IRSN – Institut de Radioprotection et de Sureté Nucléaire (Institute for Radiological Protection and Nuclear Safety), Fontenay-aux-Roses, France, she is also the Deputy Head of a Research Service working on biologic and sanitary effects of exposure to ionizing radiations. Dr. Denais-Lalième earned her veterinary medical degree from the Toulouse National Veterinary School, France and a specialization level in Laboratory Animal Sciences and Medicine from Lyon National Veterinary School, France. She formerly worked for 15 years as Veterinarian, Service de Zootechnie, IRPF – Centre de Recherche Pierre Fabre, Castres, France. She is a member of the European Society of Laboratory Animal Veterinarians (ESLAV), and is a Past-President. She is also a member of the French National Commission of Animal Research (CNEA) and she is co-leading the French Network of Animal Welfare Bodies. She is a member of the AAALAC International Council on Accreditation.

"AAALAC TYPICAL FINDINGS AND EXPECTATIONS ON ANIMAL ENVIRONMENT, HOUSING AND MANAGEMENT"

Delphine G. Denais-Lalième, D.V.M., Institute for Radiological Protection and Nuclear Safety, France

The AAALAC International Council on Accreditation assess the quality and implementation of all elements of an animal care and use program, including aspects concerning animal environment, housing and management. Within this area, significant aspects have direct impact on animal welfare, such as the micro and macro environments (enclosures and room conditions), behavioral and social management, (including the environmental enrichment program), food, water and bedding quality and provision, sanitation ,, waste disposal, pest control, and finally weekend and holiday care.

Findings identified during site visits are categorized either in Mandatory Findings (that must be corrected to obtain Full Accreditation) or Suggestions for Improvement (that in the opinion of the Council should be corrected, but on a voluntary basis).

AAALAC International routinely collects and analyzes information coming from the site visits. In this presentation, the most typical findings identified by the European Section of the Council on Accreditation in Europe, Africa and the Middle East between years 2021 and 2024 will be discussed, along with the AAALAC´s expectations for those particular aspects of animal environment, housing and management.

Jan-Bas Prins

Jan-Bas Prins is the Director of the Biological Research Facility of the Francis Crick Institute, London (till 4/4/2024), and Professor of Laboratory Animal Science at Leiden University in the Netherlands. He did his PhD in Laboratory Animal Science with Professor Van Zutphen at the University of Utrecht. After post-doctoral projects at the University of Oxford, UK, and the Erasmus University, Rotterdam, The Netherlands, he became the head of the pre-clinical division of the Department of Pulmonary Medicine at the Erasmus Medical Centre. In 2002, he moved on taking the position of Director of the Central Animal Facility of the Leiden University Medical Centre in the Netherlands. In 2018, he took up the position at the Francis Crick Institute. He is a former President of FELASA.

He is a member of the Netherlands National Committee for the protection of animals used for scientific purposes, Chairman of Laboratory Animals Ltd, member of the Scientific Committee of the Fondazione Guido Bernardini on Education and Training in Laboratory Animal Science, Vice-President of the Institute of Animal Technology, and AAALAC ad hoc specialist.

“The conundrum of facility management: balancing different stakeholders with conflicting interests”

Jan-Bas Prins

Leiden University Medical Centre, The Netherlands

What are the characteristics of a successful facility manager? The most likely answers protects animal welfare, facilitates research, keeps the board out of trouble, stays within budget, keeps staff happy, …. In short, able to balance multiple, not necessarily aligned goals. Either way, the facilities manager, head or director - whatever the title - is someone who does not shy away from the many challenges and who is expected to master all the tricks of the trade - a diplomat, whether a veterinarian, a biologist or a purebred manager. It could be any one of them if indeed they come close to that famous five-legged sheep that can also relate to the societal pressures on research with animals, the debates about the validity of models and experimental results, and the challenges of technological innovations. The management of animal facilities is different from the management of other core facilities and should be recognised as such.

Maria Kamper, DVM, PhD, MBA

Dr. Maria Kamper is an expert in managing biological services facilities, currently leading as the Director of Biological Services Facility at The University of Manchester. Her academic background includes a degree in veterinary medicine, a PhD in Type 2 Diabetes, a postgraduate diploma in laboratory animal science, and a Master in Business Administration (MBA).

With vast experience in various prestigious roles, Dr. Kamper has served as a Manager at Karolinska Institute, Director of Laboratory Animal Services at Novartis Institute for Biomedical Research in Basel, Switzerland, and Laboratory Animal Facility Manager at EMBL in Italy.

At The University of Manchester, she is known for her commitment to fostering a high-service culture, collaborating with academic colleagues to evolve the facility's services to meet new research needs. Additionally, she is a council member of AAALAC International, engaging in the accreditation process.

Dr. Kamper's career is distinguished by her leadership and management skills, especially in the area of animal care, with notable achievements in establishing service-driven business models, strategic development, and designing facilities across Europe.

"AAALAC Expectations and Typical Findings on Programme Key Responsibilities"

Maria Kamper, DVM, PhD, MBA , University of Manchester, UK

The AAALAC International Council on Accreditation conducts thorough assessments of the entirety of an animal care and use program, scrutinizing all facets related to its core responsibilities. This process necessitates the identification of essential personnel and groups within the institution, assigning them necessary duties, authority, and resources. Critical roles include the Institutional Official (the highest authority on significant program decisions), the Designated/Attending Veterinarian, the animal facility Manager, and Oversight Bodies like the Animal Welfare Body, Ethics Committee, or Institutional Animal Care and Use Committee. Additionally, the roles of research teams, animal care staff, and relevant professionals, such as those in occupational health and safety, quality assurance, or maintenance, are vital. Clearly defining these responsibilities is crucial for the effective implementation of an animal program that prioritizes animal welfare. During site evaluation visits, findings are classified into Mandatory Findings (which must be addressed for Full Accreditation) and Suggestions for Improvement (recommended changes that are voluntary). AAALAC International consistently gathers and evaluates data from these visits. This presentation will explore common findings from site visits conducted by the European Section of the Council on Accreditation in Europe, Africa, and the Middle East from 2021 to 2024, highlighting AAALAC's expectations for managing core program responsibilities.

David Schoorman

Professor Schoorman is a professor of Organizational Behavior and Human Resource Management at the Daniels School of Business. He has been an instructor in Purdue's EMBA programs since 1990, and teaches in the areas of organizational behavior, negotiations, and human resource management. He has also developed a certificate program on Diversity in Leadership delivered biannually to a group of minority executives.

In 2007, Dr. Schoorman received the "Distinguished Educator" award from the Academy of Management. This career award is the highest award granted by the Academy of Management.

In 2006, Professor Schoorman was honored with an award by the Academy of Management Review for his article, "An Integrative Model of Organizational Trust" (with R. C. Mayer and J. H. Davis), Academy of Management Review (1995). This article was recognized as the "Most influential article published in the decade of the 1990's."

His impact continues in the scientific community as his research has been cited over 50,000 times making him the most influential research scholar at the Daniels School of Business. His research has examined the role of interpersonal trust between leaders and subordinates, trust repair, and the impact of trust on individual and organizational outcomes. He has also published a number of papers on stewardship in organizations, decision making, leadership and motivation.

"One more time: What exactly is Leadership? …. And, does it really matter?"

Talk about leadership is everywhere. Everyone, it seems, has written a book about leadership – or done a podcast or a Ted-talk. Managers get sent off to leadership training all the time. What do we know about it? This talk is about my observations about leadership, from childhood to a career of studying and writing about leadership. It is about history, it is about fantasy, about fact and fiction but most of all it is about storytelling and about sensemaking. I will attempt to persuade you that leadership in organizations is about two very different sets of behaviors – we will call them strategic and relational. Both are generally called leadership although they require very different skills, and are required of different people in the organization.

Helena Paradell

Helena Paradell earned her degree in Veterinary Medicine from the Autonomous University of Barcelona, Spain and her Master in Pig Production from the University of Aberdeen (Scotland).

She is the Animal Welfare Director of Zoetis Manufacturing & Research Spain, S.L., with the responsibilities of Designated Veterinarian, member of the Ethics Committee, head of the Animal Welfare Service and the management of the animal facilities.

With 24 years of experience working with animals for research, Helena is a specialist in the management of animal care and use programs in a wide variety of species (from rodents to agricultural animals) in biosafety facilities under GxP standards.

She is a member of the AAALAC International Council on Accreditation.

"THE IMPORTANCE OF EFFECTIVE INTERNAL COMMUNICATION: AAALAC TYPICAL FINDINGS AND EXPECTATIONS"

Helena Paradell, Zoetis Manufacturing & Research, Spain

The AAALAC International Council on Accreditation evaluates the quality and implementation of all elements of an animal care and use program. Once the key roles and responsibilities have been well defined (ref.: previous presentation), effective communication between the different key players with responsibilities in the program is essential to achieve successful implementation of the animal program. For example, the Institutional Official (IO) must be timely informed of the status (strengths and needs) of the program, and of all significant incidents, to ensure implementation of corrective actions as deemed appropriate. Effective communication between animal care staff and technicians with the Designated/ Attending Veterinarian is needed to ensure timely provision of veterinary care when needed. Also, the Oversight Body must have fluid communication, in addition to the IO, with the veterinary, animal care and research teams to identify areas where its input can improve animal welfare. Findings identified during the evaluation site visits are categorized in Mandatory Findings (must be corrected to obtain Full Accreditation) and Suggestions for Improvement (in the opinion of the Council "should" be corrected, on a voluntary basis). AAALAC International routinely collects and analyzes the information coming from the evaluation site visits. In this presentation, the most typical findings on this area identified during site visits performed by the European Section of the Council on Accreditation in Europe, Africa and the Middle East between years 2021 and 2024 will be discussed, along with the AAALAC´s expectations for the particular aspects concerning internal communication between the animal program key players.

ORAL ABSTRACTS

VETERINAY CARE

CARE - DIGITALIZATION OF VETERINARY CARE

Søren Søgaard, Marianne Ravn Møller

Gubra

Working with a variety of animal models in preclinical metabolic disease research and drug discovery, we sought to implement a continuous loop of animal monitoring and rapid veterinary care to ensure the wellbeing of the animals. To do this, we developed our own platform 'Care'.

Together with our internal software solutions team, we have developed a weight monitoring system for the animals in which real-time data is uploaded directly to our internal Data Explorer and Care application. Both study directors and veterinarians consider Care as an excellent tool for monitoring the animals and ensure that animals without clinical or external signs of disease will be assessed on objective parameters daily.

Our animal care consists of a cooperation between study directors, animal technicians and veterinarians to ensure an efficient daily monitoring of the animals. The monitoring consists of both objective parameters (e.g., body weight or food intake), as well as clinical parameters consisting of daily visual inspections by the animal caretakers and veterinarians.

Animal caretakers examine for a variety of parameters when handling the animals. If veterinary attention is requested, the observations are passed through to the Care application and the attending veterinarian will then attend the animal facility immediately for an evaluation. The Care application draws on a variety of available in-house data to help the veterinarian in their health evaluation of the animal. Animals being evaluated will be presented with study specific details, animal logs, body weight curves, etc. to help assure animals receive the proper care they need.

JUST GETTING A NUMBER DOESN'T MEAN IT'S RIGHT: QUALITY CONTROL APPROACHES FOR CLINICAL PATHOLOGY IN A LABORATORY ANIMAL CORE FACILITY

Ingrid Bergin, Anna C. Colvig, Florin C. Timpau

University of Michigan, Ann Arbor, Michigan, U.S.A.

Quality control and quality assurance guidelines are well-established and heavily regulated for human clinical laboratories and for Good Laboratory Practice (GLP)-certified preclinical laboratories. In contrast, quality control and quality assurance practices for veterinary clinical laboratories are far less standardized. We operate a laboratory animal pathology core facility within a large AAALAC-accredited academic biomedical research center. We generate animal hematology and clinical chemistry data as diagnostic support for our veterinary care team and as a recharge service for investigators. Accuracy and reproducibility of our results are critical to support diagnostic decision-making and to ensure quality research data. This presentation will review the measures we have taken to control analytical and pre-analytical variables and to implement quality control and quality assurance practices in our laboratory. Recently updated quality assurance recommendations of the American Society of Veterinary Clinical Pathology for non-GLP veterinary clinical laboratories will be discussed. Specific examples of how we have implemented these guidelines and examples of the impact of quality control on diagnostic or research outcomes will be included. A suggested approach to quality control that is suitable even for small (single instrument) laboratory animal diagnostic settings will be provided.

CAMELID HEALTH MONITORING USING A MOBILE APPLICATION, DATA VISUALIZATION AND ANALYTICS SOFTWARE

Vicky Deblock[1], Edith Stuyven[1], Mirjan Thys[1], Marc Geldhof[1], Céline Ostijn[2]

[1] Sanofi Ghent
[2] Cegeka

This abstract introduces an innovative animal health monitoring application specifically designed for camelids used in biomedical research and development. The conventional process of monitoring animal health has been associated with substantial data generation. Formerly reliant on manual record-keeping within stable environments, the workflow involved transcription into notebooks and Excel-based tables, resulting in extensive administrative burdens for animal caretakers and veterinarians. This approach also posed challenges in sharing data among multiple veterinarians and tracking long-term issues. Moreover, there was a need for enhanced data visualization and interconnectivity.

Addressing the lack of suitable health monitoring tools for large research animals, the Camelid Health Check application (CHC) was developed in-house. This mobile application allows offline data recording using a tablet in the field and facilitates the creation of real-time health monitoring reports. Upon synchronization, these reports are integrated into a centralized database and made accessible to the multidisciplinary team through a web-based application. Furthermore, a data visualization tool allows the linkage and visualization of data, enabling comprehensive analysis of large datasets and the generation of insightful monitoring reports.

This application significantly streamlines the administrative processes, enhances data quality and accessibility, and facilitates collaborative decision-making among veterinary professionals which results in optimal animal welfare standards.

THE KEY ROLE OF THE DESIGNATED VETERINARIAN ON PROMOTING CULTURE OF CARE: SUCCESSFUL INITIATIVES & CHALLENGES

Jordi L.Tremoleda[1], Angela Kerton[2], Aisha Nihas[1], Beth Greenhough[3]

[1] Queen Mary University London
[2] The Learning Curve (Development) Ltd., UK
[3] University of Oxford, UK

With the increasing regulatory and societal expectations to deliver new and better treatments, animal research remains a complex professional environment. The pressure to success combined with provision of best caring duties, is becoming increasingly challenging, driving elevated expectations on emotional resilience which sadly, may lead to compassion fatigue and caring dissonance attitudes. Despite the positive increasing awareness on caring culture, changing working attitudes, particularly when linked to emotional perspectives remains slow. On this, the designated veterinarian plays a key strategic communicator role supporting welfare practices across all stakeholders. Hereby, we will reflect on the veterinarian lead to support innovative approaches to promote emotional openness around caring challenges responsibilities. We will feedback on the development of a storytelling based-tool (https://www.geog.ox.ac.uk/research/technological-life/projects/care-full-stories/index.html) to facilitate openness among our multidisciplinary teams; and the setting up of institutional awareness platform to promote engagement across all staff involved with animal research. We will reflect on the input of the designated veterinarian, bridging on the communication between researchers, animal technologist and institutional staff to facilitate openness and to promote equitable professional responsibilities across such multidisciplinary research teams. We will discuss the successes and challenges of such initiatives, addressing pressures and expectations, multicultural diversity, mid-long term impact and importantly, why forthcoming emotional and personal perspectives must be considered in our professions. Training initiatives must thrive on engagement, interpersonal connections, and the acknowledgment of professional emotional openness. The designated vet must continue to be a major lead on these.

ORAL PRESENTATIONS

ANIMAL WELFARE

LOOKING INTO THE FUTURE: AUTOMATING PARTURITION DETECTION IN THE HOME CAGE

Sara Capas-Peneda[1], Isabel Ferreira[2], Colin Gilbert[3], Jan-Bas Prins[4], Ashley Vanderplank[5], Giorgio Rosati[6], Marco Garzola[6], Anna Olsson[2], Gabriela Morello[2]

[1] i3S – Instituto de Investigação e Inovação em Saúde da Universidade do Porto, Porto, Portugal; ICBAS School of Medicine and Biomedical Sciences, Universidade do Porto, Porto, Portugal
[2] i3S – Instituto de Investigação e Inovação em Saúde da Universidade do Porto, Porto, Portugal
[3] Babraham Institute, Cambridge, UK
[4] Leiden University Medical Centre, Leiden, Netherlands (at the Francis Crick at the time of the experiment)
[5] Francis Crick Institute, London, UK
[6] Tecniplast SpA, Buguggiate, Italy

Breeding management in laboratory rodents is challenging. Inspection of breeding cages during the neonatal period is often avoided due to fear of increasing pup mortality. Moreover, cage side observations can lead to underestimation of the number of pups born and are labour intensive: single daily checks can provide unreliable birth records and increased risk of missing birthing complications. Home Cage Monitoring (HCM) technologies have been gaining traction in animal facilities, offering measurements of food and water availability, activity levels, and events such as cage floods. Parturition is a suitable candidate for HCM detection, with potential indicators including changes in activity, parturition-related behaviors, and vocalisations.

In this study, video and audio data were collected from 30 parturitions of C57BL/6J females, either single housed or as breeding pairs, in a prototype DVC rack with integrated microphones and cameras. Audio recordings were analysed by a semi-automatic system. A tailored neural network was constructed on DeepSqueak using files containing background noise and calls present during parturition.

Before parturition, vocalisations were negligible, except for ultrasonic vocalisations in pair-housed mice. During parturition, vocalisations in the human audible range were detected in both single and pair-housed mice. Post-parturition, all vocalisations decreased over time in a negative exponential fashion.

The results suggest that detecting audible vocalisations in HCM systems can be used for automated parturition detection, with potential to enhance breeding management practices and improve the welfare of breeding colonies. Further ongoing research involving different strains and more complex social environments could improve the scope of these findings.

THE USE OF HOME CAGE ANALYZER TECHNOLOGIES TO STUDY SEX EFFECTS ON LABORATORY MOUSE BEHAVIOUR

Juan Pablo Morales Florez, Sophia Enggaard Hansen, Zofia Sus, Simon Mc Arthur, Jordi Tremoleda

Queen Mary University of London

Within preclinical research, there is a persistent sex bias where studies are predominately conducted in male animals. This remains critical for neuroscience studies, where functional outcomes are generally referred to male acquired baselines. Hereby, we will discuss our studies utilizing a home cage automatic activity monitoring system (HCA system; ActualHCA™) to gain insights into spontaneous and social behaviour in male and female mice. Our results, acquired via automatic tracking and video recordings reveal some sex specific behaviour changes depending on the time of day and environmental enrichment used in CD1 mice. Behaviour patterns were compared to acquired behavior in male and female Mus pahari mice, a wild mouse strain genetically distinct from the standard Mus musculus, which displayed a more preserved and consistent circadian rhythm. Furthermore, we investigated the impact of repetitive volatile anaesthesia on male and female CD1 mouse behaviour which showed a male specific response on general activity, along with higher aggression and grooming activity. HCA technologies provide a comprehensive platform for assessing non-stimulated mouse behaviour, bringing new light onto sex effects and better context into the baseline behavior of commonly used mouse strains. However, important considerations regarding systems capabilities to detect specific behaviour patterns, automatic data analysis, data sharing and storage remain to be addressed in future technological developments. Automatic data acquisition needs to be supported with advanced AI technologies, and it is important that such developments are made available to the broader community to enable resource sharing and to model expertise to promote best 3Rs practices.

NUMBERS DO MATTER – ADDRESSING SEX BIAS AND ANIMAL WASTE IN RESEARCH SETTINGS

Patricia Turner[1], Wairimu Gatome[2], Elizabeth A. Nunamaker[3]

[1] Charles River
[2] Charles River, Margate, UK
[3] Charles River, Wilmington, MA, USA

An estimated surplus of 12.5 million research mice and rats are produced annually in the EU and there is significant interest within the laboratory animal community and amongst regulatory oversight bodies to reduce surplus animals produced for research. However, while institutional Animal Ethics Committees commonly focus on internal actions and activities related to animal replacement, reduction, and refinement, there is little focus on how common research practices and experimental designs, including the use of a single sex of animals in experiments, may contribute to animal over production and waste over the course of a year. For animal suppliers, internal data indicates strong sex by strain biases by species, for example, with 50:50 male (M) to female (F) use of Wistar Han rats vs 30:70 F:M use of CD rats. Surplus numbers are further strongly influenced by popularity of certain stock or strains, such that overall for rats, female rat use is only 56% that of males. Conversely, amongst genetically modified mice (GMM), there is a strong bias towards using females, with overall use of male GMM being only 19% of female littermates. Wild type offspring in GMM litters are often culled at weaning despite that they represent the best negative controls for a given GMM colony. In addition to contributing to animal waste, sex bias in research skews results, which may bring into question the quality of research data, including reproducibility. Sex bias and other factors contributing to animal waste will be discussed in this session.

ENVIRONMENTAL FACTORS INFLUENCE BEHAVIOUR AND PHYSIOLOGY IN RATS

Logan J. Bigelow, Emily K. Pope, Paul B. Bernard

University of Prince Edward Island

Rodents are commonly used as human and animal substitutes. Although there is great ethical concern over the use of rodents, their contribution to the alleviation of suffering of more sentient creatures has permitted their continued use. However, the recognized inability to replicate experimental findings places researchers at an ethical crossroads that must be addressed. Over the past couple of decades there has been much concern over the control of environmental variables in rodent research. Besides the obvious welfare implications, there is concern that environmental variables may be a contributor to the replicability crisis. As a means of better understanding the contribution of environmental variables to experimental outcomes, the impact of animal handling protocols, different housing scenarios, and extraneous ultrasound on welfare outcomes in rats was explored. Measures included both classic assessments of anxiety-like behavior such as the open field, elevated-plus maze, and light-dark box, in addition to ultrasonic vocalizations and corticosterone. Both behavioral and physiological markers were affected by alterations in animal handling, housing conditions, and noise, suggesting that environmental variables do significantly impact measures of affect, and thereby must be considered in study design and post-study reporting. Further studies will be essential in examining the impact of these measures in the face of an experimental intervention.

IMPROVEMENT OF A DOG HOUSING AND ENRICHMENT PROGRAM

Anthony Piccarreta, Héloïse Vollmer

CRL Safety Assessment Lyon France

According to the Guide, dogs should have adequate bedding substrate, resting area and chewing opportunities to encourage natural behavior and improve their welfare. Dogs should also be removed from the home pen to a separate area and allowed to exercise with other dogs.

Since the last AAALAC visit in 2022, significant improvements of the dog program have been made at CRL Safety Assessment Lyon France, a facility specialized in safety evaluation of drug candidates, with the following goals : improving housing conditions, enhancing the variety and quantity of toys in the home pens, offering a better experience when dogs are exercised outside their home pens, and finally, to embellish the dog unit.

Dogs are now housed permanently on wood shaving bedding, which provides a comfortable and clean resting area. The shape and height of the food hoppers were redesigned to make access to food easier for dogs that may have reduced appetite in the context of toxicology studies. In addition to a different toy being proposed daily, a hanging toy is also provided in the home pens and changed weekly. Moreover, in the exercise area, dogs have access to a range of toys and to exercise modules.

Lastly, the pen walls, originally beige in color, were replaced with orange, blue or pink walls : whilst the dogs may not perceive these changes, this provides a colorful atmosphere which has had a positive effect on staff. Altogether, these improvements have enhanced both dog and animal staff wellbeing at our facility.

TRAINING NON-HUMAN PRIMATES FROM BREEDER TO USER: A GLOBAL BENEFIT

Helen Beyer, Ruta Vaicekauskaite

Silabe - University of Strasbourg

The use of non-human primates for scientific purposes is strongly regulated by Directive 2010/63/EU. Individuals from all species of non-human primates have to been bred for use in procedures. Researchers therefore rely on official breeders and suppliers authorized by competent authorities. Because of their much longer development and lifespan compared to other species bred for use in procedures, the preparation time of non-human primates until its first use could last several years. The aim of this presentation is to highlight the important role of breeders and suppliers during the preparation of non-human primates. For the user, accessibility and compatibility of the animals, depending on the future procedures and housing conditions, may be of importance as great as health and sanitary aspects. We will present several tools to assess and improve these specifications. For instance, positive reinforcement training (PRT) is a technique used to encourage voluntarily cooperation of animals thanks to rewarding stimulus. Despite its high time-demand process, training non-human primates can have significant benefits for animal welfare, research and staff, and may be part of the preparation period.

Thanks to several case-studies, we want to show how breeders, suppliers and users can collaborate in a win-win-win process, for the provider, the researcher, and the animal.

EMERGENCY PLANNING WHEN WORKING IN-VIVO: DISASTER PLAN VS. BUSINESS CONTINUITY MANAGEMENT PLAN

Eva Maria Amen

F. Hoffmann-La Roche Ltd.

Animal facilities may be subject to unplanned events that could place the health and wellbeing of the facility's staff and animals at risk, disrupt operations, and threaten the organisation's financial standing or public image. Therefore it is a must for AAALACi-accredited facilities to have a disaster plan in place.

A state-of-the-art Disaster Plan ensures the protection of critical components, e.g. Safety, Health and Environmental Protection, Animal Welfare, and Business Continuity.

A Disaster plan typically addresses distinct hazards, and gives details for mitigation, preparedness, response, and recovery after any of these. The plan defines who is in charge, when the plan will be activated, and what actions will be taken in which way.

Apart from preparedness for disasters, a plan for Business Continuity Management (BCM) is recommended, which ensures the capability of the organisation to continue the delivery of key products and services at a minimum, acceptable level following a disruptive incident.

Key aspects include a thorough risk assessment and review of business critical activities against defined losses, where serious risks could impact the delivery of key products and services. Dedicated tables detail timelines for Incident Management and for BCM strategies describing short and long term solutions used in recovering critical activities.

Both in exercises and in real life events Disaster plan and BCM plan go hand in hand, and preparedness, communication, and teamwork will help in mastering any crisis. Taken together, good preparation and practice help in mastering even unpredicted events.

TUNNEL-HANDLING IN A MOUSE BREEDING FACILITY: TIMECOSTS AND BEHAVIORAL RESPONSES OF DIFFERENT STRAINS

Kristina Ullmann

Nuvisan ICB GmbH

Catching and lifting the mice by the tail has been a standard method for decades. However, tail-handling was shown to cause anxiety and stress when compared to alternative methods like the use of a tunnel. Since tunnel-handling is considered to be non-aversive and to influence animal welfare positively, it has become more common recently.

The introduction of tunnel-handling during breeding and husbandry of mice was piloted in a central breeding unit. The cages were permanently equipped with a transparent plastic tunnel that was used to transfer the animals weekly. The tunnel-method was compared to tail restraint on 150 weanlings from three mouse strains (WNK (WNK1+/-), NZW (NZWLac/J RRID:IMSR_JAX:001058) and HelloKitty (C57BL6-Cpa-Cre;Mcl-1fl/fl)) over 9 weeks in routine husbandry. The caretakers recorded duration of each transfer and behavior of the animals before, during and after capture.

The time required to transfer a mouse into the fresh cage using a tunnel was increased by approximately 3 seconds compared to fixation at the tail base.

Depending on the technique, time and genetic strain the mice showed different responses in terms of stress-related and exploratory behavior, i.e. defecation during and after capture, residence in the shelter, exploration of the homecage, voluntary contact to the caretaker's hand. NZW mice benefited the most. Details have been published recently https://doi.org/10.1177/00236772231215077.

When implementing non-aversive techniques, the needs of animal husbandry management, scientists and staff concerns have to be considered. Standard protocols should be evaluated and responses of different genetic mice strains must be further investigated.

ORAL PRESENTATIONS

FACILITY MANAGEMENT

BIG DATA AND HOW TO LOVE IT

Alice McNamara

Labcorp

In the era of information explosion, establishments dealing with laboratory animals can generate vast datasets. This talk delves into the challenges and opportunities presented by big data in lab animal science. Attendees will gain insights into how Labcorp has leveraged data analytics to enhance research outcomes, streamline clinical practices, and improve overall animal welfare.

The presentation will address the unique aspects of handling large datasets in a laboratory animal context, considering factors such as ethical considerations, data privacy, and the balance between quantity and quality of data. Practical examples will illustrate how big data analytics can be applied to identify patterns and optimize protocols in laboratory animals.

Furthermore, the talk will emphasize the importance of cultivating a positive attitude towards big data, encouraging lab animal vets to embrace the technological advancements that can revolutionize their field. Strategies for developing data-driven decision-making skills and integrating data analytics into daily laboratory practices will be discussed, fostering a culture where data is seen as an asset rather than a mysterious black box.

Ultimately, this presentation aims to share personal experiences working with big data and lessons learned from that to hopefully inspire further applications.

ESTABLISHING AN EFFECTIVE UNIVERSITY SYSTEM-WIDE INCIDENT REPORTING PROGRAM

Stacy Pritt

Texas A&M University System

University systems are groups of institutions of higher education that maintain an affiliation and shared governance, while operating separately at different locations. Such university systems are present throughout the world and may incorporate more than 20 members.

Depending on a system's leadership, mandates, risk tolerance, and infrastructure, component institutions may be required to report notable incidents that may adversely impact them or their system. Incidences involving research animals may be included in this type of reporting due to the potential for negative publicity and reputational harm.

To effectively manage the reporting of incidents involving research animals, especially among multiple institutions with diverse research goals, funding, and animal populations, building a broad-based program with clearly developed guidelines is essential. This session will explore how the Texas AM University System, a system comprised of 11 educational institutions and 8 state agencies, has implemented an incident reporting program by defining what needs to be reported, how, and when, based on the unique aspects of its member organizations. Furthermore, this session will examine how expert guidance at the system level can promote effective reporting, incident management, and resolution. Finally, the ability to leverage current technology to streamline reporting, incident evaluation, communications, and utilization of metrics will be discussed.

IMPLEMENTATION OF AN ANIMAL-FREE HEALTH MONITORING (HM) PROGRAM IN A LARGE ACADEMIC INSTITUTION. KEY DECISIONS, CHALLENGES, AND OPPORTUNITIES.

Celdran-Bonafonte D, O'Connell K, Wagner AM, Tucker HR, Doane CJ, Besselsen DG

University Animal Care Department. The University of Arizona

The use of live sentinel rodents to monitor colony health has been a reliable industry-standard approach for decades. Motivated by efforts to reduce and replace animal use, and enabled by technological advances, this live sentinel rodent HM is progressively being replaced by PCR-based methods that avoid the use of animals and improve pathogen surveillance. The decision to implement such an important change in a laboratory animal care program can be a daunting challenge. It requires walking a path full of key decisions with significant programmatic impact. Some of these decisions involve answering complex technical questions such as sampling procedure, test frequency, pathogen-specific test validation, and pragmatic implementation. The evolution of diagnostic test options in the market and the absence of a singular industry standard used by all animal care programs creates numerous questions throughout the decision-making process. The individual and cumulative effect of each choice must always be balanced against the overall risk assessment and economic repercussions for the program. This presentation summarizes the transition process of an animal-free HM program within a large academic animal care program, and elaborates on the internal and external conditions that guided the most crucial decisions through the implementation process.

WHAT HAPPENS WHEN MOUSE GENETICS IS OVERLOOKED: IS IT POSSIBLE TO FIX A GENETIC CHAOS?

Viola Galligioni

Netherlands Institute for Neuroscience, Royal Netherlands Academy of Arts and Science, the Netherlands

Exchange of genetically complex mice strains between research institutions has become common practice, but strain-related information is not always available.

In a facility where breeding strategy is left to researchers, important information such as breeding generations, technology to generate the mutation, backcrossing, and genetic monitoring could be left out from the picture. Often mice strains are recorded only with the name of the mutated gene, without further information. Therefore, genetic quality and stability of the strains are overlooked. We will provide some examples on how mutated mice strains were phenotypically and genetically drifting and the plan put in place to monitor the strains and to rescue (if needed) the original genetics.

With researchers still fully in charge of the breeding strategy, the plan included:
- education and training activities for both research and facility staff on importance of correct genetics information;
- rearrangement of strain import form to capture all necessary genetic information;
- involvement of breeding facility staff in the breeding strategy;
- genetic (SNPs) monitoring control of all new strains at the time of import into the facility;
- set up of genetic (SNPs) monitoring control program for the existing 65 strains;
- use of genome sequencing analysis in case of problems;
- financial involvement of the facility.

The examples provided will show positive outcomes and limitations of setting up a genetic monitoring program in a facility in which many strains were previously generated by researchers themselves.

SWC SITE VISIT: HOW DID WE GET THERE?

Eleni Amaniti[1], Sian Murphy[1], Jamie Redden[2], Tom Otis[1]

[1] Sainsbury Wellcome Centre, UK
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In 2022, the Sainsbury Wellcome Centre (SWC) went through the AAALAC accreditation process for the first time. In preparation for collating the programme description (PD), the Neurobiological Research Facility (NRF) management team reviewed all the related departmental processes.

The aim was not only to provide an accurate PD but also to refine our standards. To achieve this, firstly we chose only two members of the NRF team to orchestrate all the NRF's and SWC's actions leading to the site visit. This ensured a centralised yet bi-directional flow of filtered information and data. Secondly, we reviewed the workload of our animal technicians' team very early in the process. The review pointed towards implementable workload refinements - unique to SWC based on its structure and NRF service expectations - that allowed the technicians' team to actively participate in the accreditation process. By doing so, achieving the SWC AAALAC accreditation became a goal for the entire NRF team rather than for SWC administrative staff or managers, alone.

Overall, SWC's participation in the AAALAC accreditation process contributed to an improvement of our standards as well as strengthened the interaction and coordination between the NRF team and other key SWC departments like the Building Operations' team. The site visit confirmed that our PD conforms with AAALAC International standards. The outcome was the greatest reward for the entire SWC and especially the NRF team.

CHARACTERIZATION OF OCCUPATIONAL MURINE ALLERGENS IN STANFORD RESEARCH FACILITIES

Stephen Felt, Katrina Shao, Susan Vleck PhD, David Bentzel Jr. VMD, MPH, DACLAM, DACVPM

Stanford University

Introduction: The most common animal species associated with Laboratory Animal Allergies (LAA) is mice due to their widespread usage and higher urine protein content compared to other mammals. The primary mouse allergen that causes human allergic sensitization and allergic respiratory disease is Mus m 1- a lipocalin produced in liver cells. Mus m 1 is primarily found in and excreted through urine and deposited in the mouse's surroundings. As excreted Mus m 1 protein dry, they become airborne through dust particles.

Aim: 1) To measure the amount of dust particulates from personal samples and determine the amount of allergen proteins in each sample to see if there is a correlation between dust particulate levels and allergen protein levels to determine if dust particulate levels serve as a surrogate for allergen protein exposure.2) To examine how dust particulate and allergen protein levels vary with different types of animal work at Stanford to allow for the performance of a detailed risk assessments for personnel working inside laboratory animal facilities.3) To determine roughly how far away dust particulates/ allergens settle from generation point to help prevent LAA symptoms in individuals working in shared laboratory space where animal work is performed.

Materials/Methods: During various work tasks (e.g. cage changing, animal handling), personal and stationary air monitoring samples were taken using 3 three Airchek Pump w/ cassette filters (2 within breathing zone and 1 at a stationary distance). DustTrak aerosol monitor tracked real-time dust measurements to validate cassette dust measurements.

Results: Analyzing Data

ORAL PRESENTATIONS

LEADERSHIP AND COMMUNICATION

PROMOTING CONTINUOUS INCREMENTAL IMPROVEMENTS TO ADVANCE INSTITUTIONAL CULTURE OF CARE

Patricia Turner[1], Judy Murray[1], Jukka Puoliväli[2], Carly O'Malley[1]

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Establishing a Culture of Care in research settings describes developing an organizational culture that provides support to strive for continuous improvement in animal care and welfare, ensure care and support for those caring for and working with animals, ensure that work is conducted to emphasize scientific quality and integrity, and develop communications that promote internal transparency as well as external openness. While these are aspirational and lofty goals, it can be difficult to know where to start and whether programs are impactful. Benchmarking institutional Culture of Care through employee surveys can be helpful for establishing a baseline as well as assisting with subsequent prioritization of suggested actions and activities. The results of the survey also can be used to initiate discussions, awareness, and support about and for institutional Culture of Care and related initiatives with multiple individuals and groups, including vivarium personnel and veterinary professionals, animal ethics committees, researchers, human resources, and senior administration. These discussions can also help to develop a prioritized list of long and short term goals with associated action plans. When possible, plans should include a mix of easy and more challenging targets to ensure early wins for the program. When seeking to advance a Culture of Care program, supporting a process of continuous incremental change with regular check-ins can be a highly successful approach for making and solidifying significant improvements over time. This session will focus on using metrics, incremental improvements, and a quality assessment process to advance institutional Culture of Care.

ADDRESSING COMPASSION FATIGUE AND CULLING RELATED EMOTIONAL DISTRESS IN LABORATORY ANIMAL CARE: A WORKFLOW APPROACH

Sammy Blok, Kelly Spanou, Anne Brom, Rainier Epping, Viola Galligioni

Netherlands Institute for Neuroscience, Royal Netherlands Academy of Arts and Sciences, Amsterdam, Netherlands

Compassion fatigue (CF) is the physiological, affective, and cognitive exhaustion that is associated with laboratory animal care. Compared to its human counterpart , CF exhibits a higher prevalence among laboratory animal workers. However, stigma hinders open communication and effective management of this form of emotional burnout. At the Netherlands Institute for Neuroscience, several measures are implemented to address CF amongst caretakers.

Managing culling-related emotional distress in laboratory animal research is a significant challenge. Despite various methods to alleviate animal suffering, inherent human distress persists. Consequently, efforts are directed towards making this emotional burden more manageable.

In our breeding facility, we have implemented a workflow aimed at mitigating the emotional impact of animal euthanasia by limiting culling during the pre-weaning phase. In the Netherlands, distal phalanx amputation for identification and genotyping within postnatal days 5-7 is permitted, and this method has been utilized in our institute for the past 5 years. While debated in many countries, this approach allows researchers to gather crucial data before weaning, thus preventing the buildup of a large euthanasia count. Caretakers therefore, know in advance the approximate culling number per litter, and they can evenly distribute the task throughout the week to avoid a single day of heavy emotional burden.

This workflow was praised amongst caretakers, with many expressing relief at avoiding simultaneous euthanasia and weaning, on the same day, as both of these procedures induce stress. Additionally, sacrificing early postnatal pups was deemed more tolerable due to uncertainty regarding the onset of pain perception.

COMMUNICATION AND TRANSPARENCY IN RESEARCH INVOLVING ANIMALS: IMPORTANCE AND IMPACTS

Pascal Ance

SILABE - UNIVERSITE STRASBOURG

Research involving animals plays a crucial role in scientific progress, whether it's fundamental, biomedical, or behavioral research. However, this practice raises important ethical and moral questions, requiring transparent communication to ensure legitimacy and public trust. This presentation explores the importance of communication and transparency in animal research, through examples and practices implemented within SILABE, thus highlighting the impacts of this communication within civil society, policies, and media.

Effective communication among researchers, institutions, and the public is essential to inform stakeholders about the objectives, methods, and results of research involving animals. Transparency in communication helps to ensure scientific integrity, address ethical concerns, and foster public trust in scientific research.

Furthermore, open communication about practices and results of animal research can have significant impacts on legislation and policies governing the use of animals in laboratories. By providing the public with accurate and up-to-date information on research practices, policies can be developed in a more informed and ethical manner, ensuring adequate protection of animals while promoting responsible scientific research.

SILABE, a signatory of the Transparency Charter on the use of animals for scientific purposes, is consistently targeted by animal protection associations and faces criticism for its opacity in communication, even as it increases actions and efforts to communicate and be transparent about its activities. Through this testimony, we will provide an overview of the communication actions implemented and attempt to evaluate their impact on the general public and the media.

EMPOWERMENT OF ANIMAL FACILITY STAFF TO IMPROVE STAFF AND ANIMAL WELFARE

Viola Galligioni[1], Ngaire Dennison[2]

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Animal care staff (care-takers, technicians) working in animal facilities are the eyes and ears of animal welfare officers and veterinarians. Their role goes beyond feeding, changing cages, breeding or performing basic procedures. They are the first to see changes in animal welfare and can provide critical inputs for refinement of procedures, based on their experience and knowledge of the locally available systems and equipment.

However, to be motivated in contributing to these aspects, animal care staff (ACS) need to be encouraged and supported by management and veterinarians.

Here, we provide examples of programs designed to empower ACS, which benefitted animals, scientists and facility management:
- Training in study-specific technical aspects: including refresh/review of technical procedures, learning new techniques (e.g. necropsy in neonates) and review of breeding strategies. Where possible, training from an outside veterinarian or expert can provide another perspective.
- Seminars for ACS in which users (PhD students, postdocs, lab technicians) explain the use of animals in their research and the reasons behind specific procedures.
- Involvement in writing abstracts for scientific conferences/symposia, to improve their knowledge of scientific language.
- Presentation of posters or talks at scientific events for recognition of the impact ACS can have on animal welfare and the science.

For success, the program needs to be financially sustainable and supported by higher management, but even small actions can help ACS to be more confident in their expertise and, therefore empower them to communicate better with researchers to improve animal welfare.

THERE IS ONLY ONE WELFARE!

Kévin P. Dhondt

Charles River Laboratories - RMS France

While our institutions are facing increasing and legitimate demand of Culture of Care standards from citizens, collaborators and, eventually, customers, it is crucial to ensure that the welfare of our animals does not overwrite the well-being of those who take care of them. The One Welfare approach is then essential for balancing the needs of animals, humans, and the environment. This approach emphasizes the importance of considering all aspects of welfare when making decisions that impact the lives of animals, the people who care for them and their environment. Ultimately, prioritizing One Welfare ensures a more holistic and compassionate approach to animal care and management.

This presentation will show through concrete examples, how, by adopting a One Welfare approach, we can address the complex interactions between animals, humans, and the environment, and strive for solutions that benefit all parties involved. By prioritizing the interconnectedness of these elements, we can work towards creating a more harmonious and sustainable relationship between humans and animals. This sustainable perspective that navigates through the concepts of 3R, Culture of Care, openness, compassion fatigue and resiliency building, encourages us to consider not only the immediate needs of animals, but also the long-term implications of our actions on their welfare and the overall mental and physical health of the full animal research ecosystem.

POSTER PRESENTATIONS

TO BREED OR NOT TO BREED?

Eva Maria Amen

F. Hoffmann-La Roche Ltd

The number and variety of genetically modified animals used in biomedical research is continuously increasing. When dealing with genetic modifications of varying complexity, breeding activities require considerable amounts of resources and special expertise, and some institutions may have to carefully evaluate if these efforts can and should be done in-house.

The outsourcing of breeding activities represents an attractive combination of harnessing the vast expertise of professional breeder organizations corroborated with reducing the need for physical space, manpower, and other resources in-house.

Certain challenges must be met to facilitate a smooth process for providing research groups with their required rodent lines despite added complexity of logistics and involvement of further stakeholders. Establishing a team either as coordinators, or as the Single point of contact (SPOC) between the breeders and the users of rodent lines can be a strategy to overcome this challenge. To function in an efficient way, this team must combine subject matter expertise, a structured approach, and distinct communication skills, to liaise with a large spectrum of stakeholders.

Regardless if the team works as SPOC or rather serves as a coordinating function, crucial points include standardized workflows on establishing new lines in breeding, clear roles and responsibilities for everyone involved, and sensitizing mindsets towards early and precise planning by providing detailed and accurate information.

Key success factors for this include harmonized exchange with breeders and researchers, and the definition and alignment of standards for legal and financial aspects, hygiene levels, de-risking strategies, and quality controls, and efficient IT tools.

IN VIVO AND IN VITRO STERILITY ASSESSMENT OF BLACK PRM1-EGFP MALE MICE – PINK IS THE NEW BLACK

Camilla Aniballi[1], Sara Fuochi[1], Jorum Kirundi[1], Carlotta Detotto[1], Hewapathiranage Dhanushka Sayani Hewapathirana[2], Christine Göpfert[2], Alessandra Bergadano[1]

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Sterile males, yet capable of copulation, are used for assisted reproductive techniques. In 2010, Hauetercolleagues described a transgenic mouse line showing dominant male-sterility due to overexpression of Prm1-EGFP fusion protein linked to “mCherry” skin phenotypic transgene marker (CAG-mRFP1). This Reporter is a refinement to avoid genotyping. Mice are phenotypically agouti (agouti-mCherry+: sterile males) or albino (albino-TyrC+: fertile males).In the colony at EAC, we occasionally obtain black coated males with cherry skin (black-mCherry+: fertility unknown). This event is consistent with the strain having more than two progenitors, CD1 and (C57BL/6xDBA)F1. To promote Reduction, we hypothesised that also black-mCherry+ males are sterile. Three Prm1-EGFP males of each phenotype were tested for fertility, in vivo and post-mortem, by sperm morpho-functional parameters and gonad histology. Lastly, mCherry+ were genotyped to confirm consistency between genotype and phenotype. Agouti-mCherry+ and black-mCherry+ males proved sterile in vivo. However, even though the black mCherry+ mice tested were qualitatively positive for Prm1-EGFP and CAG-mRFP1, the morpho-functional analysis showed a higher percentage of normal (25%) and motile spermatozoa (14%), but still classified as non-functional (12%), with a residual functional spermatozoa of 2%.Looking at the results, the authors support the use of black mCherry+ males as sterile studs. Yet, maintaining the proven sterile studs (agouti-mCherry+ and black-mCherry+) with a fertile female is an effective quality control to prove the long-term sterility of these subjects – and a Refinement allowing both to fully use all the phenotypes and avoid single housing.

Thanks to Pawel Pelczar, UniBasel, for colony management tipstricks.

RETROSPECTIVE COMPARATIVE STUDY BETWEEN A NEW REMIFENTANIL-PROPOFOL AND FENTANYL-PROPOFOL TOTAL INTRAVENOUS ANESTHESIA (TIVA) FOR NEUROSURGERY IN MACAQUES

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Remifentanil based anesthesia is routinely performed in human neurosurgery. In contrast, its use in non-human primates (NHP) is not described. Here we address this gap by developing a new remifentanil-propofol anesthesia for macaque neurosurgery, and comparing retrospectively to traditional fentanyl-propofol anesthesia. Twelve anesthetics were performed (F=6; R=6). After premedication, anesthesia was induced with 3 mcg/kg fentanyl (F) or 3 mcg/kg remifentanil (R) intravenously (IV) and maintained through propofol and fentanyl or remifentanil constant-rate-infusion (CRI), respectively. Tracheal intubation in R was characterized by apnea, absence of laryngeal reaction, and cough compared to F. The mean propofol dose administered in F [0.3 ± 0.1 at start to 0.2± 0.1 mg/kg/min for maintenance] was significantly higher than in R [0.17 ± 0.1 at start to 0.16 ± 0.01 mg/kg/min for maintenance]; (p= 0.008 at start and p=0.02 for maintenance). The mean fentanyl CRI dose was 0.17 ± 0.01 mcg/kg/min after induction and 0.13 ± 0.01 mcg/kg/min during maintenance. The mean remifentanil dose was 0.1 ± 0.02 mcg/kg/min after induction and 0.16 ± 0.05 mcg/kg/min during maintenance. The cardiovascular and respiratory parameters did not differ significantly between the two groups; however, 4 animals in F required dopamine for maintaining normotension. Extubation time was shorter in R compared to F [8 (6– 10) and 18 (14– 22) minutes respectively]; (p< 0.01)]. All recoveries were uneventful. In conclusion, the new remifentanil-propofol TIVA proved to be a beneficial refinement for macaque neurosurgery, providing smoother intubation, cardiovascular stability, stable anesthetic plane with lower propofol requirements and faster recovery.

REFINEMENT OF PISTON MICRO-CONTAINER ADMINISTRATION IN SPRAGUE-DAWLEY RATS: UTLISING ANEATHESICS TO MITIGATE DISTRESS

Cor Bester, Kobus Venter, Dr. Wihan Pfeiffer

DSI/NWU Preclinical Drug Development Platform, Faculty of Health Sciences, North-West University (Potchefstroom Campus), South Africa

INTRODUCTION: Preclinical testing of new drugs in laboratory animals are often required in drug development. The in vivo testing of pharmaceutical dosage forms often hold challenges to mimic oral administration and the subsequent absorption and bioavailability. Micro-containers (MC) were developed to simulate the administration of solid dosage formulation in rodents. During research project (Ethics approval: NWU-00768-22-A5), the administration of MCs was done according to recent literature, which resulted in risk of serious injuries. This necessitated refinement of the procedure. The study was amended to sedate the rats before administration, mitigating the risks identified.

METHODS: Sprague-Dawley rats (n=24) were dosed with size 9 gelatine capsule using a MC piston applicator. Rats were sedated with isoflurane using a VetFlo anaesthesia system immediately before oral administration.

RESULTS AND DISCUSSION: During the pilot study, insertion of the 120 mm long applicator needle into the oesophagus of conscious rats, provoked struggling behaviour risking, potentially fatal injuries such as rupture of oesophagus and asphyxiation due to firmer restraint. After refining the procedure, no distress signs — struggling behaviour or vocalization — was observed during MC administration in sedated rats. All the rats had fully recovered from isoflurane sedation within a minute after oral administration. Since it is reported that both isoflurane and acute stress reduce gastrointestinal transit in rats, the beneficial effect of stress reduction on animal welfare should enjoy preference.

CONCLUSION: We recommend that isoflurane sedation become the standard practice during oral administration of MC in rats, as refinement to alleviate distressful behaviour.

FROM LABORATORY ANIMALS TO HUMANS: THE TRANSLATION OF SEVERITY SCORING FOR INTENSIVE CARE MONITORING

André Bleich[1,2], Philipp L.S. Ohland[2], Steven R. Talbot[2]

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The Relative Severity Assessment (RELSA) score has been successfully used to quantify severity in laboratory rodents. It has made an important contribution to monitoring welfare following the 3Rs. Severity is quantified mathematically by fusing various vital and behavioral data. The resulting score is then mapped to a reference set of defined severity, providing relative context.

The method may also provide valuable benefits in human medicine, where scores are a common tool for assessing specific disease severity. Still, actual real-time or continuous scores are uncommon. In a first attempt to translate RELSA to the human scale, data from a pediatric ICU at the Hannover Medical School (MHH) were used. The goal was to quantify disease severity over time using regularly collected vital signs. An intensive care environment is particularly suitable for this purpose, as data can be collected continuously by monitoring the patient. This adapted version of the RELSA, the Patient Vital Status (PVS), showed a significant increase in the presence of sepsis or systemic inflammatory response syndrome (SIRS), demonstrating the potential to explore further the quantification and grading of patient severity.

The data used vital signs such as heart rate, blood pressure, temperature, and oxygen saturation, which can be obtained in all ICUs. Age-dependent values from literature were used as baseline data. Deviations from the norm were considered an increase in disease severity. The PVS shows promising potential, e.g., as a predictive tool, allowing forecasts and severity classifications in human patients and assisting physicians in complex clinical data environments.

BREEDING OF GENETICALLY ENGINEERED MOUSE MODELS – CHALLENGES, OPPORTUNITIES AND LESSONS LEARNED

Daniel A. Breustedt, Juerg Schwob, Roland Sollberger, Martin van de Velde, Filippo Gallegra, Cecile Pfaff, Alexis Henry, Fanny Decarpentrie

Novartis Biomedical Research, Basel, Switzerland

Introduction:
Genetically engineered models (GEM's) are playing an important role in biomedical research. The number of available GEM's and also their complexity has significantly increased over the past years, with animals carrying multiple modifications becoming the norm rather than the exception. The generation and maintenance of such complex GEM's leads to the generation of a great number of mice with undesired genotypes due to the underlying mendelian genetics.

Aims:
Finding an appropriate balance between meeting research needs but not producing significant numbers of surplus animals poses a significant challenge for any breeding facility. We addressed this problem by establishing a breeding coordination team that manages the colonies and serves as the link between researchers and animal caretakers.

Results:
We were able to reduce the number of animals born in our facility from 36'000 in 2015 to 29'000 and 23'000 in 2016 and 2017, respectively, while maintaining the number of animals delivered to research constant at around 8'000 per year. In parallel, breeding cage numbers and genotyping workload were reduced by 30 %. We have since continued to manage colonies in the described way and these performance indicators have remained constant, pointing at a long-lasting effect of the implemented measures. In addition, a simple but robust system to forecast cage numbers was implemented.

Conclusions:
Centralized management of the GEM colonies has led to a significant reduction of surplus animals and cages. Regular interaction with line users, as well as the review and optimization of operational processes, were key to these reductions.

ENRICHED RAT HOUSING USING RABBIT CAGES

Lena Brix, Alina Ottlewski, Jacqueline Krzempek, Petra Meyer, Heidi Bogumil, Alfredo Antolin Abalde, Christa Ziegowski, Kerstin Schwabe, André Bleich

Hannover Medical School

Housing conditions affect various physiological and behavioral parameters in rats. In Europe, the minimum standards for housing laboratory rodents are set out in the ETS 123 guidelines and the directive 2010/63/EU. Nevertheless, there is continuing debate on how species-appropriate housing to these standards is.

One of the main arguments put forward against keeping rats in standard macrolone cages is the limited possibility of separating areas of different function (i.e. defecation, sleeping and feeding). Furthermore, common explorative behavior may not be satisfied in a standard cage and the space necessary for additional enrichment, toys or nest boxes is scarce. However, replacing caging systems in a laboratory animal facility is expensive and the chosen solution must not hinder appropriate care of the animals.

We utilized already available guinea pig and rabbit cages and applied custom modifications in order to create novel housing areas for rats. Furthermore, multiple standard type IV cages were directly connected in a row using tubes. While the guinea pig cages proved to be less accommodating, the modified rabbit cages as well as the connected standard cages allow for the housing of larger stable groups of rats and for the supply of more diverse enrichment; the latter also in ventilated cabinets. While this strategy involves more time for maintenance work such as cleaning, the caretaking personnel are giving positive feedback due to the higher estimated animal welfare. In conclusion, providing more complex housing conditions is manageable in laboratory settings with the existing equipment and contributes to the 3Rs concept.

IMPROVING BIOMEDICAL RESEARCH BY AUTOMATED BEHAVIOR MONITORING IN THE ANIMAL HOME-CAGE" (TEATIME) COST ACTION 20135

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An aim of the action is to map and compare the strengths and limitations of the different home-cage monitoring (HCM) systems. These systems provide 24/7 collection of behavioral and physiological data in undisturbed mice, minimizing the impact of stressors, such as human interaction and provide an undisturbed behavioral profile and wider insights into pathologies and genetic alterations. Automated HCM importantly constitutes an improvement for assessing the welfare of the animals during their lifetime in the laboratory, before and during experiments, or during recovery from procedures.

Developing refined experimental conditions can substantially improve animal welfare as guided by the principles of the 3Rs. Such continuous minimally invasive monitoring allows for rapid and more humane interventions at the earliest sign of potential animal suffering and contributes to an earlier implementation of humane endpoints. HCM systems could also move behavioral research from the "5-minute test", out of homecage paradigm to unstressed, multi-parametric, automated, long-term data logging and artificial intelligence/machine learning technologies to analyze large datasets ('big data'). Despite these promising outputs there are important issues to address. These systems are costly and it may be questioned if the typical "home-cage" for a rodent provides a habitat where natural, undisturbed behavior can take place. Also, these systems create considerable amounts of data – and the need for an infrastructure to properly plan studies and handle and analyze datasets must not be underestimated. This report is based upon work from COST Action 20135 supported by COST (European Cooperation in Science and Technology).

COMPOSITE MEASURE SCHEMES - AN APPROACH FOR EVIDENCE-BASED COMPARATIVE SEVERITY ASSESSMENT AND REFINEMENT

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Evidence-based severity assessment is essential for ethical and legal reasons. However, reliable assessment of suffering in laboratory animals is often complicated by the multidimensional character of distress and pain. Therefore, composite measure schemes comprising various parameters can be used to obtain relevant information about an animal's distress. Here, we focused on identifying suitable parameters to design a composite measure scheme as a basis for comparative severity assessment and refinement measures. Various behavioral and biochemical data were obtained from different induced and genetic rodent models of neurological and psychiatric disorders. A preselection of parameters ensured standardized analyses for all models. Subsequently, data sets were subjected to a bioinformatic workflow, including correlation, principal component analysis, and k-means-based clustering. Parameters that proved to be sensitive indicators of animal distress included burrowing, saccharin preference, open field activity, and fecal corticosterone metabolites. Correlation and principal component analyses provided additional information for the design of composite measure schemes. Data were then subjected to cluster analyses, enabling the allocation of individual animals to different severity levels. In addition, the results provided information for a direct comparison between models. In conclusion, the findings indicate that the bioinformatic approach confirmed the suitability of the composite measure schemes for evidence-based severity assessment across different models. In detail, the schemes can be used for individual severity classification and allow comparisons between experimental groups or different induced and genetic models. In addition, the approach can help to validate potential refinement measures. Supported by Deutsche Forschungsgemeinschaft (FOR2591, PO681/9-1 and -2, LI588/5-1 and -2).

DO ANIMALS EXPERIENCE VISCERAL CARDIAC PAIN? ASSESSMENT OF PAIN THRESHOLDS IN GÖTTINGEN MINIPIGS UNDERGOING CLOSED-CHEST MYOCARDIAL INFARCTION

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Minipigs are often chosen for modelling myocardial infarction (MI) for their cardiovascular similarity to humans. However, their pain after MI has never been qualified neither quantified. We aim at assessing cardiac pain comparing mechanical and thermal thresholds of areas in which it is expected to be referred.

Thresholds were recorded before (Day 0) and after (Day 1 and 45) closed-chest MI followed by reperfusion in 24 minipigs, 15 ± 2.5 months-old. Left and right chest (LC, RC), forearm (LF, RF) and neck (LN, RN) were tested. Thresholds were compared among days for each site with One-Way repeated measures ANOVA followed by Hold-Sidak method. Significance was set at $p \leq 0.05$. Mechanical thresholds (Newton) decreased significantly at day 1 (b) and 45 (c) compared with 0 (a) at LF (a: 77 ± 22; b: 62 ± 26; c: 62 ± 26), RC (a: 67 ± 18; b: 54 ± 20; c: 53 ± 15), RN (a: 59 ± 20; b: 51 ± 22; c : 44 ± 14), and LN (a: 64 ± 48; b: 48 ± 24, c: 47 ± 17). They decrease significantly only at day 45 compared with 0 at LC (a: 61 ± 21; c: 49 ± 12 Newton). Thermal thresholds (°C) decreased significantly at day 1 compared to 0 at LC (a: 48 ± 5, b: 43 ± 2) and RN (a: 50 ± 5, b: 46 ± 5).

Acute and sub-acute thresholds decrease might indicate increased nociceptive referred pain in the tested areas.

MULTICENTER VALIDATION OF A 3D PRINTED MODEL FOR RODENT BASIC SURGICAL TRAINING. VALIDATION METHODOLOGY AND PRELIMINARY RESULTS

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A novel 3D-printed rodent surgical simulator developed aiming to provide a reliable animal-free training platform was subjected to a multicenter validation study. The study involved six research institutions from Europe and the United States aiming to objectively evaluate the content (suitability as a teaching tool) and face (realism and appropriateness) validity of the training model.

A comprehensive and standardized approach was used to harmonize the testing procedure and data collection among the participant institutions to provide reliable results for the lab animal community. A set number of experienced and inexperienced rodent surgeons received the same standardized orientation information and performed the same standardized tasks (for several pre-established iterations) with identical tools and supplies. Upon the completion of the different tasks, all participants filled out a user feedback survey. Standardized images and pre-determined scoring criteria were used to evaluate the performance of each participant in a double-blind fashion across all institutions. With the multicenter validation study currently ongoing, this communication details the validation methodology used and provides the audience with a preview of the preliminary results obtained.

The authors believe these collaborative efforts between veterinary professionals across different institutions and territories, aimed not only at validating training tools but also at harmonizing training approaches, are key initiatives that our professional college and societies (ECLAM ESLAV) could actively pursue for further benefit of research and animal welfare across the board.

BALANCING ANIMAL WELFARE, COMPLIANCE, AND RESEARCH IMPACT - THE CONTINUALLY SHIFTING ROLES OF LABORATORY ANIMAL VETERINARIANS

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Laboratory Animal Veterinarians have many different roles in animal care and use programs, those of clinician, animal welfarist, compliance administrator, subject matter expert, and consultant. It is often difficult for individuals within the institution's research community to discern what role the veterinarian is occupying at a particular point in time. To ameliorate inadvertent conflation of roles, veterinarians should focus on emphasizing, communicating, and demonstrating the role(s) they represent during interactions with researchers, staff, leadership, and others.

Additionally, veterinarians have multiple competing priorities when ensuring the welfare of the animals in their care, since they must also manage the reputational risk of the institution and support a robust research infrastructure. The conflation of animal welfare and compliance can prove especially difficult for veterinarians to successfully navigate. To minimize such commingling, detailed processes can serve to minimize the impact from differences in personalities, training, backgrounds and approaches, and philosophical views.

In this session, the differentiation and determination of animal welfare, regulatory noncompliance, resource constraints, researcher needs, and provision of research advice will be discussed with an emphasis role delineation and transparency.

NON-AVERSIVE MOUSE HANDLING IMPLEMENTATION IN A LARGE SCALE PHARMACEUTICAL ANIMAL FACILITY

Valerie Cordier, L. Ansel-Bollepalli

Novartis Pharma AG

Tunnel handling is a non-aversive handling method with proven, positive impact on lab mice welfare. Several labs in different institutions replicated the original finding that cup- or tunnel-handled mice present lower stress levels than tail-picked counterparts. Yet, despite the demonstrated benefits, tunnel handling (and non-aversive handling methods in general) typically fail to be implemented in large scale institutions. The main objections to non-aversive handling include perceived increased workload, failure to understand the benefits, belief that many studies/animal models are incompatible. Here, we present the strategy that allowed the successful implementation of non-aversive handling as the standard handling method at Novartis-Basel (Switzerland).

RE-USING ANIMALS TO IMPLEMENT REDUCTION AT THE NETHERLANDS INSTITUTE FOR NEUROSCIENCE

Miranda Cozijnsen, Viola Galligioni

Netherlands Institute for Neuroscience

When performing animal experiments, applying the 3 Rs should always be strived for as much as possible. At the Netherlands Institute for Neuroscience (NIN) we found a way to specifically reduce the amount of animals (that are ordered from external vendors) by using Surplus and when compatible, previously used animals for our training and experiments.

Rats and mice of different strains (wildtype and GM) and ages can become available from different sources:
1) mice from our breeding facility
2) mice from our experimental unit
3) rats from our experimental unit

Provided that the discomfort level of these animals will never exceed the moderate status after re-use, they can be requested for to the facility manager. Researchers need to specify: date of use, species, amount, age, sex, strain/background, protocol number and location.

Following the application for re-use animals, team Animal Welfare Officers will check the experimental protocol of the animals and whether the animals are eligible for re-use. After their consent the animal can be requested for.

For training purposes and some experiments, the requirements for animals used are not that specific. Considering that the NIN is a small institute, and many experiments involve only behavioral tests we found this process is addressing researchers' needs and it improves the application of one of the three Rs: the reduction.

TRANSITIONING FROM PINE TO ASPEN: ENSURING ANIMAL WELFARE AND RESEARCH INTEGRITY AT THE JACKSON LABORATORY (JAX)

Victor Cuevas, Kristin, Blanchette

The Jackson Laboratory

During a recent AAALACi site visit, The Jackson Laboratory (JAX) received a suggestion to evaluate the use of pine bedding in research animal cages due to its potential impact on study outcomes and animal welfare. Pine bedding has been shown to interact with experimental treatments, affecting biochemical parameters in rodents, contrary to recommendations outlined in the Guide for the Care and Use of Laboratory Animals. Additionally, pine bedding may cloud animal boxes during autoclaving, hindering the ability to perform thorough welfare checks. JAX typically employs a non-pine bedding blend for animals.

To comply with this suggestion the Animal Welfare Compliance Office took the following steps:
1. Identified Principal Investigators approved to use pine bedding and assessed their current usage status.
2. Established an IACUC subcommittee to review protocols still employing pine bedding.
3. Required Principal Investigators wishing to continue pine bedding use to justify their choice and submit an amendment to the IACUC.
4. Amendments that received approval, were approved until study completion, safeguarding data integrity.
5. Monitored pine bedding usage until all animals were transitioned to aspen blend bedding.
Through these measures, JAX ensured adherence to welfare standards and maintained research integrity. Ultimately, all study animals successfully transitioned to a non-pine bedding.

STAPHYLOCOCCUS XYLOSUS ASSOCIATED MORBIDITY AND DERMATITIS IN NUDE RATS

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In 2023, 64 female nude rats (Hsd:RH-Foxn1rnu) were included in a study on the repair of critical size osteochondral defects. From August to October, 4 animals required humane killing due to rapid weight loss. Animals remained bright, active and alert. Three animals also showed (subtle) red, scaly skin and chromodaccryrhea.

The second animal was sent for histology; marked neutrophilic pustular and hyperplastic, hyperkeratotic dermatitis with multifocal lymphocytic interface dermatitis and keratinocyte apoptosis was noticed. Numerous Gram positive cocci were attached to the keratin and present within pustules. The spleen showed lymphoid hyperplasia. The other organs were normal. The same histological lesions were present in case number 3 and 4 . Skin and throat swabs taken from case 3 were negative for pathogens on the FELASA 2014 list. From the 4th case, a skin swab was taken for culture and was positive for Staphylococcus xylosus.

The skin of the remaining animals was swabbed and 2/10 animals were positive for Staphylococcus xylosus although none of the animals showed skin lesions nor morbidity. After the experiment, 2 positive and 2 negative animals were send for histology. The negative animals showed no dermal lesions; the positive animals showed hyperplastic and hyperkeratotic lymphoplasmacellular keratitis, mainly around the snout.

Staphylococcus xylosus has been associated with morbidity in mice. An identical combination of pustular dermatitis associated with interface dermatitis is described in mice with Staphylococcus xylosus infection. However, to our knowledge, this is the first report of Staphylococcus xylosus associated morbidity and dermatitis in nude rats.

BACKCROSSING COLONIES OF GENETICALLY ALTERED MICE IMPROVES COLONY HEALTH AND NUMBER OF PUPS WEANED

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It is well recognised that backcrossing of genetically altered (GA) mice is important in reducing genetic drift away from the background inbred line. We hypothesised that, in addition, backcrossing might affect breeding performance and colony health.

Data analysis of colonies at the University of Dundee that have been routinely backcrossed (47 colonies, total 18926 mice) were compared with colonies which have not (65 colonies, 22748 mice). Average loss of pups to weaning was 16% in backcrossed colonies (range 3-30%) and 21% in non-backcrossed colonies (range 0-63%). Over all colonies, there was therefore a 5% higher number of pups weaned in backcrossed colonies. The percentage of sickness rate was calculated both including and excluding pups culled / lost prior to weaning. Including these pups, the sickness rates for backcrossed and non-backcrossed colonies are 2.5% and 4.4% respectively. Excluding pre-weaning pups, the sickness rates are 1.7% and 3.1% indicating an almost doubled rate of illness requiring cull in non-backcrossed colonies. Analysis is ongoing to investigate whether the difference is due to an increased incidence of specific clinical conditions.

The Dundee data implies that backcrossing not only prevents genetic drift, but also improves colony health and numbers weaned. To examine whether this effect is replicated at other facilities, comparative analysis is being undertaken of data generated from the University of Aberdeen, as well as further investigation into other potential differences between colonies, such as nest-building ability. The outcomes will be presented.

PERIBULBAR ANESTHESIA DECREASES CORNEAL AND PERIOCULAR SENSATION AND CAN IMPROVE RAT WELFARE DURING OPHTHALMIC PROCEDURES

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Rats are commonly used as an animal model to study glaucoma, which is induced using painful procedures. Study goals were to compare the efficacy and safety of two peribulbar anesthesia (PBA) approaches.

Eight ophthalmologically normal rats were used to compare dorso-medial versus medial-cantus PBA injections in a randomized, masked, crossover design. Under isoflurane anesthesia, bupivacaine 0.5% at 0.05 mL 100-gram-1 was injected using one approach and following 2-week washout, the second approach was tested (contralateral side). Intraocular pressure (IOP) was measured under anesthesia before and up to 10 minutes following injections. Corneal (Cochet-Bonnet esthesiometer) and periorbital (von-Frey; 4-points) sensitivities were tested at baseline and up to 24 hours following injections. ANOVA, Wilcoxon signed-rank and t-test were used for analysis. Significance was set at 0.05.

Mean IOP significantly increased from baseline at 5-10 minutes (dorso-medial; 15.6 ± 2.8 versus 23.3 ± 7.0 and 23.6 ± 6.3 mmHg, respectively) and at 5 minutes (medial-cantus; 15.8 ± 2.5 mmHg versus 22.0 ± 3.1 mmHg). Median (range) corneal sensitivity decreased from baseline [3.75 (3-4.5)] to 0 (0-2) for 1 hour and remained significantly reduced up to 6 (dorso-medial) and 4 (medial-cantus) hours, with dorso-medial providing significantly lower sensitivities. Periorbital sensitivities were significantly decreased for 2-3.5 (dorso-medial) and 2-4 (medial-cantus) hours. Exophthalmos was observed in 5/8 eyes of both approaches and resolved within several hours.

Dorso-medial PBA provided better and longer corneal anesthesia than medial-canthus approach, however, IOP increased following both approaches. Further studies should assess PBA efficacy and safety in ophthalmic surgeries in rats.

MANAGEMENT OF GÖTTINGEN MINIPIGS SOWS ENROLLED IN LACTATION STUDIES DURING THE PERIPARTUM: STANDARDIZATION OF A REFINEMENT PROTOCOL

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Management of laboratory animals must account for the specific species features, health status and type of procedures, but the physiological and mental stage is critical too. Since porcine species shows close similarities to humans, its use in research trials is becoming predominant for several purposes including regulatory and surgical ones and is being proposed to assess drug exposure during lactation. This report aims at proposing an implemented management protocol of peripartum sows and newborn piglets focusing on husbandry, environmental enrichment, training, and procedure refinement (blood/milk sampling). Sixteen (n=16) pregnant Göttingen Minipigs sows and their offspring were followed in the peripartum period from the arrival at the facility (1 month before farrowing) to piglets weaning. Sows were housed in groups up to 5 days before farrowing, then moved to free farrowing cages. Straw was used as material enrichment to allow for maternal behavior and nesting, and thermal insulation for piglets. Sows were clicker trained for the entire peripartum period to reduce manipulation-induced stress. The pharmacological trial was only commenced on the second lactation week to allow development of maternal bonding, and a PICC (peripherally inserted central catheter) was placed in the auricular vein to refine repeated blood samplings of the sows. In addition, to reduce stress, piglets were sedated by inhalation anesthesia during blood sampling. The combination of the above-mentioned strategies allowed for a well-tolerated trial with relative low impact on animal welfare and seems to represent a good standardizable approach to husbandry of pigs during the peripartum period.

IMPLEMENTATION OF A ROTATING ENVIRONMENTAL ENRICHMENT PROGRAM IN MICE

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Introduction

It is vital to provide a suitable rich environment to ensure laboratory animals welfare for ethical reasons and to guarantee the validity of research.

To improve environmental enrichment for mice housed in our center, it was critical to increase homogeneity and implement a rotating program.

Materials and methods

Cages with 1 to 5 adult C57BL/6J mice or crosses with their offspring were evaluated. Elements were selected to allow animals to increase their activity and physiological behaviors, hide/shelter and build nests. Cardboard tunnels and cellulose tissues were added to each cage combined with brown or white cellulose flakes, paper crinklets, cotton rolls or wood blocks. Enrichment items rotated every two weeks. Reproducibility, ease of use, frequency of use/interaction, durability, nest quality and price were evaluated.

Results

It was more difficult to standardize the quantity of flakes and crinklets per cage, and the time taken for their disposal was longer.

White material (tissues, white flakes and cotton rolls) facilitated the detection of births and fights, favoring the detection of blood, compared to brown flakes and crinklets.

Mice interacted less with flakes, and their use to make nests was limited. In contrast, the presence of cotton rolls improved nests quality.

The durability of wood blocks was noteworthy.

The most economically competitive items were tissues, cotton rolls, tunnels and wood blocks.

Conclusions

We propose an environmental enrichment program for mice alternating every two weeks (1 tissue + 1 cotton roll + 1 tunnel) and (2 tissues + 1 wood block + 1 tunnel).

IT'S ALL ABOUT BIG DATA: HOW DIGITAL INNOVATION IN MOUSE HOUSING CAN CONTRIBUTE TO THE 3RS

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Introduction: Technologies aiming to undisturbed home-cage recording of mouse activity and behaviour have been and are still progressively developed in a bid to automate data collection and interpretation. As a positive consequence, today massive data sets can be recorded and saved in the long-term, providing information on animal wellbeing, clinical status, baseline activity and deviations in case of experimental interventions. Prospectively, large data sets can also serve as a long-term reservoir of scientific data that can be re-analysed and repurposed upon need.

Methods: Through review of relevant bibliography, we present how the impact of Big Data deriving from home-cage monitoring (HCM) data acquisition, particularly through Digital Ventilated Cages (DVCs), can support the application of the 3Rs. Particularly, we analysed the nexus between HCM derived data and generation of Big Data, investigating how Big Data key characteristics – namely Volume, Velocity, Variety, Veracity and Value or 5Vs - can serve one or more specific R.

Results and Conclusions: High data Volume recording sustains all the 3Rs by remote control of animal activity, support of longitudinal studies requiring a lower number of animals and data repurposing. Direct raw data recording (Veracity) sustains Refinement, Reduction and Reproducibility, thanks to high reliability of data collected and metrics development. High speed recording (Velocity) and multiparameter assessment of animal activity and behaviour (Variety) sustain Refinement allowing for punctual control of animal activity and creation of early alerts for welfare-related issues. Finally, creation of data banks and share (Value) is a rising and promising enhancer for Replacement.

INTER-DEPARTMENTAL COLLABORATION AS KEY ELEMENT IN ANIMAL RESEARCH PROGRAMS

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When running an animal facility (AF), management of the team through efficient communication is important. However, other departments are also involved to achieve animal welfare and research robustness.Certainly, collaboration with Animal Welfare Officers (AWOs) is crucial, to promptly manage animal welfare issues and correctly report discomfort. In a neuroscience institute, also, there are always challenges to make implants or headposts properly fitting, without impairing animal welfare.We provide here examples on how constructive communication with other departments (i.e. AWOs and mechatronics) has improved experimental procedures and animal welfare.

QR codes implementation at the cage level improved available information related to animal welfare. When animals enter experimental procedures, welfare diaries, registering procedures and observations, are created. They are accessible at the cage level through QR codes, that can be scanned by staff, researchers, AWOs and inspectors. This way, both experimental data and welfare information related to that animal are easily entered and accessible. This is usually not possible by using facility software available on the market.

Our mechatronics department created 3D printed (gas) anesthesia masks for stereotaxis frames, which allow more flexibility for surgeries requiring a forward tilt up to 90 degrees. Other examples of collaboration are 3D printed skulls available for training and resin platforms to adjust the height of animals of different ages and sizes in stereotaxis frames.

The examples provided show that management of an AF goes beyond management of its own team, and to improve animal welfare, it has to productively collaborate with other departments.

PRELIMINARY DATA OF A FEEDBACK SURVEY ON THE USE OF 3D-PRINTED MOUSE TAIL MODELS IN I.V. INJECTION TRAINING AND FUTURE DEVELOPMENTS

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Intravenous (i.v.) injections are a commonplace experimental procedure to deliver substances in laboratory mice. A limited number of easily accessible veins and the technical difficulty of injecting into these small blood vessels necessitates ample training for the operator to succeed. We developed a 3D-printed mouse tail model on which these i.v. injections can be trained in the beginning without the need of live animals. To prove their efficacy for training, several mouse tail models were sent out internationally and evaluated in an online feedback survey. Preliminary results indicate a high level of satisfaction in terms of anatomical accuracy, usefulness for training and increase in confidence to inject live animals afterwards. However, criticism was also expressed towards the size and material color of the tail model. Encouraged by the positive feedback as well as the respondents' suggestions for optimization, we developed updated model versions, ready to be tested in a follow-up project to improve on the training experience and outcome. In our assessment, 3D-printing modalities have great potential to complement existing training protocols with realistic animal models and prospectively reduce the number of live animals needed.

PREGNANT OR NOT? - PREGNANCY DETECTION IN RESEARCH SHEEP

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AO Research Institute

Sheep are frequently used animal models in preclinical research. However, unlike for rodents or rabbits, there are no commercial breeders for research sheep. Thus, sheep are commonly purchased from conventional “farm” breeders. Next to the hygiene status that may vary in those sheep, also the pregnancy status is often not known.

To prevent using pregnant sheep in studies, there are several methods to detect pregnancy. A commonly used method is to test the serum concentration of pregnancy-associated glycoprotein (PAG), a protein produced in the placenta of ruminants. It is considered save to detect pregnancy from the 35th day of gestation and it doesn’t require specific skills or expensive equipment.

Here we report our findings in the use of PAG tests compared with abdominal ultrasound and the real outcome of pregnancy. We could see false negative results in both PAG test and abdominal ultrasound as well as false positive results in the PAG test.

As in the research setting a false negative result is ethically not acceptable, a multi-step approach for pregnancy detection is suggested.

FILTERS VS LIVE SENTINELS

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The traditional use of live sentinel mice and rats for monitoring animal health status in rodent facilities has been associated with challenges, including exposure to soiled bedding conditions and welfare issues due to transmission from colony animals. Until recently, the sensitivity of environmental air dust (EAD) was insufficient to completely replace live sentinels. To respond to these drawbacks, the sentinel-free soiled bedding filters (SFSB) were developed.

In this study, we compare soiled bedding filters versus EAD filter versus live sentinels in four racks of a ventilated cage system, in a Virus antibody-free (VAF) health status, within the Instituto de Medicina Molecular (IMM-JLA) Rodent Facility, with the goal of comparing effectiveness, time/cost impact of each monitoring strategy and impact on facility staff. All aiming to achieve a sentinel-free, reliable, monitoring system, reduce burden on facility staff and, if possible, reduce health monitoring costs.

Our results demonstrate a higher sensitivity of dirty bedding filters in detecting potential pathogens, while also showing a lower burden on facility staff, either in reduction in sample collection time and in all time dedicated to husbandry and care provided to sentinels. Regarding costs, all added costs are lower in soiled bedding filters.

These findings can contribute to establishment of more efficient health monitoring programs in rodent facilities. Moreover, soiled bedding filters would alleviate welfare concerns associated with live sentinel use. This transition would not only reduce the number of animals euthanized but also streamline monitoring processes and enrichment strategies in research settings.

DEVELOPMENT AND IMPLEMENTATION OF AN ANIMAL WHOLE LIFE CYCLE MANAGEMENT SYSTEM

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In order to enhance animal welfare and establish a humanistic management process, as well as improve the overall management of animals within our barrier facilities and mitigate potential biosafety risks, we have developed an animal whole life cycle management system using the Microsoft PowerApps platform. This system enables efficient and paperless management of animals within our facility.

Upon the arrival of animals at our facility, administrators enter their identity data into the system, including batch number, species, strain, gender, vendor information, and so on. Prior to conducting experiments, users apply for specific animals through the system and provide relevant usage information. After completing the experiment and euthanizing the animals, users register the corresponding information. The system allows administrators to search, summarize, and export comprehensive life cycle information of animals in real time.

This animal management system completely replaces the traditional paper records in our facility, offering a more convenient and efficient means of tracking the entire life cycle of animals. It significantly reduces the time researchers in our department spend on record-keeping, improving efficiency by over 75%. Moreover, it reduces the cost of analyzing historical animal data and enhances data analysis efficiency by over 50%. By saving over 3,600 pieces of paper annually, this system aligns with the principles of a green office, energy conservation, and emission reduction.

HARMONIZATION OF ALTERNATIVE TO RESIDENCY TRAINING TO BECOME A DIPLOMATE IN LABORATORY ANIMAL MEDICINE: ARE WE THERE YET?

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Introduction: Traditionally, specialist training in laboratory animal medicine takes place in an academic research establishment under the direct supervision of one or more Diplomates. A veterinarian working in a laboratory animal facility without a residency program may instead qualify for the certifying examination through an alternative training pathway, also called the 'experience route'. The International Association of Colleges of Laboratory Animal Medicine (IACLAM) compared how five colleges in Asia (3), Europe (1) and North America (1) organize their alternative training route, with the goal to establish best practices and reach global harmonization.

Methods: The IACLAM Education Standing Committee assess the training content and requirements for the alternative pathway of the member Colleges by means of a questionnaire and information on their websites.

Results: Each college has established training and/or experience requirements for the alternative pathway. In each college, the certifying examination is the same for residents and trainees of the alternative pathway, as are the publication requirements. Time spent on a PhD involving animal research counts as part of the alternative training. Differences can be found in the duration of training and whether a Diplomate supervisor is required or not.

Conclusion: The alternative training pathways are partly harmonized between colleges. Establishment of best practices will aid harmonization in all aspects.

ENHANCING ANIMAL RESEARCH TRAINING: TALK COURSE

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In 2022, the Animal and Plant Quarantine Agency reported over 4.99 million laboratory animals used for scientific purposes in Korea across 517 facilities, including rodents, rabbits, dogs, pigs, non-human primates, birds, fishes, reptiles, and amphibians. In response to the 2023 “Development of Standard Educational Contents for Animal Facility User” survey, highlighting limitations in existing educational programs such as lack of practical applicability and diversity, the Korea Mouse Phenotyping Center (KMPC) and the Korean College of Laboratory Animal Medicine (KCLAM) developed the “TALK: Training of Animal Research Level-up course.”

The course targets various stakeholders including investigators working with animals in a research, managers, operators, IACUC members, and attending veterinarians. It comprises 70 micro learning modules divided into 8 categories covering legislation, IACUC, maintenance and operation of facility, quality control of laboratory animals, animal welfare and the 3Rs, humane animal experiment, and occupational health safety of personnel. It includes basic/induction training for new users, mandatory training for facility managers operators, and IACUC members according to the Laboratory Animal Act and Animal Protection Act, delivered in MP4 format videos with PPT slides and voice narrations. Future considerations include advanced courses on anesthesia, necropsy, and additional educational content targeting foreign researchers.

The TALK course, developed by KMPC and KCLAM, addresses the pressing need for standardized and diverse educational content in the field of laboratory animal research, aiming to enhance the competence and compliance of stakeholders involved in animal experimentation in Korea.

VETERINARY MEDICAL RECORD SYSTEM USING IT PROGRAM IN KOREA

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The lab oratory animal veterinarian is responsible for veterinary care, management of the laboratory animals, improvement of health and welfare, and reviewing aspects of animal research.

Those processes include careful observation, reporting, diagnosis, notifying and recording. Increasing number of animal research facilities use IT (Information Technology) program to perform this process in Korea.

'Veterinary Medical Record (VMR)' have been used for veterinary care program at the Laboratory Animal Research Center (LARC), The Catholic University of Korea (CUK) since 2018. This system was accepted as an appropriate veterinary management program, when we received full accreditation of AAALAC International.

Laboratory animal technicians (LATs) check the daily animal condition and notify to the veterinarian with uploading photos and videos to the VMR system by using QR code. After that, the veterinarians examine animals and inform researchers about the condition of animals, and explain how researchers care for animals without affecting the research results through VMR. These are sent by email and text message. Researchers including principal investigator can check their animals on the VMR after that visit the LARC and proceed with appropriate treatment to relieve unnecessary pain and distress, and keep animals well until the experiment is over.

VMR helps researchers to keep animals healthier and also guides them to comply with the humane endpoint. Through this, researchers, veterinarians, and LATs are communicating about the condition of animals together and trying to reduce the unnecessary discomfort in animals.

INTRODUCING A NEW BUSINESS EDUCATION PROGRAMME IN LABORATORY ANIMAL SCIENCE: MANAGEMENT TRAINING FOR FUTURE LEADERS

Maria Kamper, Joanna Stanley, Emma Owen

University of Manchester

The delivery of a high quality animal care and use programme is a complex endeavour; it involves the management of a number of key stakeholders, each with their own skills and particular needs. It also requires the management of resources and facilities under the direction of wide-reaching legislation. There is, however, a significant lack of tailored training available for those in management positions expected to deliver these programmes. In a climate where there is growing public concern for animal welfare, the importance of delivering a high quality animal care and use programme has never been greater.

In this presentation we will outline our tailored management courses which are currently under development. These courses will provide those responsible for animal care and use programmes with comprehensive management training, giving them the necessary skills to effectively manage people and resources in a laboratory animal setting with a focus on ethical and responsible practices. We will outline the different options that will meet varied budget, time and qualification constraints. We will also provide further details on the course topics, including people and financial management, facility management, assessing quality assurance and ethical and animal welfare considerations.

LIFE QUALITY OF DIET-INDUCED OBESE RATS CAN BE IMPROVED WITHOUT AFFECTING WEIGHT GAIN AND GLUCOSE-TOLERANCE

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Diet-induced obese rats for in vivo studies are most often purchased from a commercial vendor. At the vendor, rats are housed with minimal environmental enrichment and without chances for socialising across cages. At our animal facility we have the option of connecting cages through a tunnel system, enabling socialisation between cages. Furthermore, we have an activity area which can be used for bouts of play. Nevertheless, these enrichments are seldom used for obesity or diabetes studies out of fear that this could impact data outcomes, precluding comparison to other data where standard housing was used. This assumption is based on a hypothesis that addition of the tunnel system will increase physical active and will, thereby, increase energy expenditure and attenuate weight gain and increase muscle mass and improve insulin sensitivity and oral glucose tolerance. Addition of trips to the activity area would presumably exaggerate these effects.

Increasing life quality by tunnel access between cages as well as trips to activity area had no effects on food intake, weight gain or body composition during 100 days of study. Fasting glucose, fasting insulin, oral glucose tolerance, glucose-stimulated insulin secretion, and plasma levels of stress hormones (ACTH and corticosterone) were also not affected by environmental enrichment.

Our study results clearly demonstrate that for in-house generation of DIO rats for obesity and diabetes studies animal welfare can be increased without concern of compromising data quality.

MICE CAN ALSO BE IN ZEN

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Bodyweight is an important output in experimental animal work, both as a scientific endpoint, as well as an animal welfare assessment.

When weighing mice, we have previously used “weighing boxes” for the animals. The mice often seemed somewhat distressed in the box and tried to jump out, sometimes with success.

When switching handling method, from tail handling to cup and tunnel handling, we found it very difficult to use the weighing boxes. Since we observed that the mice seemed calmer with the new handling methods, we wondered if the weighing boxes were necessary anymore.

We now use yoga mats, cut to fit the scale. The mice keep calmly on the yoga mat, being weighed and voluntarily enters the tunnel or palm of hand, when weighing is over.

The yoga mats can be washed and wiped with ethanol when necessary, but the mice urinate a lot less on the mat, than they did in the weighing box, this provide food for thought.

Everybody, both mice and animal caretakers, are very happy with this change, which is so easy and yet makes a huge difference.

IMPLEMENTING CUP AND TUNNEL HANDLING IN A (LARGE) PHARMACEUTICAL RODENT FACILITY

Maria Kristina Kiersgaard, Marie Petersen, Peter Lund Gade, Helle Nordahl Hansen

Laboratory Animal Science, Novo Nordisk A/S, Denmark

The way of handling mice has been by catching the animal by the tail, lifting it and generally holding the mouse by the tail always, this was considered the only effective and safe way of handling.In 2010 the first article on cup and tunnel handling was published (Hurst et al., 2010). This and following articles demonstrated that catching, lifting and handling mice by cup or tunnel handling is less stressful and creates more trust for the mice.In 2015, we began to look into cup and tunnel handling, however, without the correct instructions, it was unsuccessful.In 2017 a decision was taken at management level, that cup and tunnel handling should be implemented in 2018.Emphasis was on the following:Employees had to change their way of thinking, as well as their way of acting.The employees had to be educated in both the theory as well as the practical aspect of the new methods before beginning the implementation.Time had to be dedicated to training and evaluating.Equipment (tubes) had to be in place.With a dedicated plan and intensive follow-up, a full implementation has been reached, as well as a mind-set change amongst the caretakers.Tunnel and cup handling of mice can be applied in any animal facility. However, training of personnel and management endorsement is essential, and if tunnel handling is desired, tubes must be provided. Hurst, J and West, R. (2010). Taming anxiety in laboratory mice. Nat. Methods 7, 825-826 doi:10.1038/nmeth.1500

ANALYSIS OF PROTOCOL REFUSAL REASONS IN TERMS OF 3RS IN KOREA (2018~ 2022)

Heui Jin Kim, Chae Hong Rhee, Yeon Hwa Park, Si Nae Cheon

Animal and Plant Quarantine Agency

Experimental animal use and animal experiment status in Korea are collected and announced annually by Animal Protection Act. We analyzed protocol review rejection reasons by IACUCs during recent 5 years (2018~2022) and suggested promoting priority on 3Rs to elevate laboratory animal welfare in this study. About 4% (2.9 ~ 4.4%) of protocols are disapproved or asked to revise and submit again by IACUC (here in by after 'refusal') every year. Total 7,724 protocols were refused after protocol review during 2018 to 2022. The refusal reported very highly at universities (65.21%) , and hospitals and health institutions (15.06%), public institutions (10.47%) and industries (9.26%) followed by the institutional type. All IACUC reports the refusal reasons by 13 criteria; those are counted overlapped in one protocol. Unreasonable animal number (2,742, 20.63%; reduction) and unreasonable experimental method (2,263, 17.04%) are counted mostly among 13,291 refusal reasons.

Experimental design and personnel training were slightly decreased from 2020. Refusal criteria were recategorized by 3Rs such as not considering enrichment of animals was as refinement issue, and excluded the 4 reasons related on experimental design (3,397, 25.56%), personnel safety (261, 1.96%) and other (1,564, 11.77%). Refinement issues such as humane endpoint was 31.73% (4,217) and the order of reduction (21.72%, 2,887) and replacement (7.3%, 965).Animal welfare should be considered for animals and for proper scientific results. Especially refinement issues noticed by the IACUC protocol review in Korea. We should develop practical refinement guidance and educate students and researchers with scientific research skills.

NEW TRAINING PROGRAM FOR LABORATORY ANIMAL VETERINARIANS OF KCLAM: LOOK

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The laboratory animal veterinarians (LAVs) play a critical role in ensuring the ethical and legal standards for the scientific use of animals. For these reasons, the social need for qualified LAVs in biomedical research has increased steadily over the past years. The Korean College of Laboratory Animal Medicine (KCLAM) recently developed a new educational program for LAVs which is called LOOK: Laboratory animal veterinarian On-the-job training Of KCLAM. The LOOK 2022 2023 that is firstly conducted are running a hybrid format combination of remote and in-person meeting. Each program consists of seven courses based on The Guide (NRC 2011) for entry level veterinarians and detailed subjects are included IACUC, veterinary care, facility management. After the course, we received the feedback from trainees to improve the training programs. Recently, KCLAM is preparing the practice-oriented learning: LOOK 2024. This program is designed to provide the practical application using the survey and QA session related to specific topics such as LAV role responsibility, facility management and effective prevention and control of rodent diseases. Together, LOOK program is expected to contribute on closing the gap between theoretical content and practice by providing the up-to date information and discussing the work-related issues. KCLAM is trying to provide the continuing education and training for the qualified veterinarians in laboratory animal science to conduct ethical and scientific animal research.

A COMPARISON OF THREE BUPRENORPHINE FORMULATIONS FOR MANAGEMENT OF ACUTE POST-OPERATIVE PAIN IN MICE

Courtney Kirkpatrick, Jackie Fremont-Rahl, Elizabeth Theve, CeCe Brotchie-Fine, Alokesh Duttaroy, Francisco Cordoba

Novartis Biomedical Research

Buprenorphine is a widely used opioid analgesic for managing post-operative pain in mice. The introduction of longer acting formulations is exciting, however their duration of action remains unclear. This preliminary study aimed to compare 3 formulations, buprenorphine-HCL subcutaneous, buprenorphine extended-release (XR) injectable-solution (subcutaneous), and buprenorphine transdermal-solution (topical) in mice. Singly housed female C57BL/6 mice (N=9) underwent implantation of carotid artery blood pressure probe with subcutaneous telemetry placement under an IACUC (USA) approved protocol, then randomly assigned to receive one of the 3 formulations (N=3 per group). Pain behavior was assessed using the Mouse Grimace Scale, nesting behavior and body weight trends and assigned a numerical score. The lowest score a mouse could receive was 0 and the maximum was 14. Mice were assessed by the same individual for consistency. In addition to buprenorphine, all mice received meloxicam and bupivacaine. The results showed that all three formulations attenuated post-operative pain behaviors assessed by the above methods. The buprenorphine-HCL formulation required multiple subsequent doses to maintain adequate pain control. In summary, all formulations of buprenorphine were effective at controlling post-operative pain in mice, but the transdermal and extended-release formulations provided the most effective pain control with the least amount of intervention, confirmed by the lowest scores in comparison to the buprenorphine-HCL formulation. These results provide valuable insights for in vivo researchers and veterinarians when choosing an appropriate buprenorphine regimen for post-operative pain management in mice.

THE 3 C'S: CHALLENGES, CHANCES, AND CHANGE: AIMING FOR THE AAALAC ACCREDITATION IN A NEWLY FOUNDED ORGANIZATION WITH HISTORIC ROOTS

Antonina Klippert, Sven Kirstein, Torsten Dohrmann, Oliver Hubbert, Claudia Christian, Anke Reinhardt, Ronald Boettger, Kristina Ullmann

Nuvisan ICB GmbH

Introduction

Participating in AAALAC's program means excellence for institutions using experimental animals. As a Contract Research Organization this is not only important regarding animal welfare, but also to attract clients and expand the business.

Nuvisan ICB GmbH was founded in 2020 as a spin-off of Bayer. Consisting of former employees and newly recruited personnel, we aimed to bring both parts together in our effort to make the necessary steps and changes to build a successful Animal Care and Use Programme. Due to this unique starting situation, we faced several challenges regarding communication and acceptance for change within the in vivo community.

Results

Designed as classic project management, we realized early on that we were dealing with a more complex change management process. Different opinions collided, and it was difficult to find a unified approach. Therefore, it was important to increase engagement and involvement to gain acceptance for necessary changes. We extended our communication on various levels and identified key persons and set up micro task force groups that addressed a variety of topics with the accompanying communication. These measures helped to build a team spirit. Finally, we were awarded the full accreditation status.

Furthermore, we retrospectively made a survey among the in vivo community to extract learnings for the upcoming reaccreditation.

Conclusion

In the process of building and maintaining a good Animal care and Use Programme, we learned that for our Culture of Care it is imminently important to have a good communication strategy and an involved and valued team.

ULTRASOUND GUIDED QUADRATUS LUMBORUM BLOCK IN SWINE: A PILOT EVALUATION BY COMPUTED TOMOGRAPHY OF THE SPREAD OF TWO INJECTATE VOLUMES

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The ultrasound (US) guided quadratus lumborum (QL) block is an interfascial plane block performed in humans and animals to provide abdominal wall and visceral analgesia perioperatively.The aim of the study was to evaluate the spread of a ropivacaine-dye solution after a QL block in Göttingen minipigs. Two adult Göttingen minipigs undergoing a computed tomography (CT) evaluation as part of an experimental procedure were considered. Under general anesthesia an US evaluation was performed with the animals in sternal recumbency to identify the transverse process of L2, the longissimus dorsi and the QL muscles, and the interfascial plane between the QL and the psoas maior muscle. A QL block was performed with the US probe parallel to the ribs by injecting ropivacaine 0.3 % dye solution between the transverse process of L2 and the interfascial plane. The four hemiabdomens randomly received 0.3 or 0.5 mL/kg injectate. The spread of the solution was evaluated by a CT scan. The animals were euthanised at the end of the evaluations.

The solution spread between the QL and the psoas maior muscles in all but one hemiabdomen in which an intramuscular staining was observed (0.5 mL/kg injection). The solution spread from L1 to L6 for the 0.3 mL/kg injection and from L2 to L5 for the 0.5 mL/kg injection.

In conclusion this approach for the QL block might not result in spreading to the sympathetic trunk in minipigs while potentially affecting pelvic limb innervation. The analgesic efficacy of this technique is to be evaluated.

INNOVATIVE APPLICATION OF INTELLIGENT ELECTRONIC CAGE CARDS IN LARGE-SCALE ANIMAL FACILITIES

Shoutao Liu, Jie Li, Yangzhou Lu, Zhihai Li, Yue Qiang, Yi Tao, Liang Shen

WuXi AppTec, Department of DMPK, Shanghai, China

This poster presents the application of the WuXi AppTec DMPK Electronic Cage Card (ECC, patent number ZL202321100313.5 in China) in large animal facilities for pharmacokinetic experiments. The ECC incorporates radio frequency identification devices (RFID) technology, Bluetooth communication, and e-ink display. It interacts with the Animal Resource Management System (RMS), designed for the repeated use and long-term breeding of animals in pharmacokinetic experiments, enabling real-time and accurate animal management. By identifying RFID chips, the ECC tracks animal location and matches information inside cages. Animal status information, such as during experiments, washout time, or treatment, is synchronized from the RMS to the ECC, eliminating the need for paper labels. Results demonstrate 100% accuracy in obtaining location information for thousands of animals within 5 minutes. The ECC updates animal information within 10 seconds, also with 100% accuracy. This collaboration enhances information-based management, digitizes animal data, visualizes status, tracks animal usage records, and improves the quality and efficiency of animal management.

IMPROVED DETECTION OF MOUSE PATHOGENS IN EXHAUST DUST SAMPLES COLLECTED FROM INDIVIDUALLY VENTILATED CAGE RACK PREFILTERS

David Mayo, Robert S. Livingston, Marcia L. Hart, Marcus J. Crim and Sarah A. Hansen

IDEXX BIOANALYTICS

Dr. Bob Livingston, DVM, PhD, ACLAM Diplomate is the Director of R&D and Scientific Affairs for IDEXX BioAnalytics. His research efforts are directed toward developing, optimizing and evaluating diagnostic methods to detect microbial infections of laboratory animals and to characterize known and novel infectious agents in these species. His research has resulted in over 40 peer reviewed publications.

Real-time PCR testing of dust has provided a significant refinement in rodent colony health monitoring by delivering improved pathogen detection and replacing sentinel rodents for this purpose, consistent with the 3Rs. Several studies have reported results from dust samples collected from the plenum ports, airstream, rack exhaust prefilter (REP) or other areas where exhaust dust collects. Both the location on the rack and the material used to collect the exhaust dust can impact pathogen detection. In this study, we compared real-time PCR pathogen detection of samples collected from two open airflow IVC racks over 3 months using the manufacturers' recommended collection devices as well as a high binding capacity matrix placed in front of the REP. In IVC rack A, 14 viral, bacterial, or parasitic pathogens were detected using the manufacturer's device, whereas 19 pathogens were detected in the REP dust sample. Of the pathogens detected in both samples, the exhaust prefilter sample contained 4- to 71-fold more copies per PCR reaction. In IVC rack B, 6 viral, bacterial, or parasitic pathogens were detected using the manufacturer's device, whereas 15 pathogens were detected using the exhaust prefilter sample. Of the pathogens detected in both samples, the exhaust prefilter sample contained 22- to 96-fold more copies per PCR reaction. These data demonstrate the combined importance of the location and the material used to collect exhaust dust on diagnostic sensitivity and highlight that samples easily collected from the prefilter can provide improved mouse pathogen detection.

PROGRAM-WIDE TRAINING IN RESPONSE TO AN SFI

John Crosby, Timothy Gillis, Rudolph (Rudy) Beiler, M. Mazur

Boston University

Following our AAALAC Site Visit in the summer of 2023 a Suggestion for Improvement (SFI) was provided in response to inconsistent aseptic surgical technique for rodent survival procedures. This was based on conversations held between site visitors and investigative staff from multiple research teams, rather than witnessing any surgeries. The institutional response was to generate an aseptic technique course utilizing pictorial and written guidelines, verbal presentation, and a visual demonstration of acceptable procedures. Variety of learning media was better for a target audience comprised of a wide breadth of surgical experiences and also many native languages. Training was developed to describe and demonstrate the preparation of supplies, surgical sites, and surgeon. One-time attendance was mandatory for personnel on an approved IACUC protocol who perform rodent survival surgery. The example procedure was to implant a subcutaneous osmotic pump followed by incision closure. Mice to be culled from other protocols were used for demonstrations and euthanized at the end of the session. The total number of eligible persons was 583, with a completion target of one year. Going forward, all researchers assigned to perform rodent survival surgery are required to attend a demonstration before IACUC approved is granted. The IACUC Post-Approval Monitoring (PAM) Program will partner with Veterinary Services (VS) to audit rodent survival surgical procedures to determine the impact of this training. As this program was recently launched it is too early to assess effects of this demonstration on the performance of the prescribed aseptic surgical technique.

REFINING INTRA-CISTERNAL ADMINISTRATIONS IN NON-HUMAN PRIMATES (MACACA FASCICULARIS): A MINIMAL-INVASIVE APPROACH FOR NON-SYSTEMIC DELIVERIES OF (GENE) THERAPEUTICS

Matthias Mietsch, Frank Runge*, Thilo Voss*, Betina Pajaziti, Alexandra Duetting, Ulf Michgehl, Jörg Luft, Matthias Mietsch

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The cynomolgus monkey (Macaca fascicularis) represents an established human-relevant animal model to study neurological effects in preclinical toxicology testing. Different approaches exist for the safe and effective delivery of gene therapeutics targeting the central nervous system in this animal species. The aim of the current study was to establish a new minimal-invasive method for cisterna magna drug delivery circumventing the limitations of currently used methods.

Cynomolgus monkeys (Macaca fascicularis; 2 years, 2 kg) were anaesthetized and placed in abdominal recumbency on a restraint device. The lumbar area was shaved, disinfected and a micro incision of the skin was conducted to insert a Tuohy needle which was advanced into the subarachnoid space. A microcatheter and guide wire were inserted within the subarachnoid space and forwarded up to the cisterna magna. Correct placement of the microcatheter tip was confirmed using X-ray. Prior to administration of the test article, the animals were positioned in lateral Trendelenburg position with an angle of approximately 30 degrees, with the head at the lowest point during dosing to facilitate the distribution of test article to the brain. The animals were administered using a syringe infusion pump and primed extension set. Once the microcatheter was removed, the surgical site was closed with a skin suture and the anesthesia terminated.

This novel microcatheter-mediated cisterna magna drug delivery technique was shown to represent a safe and minimally invasive method to deliver test articles into the brain area, thereby refining current approaches and improving animal welfare.

CHALLENGES AND OPPORTUNITIES OF WORKING IN A GNOTOBIOTIC FACILITY

Alessia Montesano

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The mammalian intestinal microbiota consists of millions of bacteria, fungi, archaea, protozoa, and viruses. In the last decades, it has become clear that the microbial communities shape host physiology, immunology, and are involved in both homeostasis and disease development.The complexity of microbiota composition and its with the host makes it difficult to determine the mechanisms and consequences of distinct interactions. One solution is using gnotobiotic animal models with defined microbiological state. Gnotobiotic animals can be “germ – free” (GF), as defined by the absence of any microbiota or colonized with a defined microbial community.To facilitate mechanistic studies of the role of microbiota in mice, we established a gnotobiotic mouse facility. Working in gnotobiotic condition is challenging also for experienced professionals and the workflow needs to be highly standardized.The gnotobiotic conditions are strictly monitored and primary attention is given to the health and well-being of the animals; indeed, we implemented the 3Rs principles (Replacement, Reduction and Refinement) in several steps of our daily work and animal welfare is constantly ensured by a team of specialists.

NESTING MATERIAL PREFERENCE TESTS IN LABORATORY MICE WITH THE VIEW TO IMPLEMENT AN OPTIMIZED ENRICHMENT PROGRAM

Margaux Meurant, Thibault Leclere, Marie-Ange Enault, Patrick Vinclair, Elodie Moureaux

Evotec (France) SAS, Campus Curie, Cedex Toulouse

A well-designed enrichment program contributes to the 3R principle and is a key component of a high-standard animal welfare program and for good research.

We conducted preference tests to evaluate BALB/cByJrj mouses 'interest in selected nesting material, some from our regular program and some new items (Bed-R-Nest, Cardboard tunnel, polycarbonate igloo, paper pool). Then we tested the most suitable enrichments on sensitive mice strains (C57BL/6JRj) exhibiting high agonistic behaviors.

For the preference tests, animal behavior was observed across 10 minutes of scan sampling after introducing two types of enrichment: two types of nesting material or two types of rigid structure. We also used nest scoring to evaluate choice and welfare.

We observed high motivation to interact with the enrichment for the initial five minutes; then the motivation dissipated but increased again at the end of the observations. Same behaviors were observed for males and females with a higher frequency behavior for gnawing the new enrichment (paper pool). Males' interactions were higher than females' ones. Animals interacted more with the cardboard tunnel than the polycarbonate one. Different behaviors were observed according to the type of igloo. Nest scoring evaluation showed that females created a bigger nest and used all the enrichment into the cage. Males nest scoring didn't change a lot because it was already high, but they added all the enrichment present into the cage.

These results led to a new enrichment program which is under implementation in our facilities, taking these results into account, while respecting scientific studies constraints.

COMPOSITE MEASURE SCHEME - EVALUATING THE REFINEMENT POTENTIAL OF MULTIMODAL ANALGESIA FOR MURINE CRANIOTOMIES

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Intracranial surgical procedures are frequently applied in animal-based neurobiological research. Evidence provided by a systematic review raises concerns about the quality of pain management in laboratory rodents undergoing intracranial surgeries. This study aimed to investigate the refinement potential of multimodal analgesia in alleviating craniotomy-associated pain in mice compared to NSAID (nonsteroidal anti-inflammatory drug) monotherapy. Furthermore, we validated sensitive severity assessment parameters for postsurgical pain quantification.

The tolerability and efficacy of four different analgesic regimens combining an NSAID, a local anaesthetic, and a sustained release buprenorphine formulation were assessed in electrode-implanted male and female C57BL/6J mice. Potential adverse effects and postsurgical pain were evaluated with a multidimensional test battery comprising (patho-) physiological, biochemical, and behavioural parameters.

The analysis of individual parameters did not reveal robust group differences. The data were further processed using a bioinformatic workflow to select appropriate parameters for designing a composite measure scheme (CMS) for an evidence-based, comparative severity assessment across analgesic groups. The CMS allowed the allocation of individual mice to different severity levels. Surprisingly, fewer mice in the NSAID monotherapy group and more mice in the multimodal regimens were assigned to the highest severity level.

In conclusion, our findings highlight the relevance of using multidimensional parameters to capture craniotomy-associated pain in mice. Compared to a high-dose NSAID monotherapy, we were unable to demonstrate the superiority of multimodal approaches in reducing postoperative pain. Moreover, the CMS results suggest that the total drug-load should be carefully considered in multimodal approaches.
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SEROLOGICAL SCREENING OF BARRIER MAINTAINED RODENT COLONY

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The periodic health screening of a laboratory rodent colony is essential for ensuring the health status of animals in a colony and the validity of biomedical research data.

The present screening was performed in Barrier Maintained RccHan:WIST Rat (Rattus norvegicus) colony from March 2023 to February 2024. Rats were maintained in a controlled environment, and strict biosecurity measures in the facility. The screening was performed on randomly selected animals in a colony. Selected animals were subject to blood collection under isoflurane anaesthesia. The serum was separated from the collected blood and stored samples at -20 ± 5 °C until further analysis. A total of 88 samples were collected from animals in a year.

In the serological screening, Enzyme-Linked Immunosorbent Assay (ELISA) was used for screening of serum samples for the presence of antibodies of sialodacryoadenitis virus (SDAV), Sendai virus (SV), and Mycoplasma pulmonis. ELISA kits were procured from XpressBio, USA. Test serum samples were run along with Positive and Negative control serum in 96 well ELISA plates as per the testing procedure recommended by XpressBio, USA. A tested ELISA plate reading was taken using the Microplate reader.

This screening showed that none of the samples were positive for the antibodies of sialodacryoadenitis virus (SDAV), Sendai virus (SV), and Mycoplasma pulmonis. The serological screening results indicate that the animals are free from tested pathogens.

Keywords — Biosecurity, ELISA, Pathogens, Serological Screening, Serum

HEMATOLOGICAL REFERENCE INTERVALS FOR LYD PIGS USED IN BIOMEDICAL RESEARCH

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Background: The health and welfare of pigs used in biomedical research is essential to research quality and compliance with the 3Rs. Hematological variables are objective markers to quantitatively determine health issues, exclude animals, and evaluate physiological differences before and after experimental procedures. There are no recent validated hematologic reference intervals (RI) for crossbred Danish-Landrace-Yorkshire-Duroc (LYD) pigs in the literature to aid researchers and veterinarians in the interpretation of these variables.Objective: The objective of this study is to establish hematologic RI for LYD pigs used for biomedical research.

Methods: Blood samples were collected from healthy female LYD pigs (35–65 kg) and analysed using the in-house Procyte Dx Hematology Analyzer. Means with 90% confidence intervals for lower and upper limits were calculated according to guidelines by the American Society of Veterinary Clinical Pathology.

Results: Inspection of 141 pigs led to 133 blood samples available for analyses after exclusions due to clinical signs of disease, inadequate tube filling or presence of macroscopic clots. When calculating platelets and platelet indices, 32 samples were excluded due to abnormal platelet distribution. The RI for red blood cells, hemoglobin, hematocrit, platelets, and white blood cells were 5.10-7.00 x 106/µL, 9.36-12.29 g/dL, 30.46-40.47 %, 216.69-501.81 x 103/µL, and 11.73-25.00 x 103/µL, respectively.

Conclusion: Our study provides RI for commonly measured hematological variables in LYD pigs and disclose differences in comparison to published reference values of other breeds. The RI are useful to guide health assessments of LYD pigs and facilitate improved animal care.

COMPONENTS OF ORGANIZATIONAL CULTURE THAT SHAPE ANIMAL RESEARCH PROGRAMS

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Company values specific to animal research have been identified as a component of the culture of care and other related cultures described within animal research programs (e.g. culture of compliance, safety, 3Rs, and research success). These cultures can best be characterized as sub-cultures operating within larger organizational cultures, since institutions as a whole have to also contend with non-animal research operational concerns (e.g. financial health and planning, technology support, students and teaching, non-animal research activities, non-research facility upkeep and planning, etc.). Therefore, these sub-cultures are all shaped by larger organizational cultures that have a significant impact on shared beliefs, values, and norms held by workers.At a more granular level, organizational culture will determine how, and not just when, multiple components of typical animal research programs - lead veterinarian, principal investigator, institutional official, oversight body, associated administrative offices - will interact from an operational, process, and financial perspective. It is incumbent that animal research program leaders fully understand the dynamics of their organizational culture, and how they should interrelate to produce positive outcomes and enable the desired sub-cultures. Without a larger, enabling organizational culture, efforts to build positive sub-cultures, such as a culture of care, can languish.This session will map organizational communication, vision and planning, motivation and professional development, and work climate to animal research program processes, commonly recognized sub-cultures, and long-term programmatic success or failure.

REFINED POST-ANESTHETIC RECOVERY OF GÖTTINGEN MINIPIGS

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Ellegaard Göttingen Minipigs, Denmark

Anesthesia is commonly employed in Göttingen Minipigs undergoing surgery, or other interventions not suited for awake animals. To various degrees, minipig physiologic- and hemodynamic parameters are affected by the anesthetic protocol chosen. Post-anesthetic care is important in ensuring smooth and rapid recovery and avoiding post-procedural complications. We describe four feasible methods of providing non-pharmacological postanesthetic support: calm and safe housing, monitoring of vital parameters, supplemental heat, and soft padding for physical protection. The increased care regimen during recovery continues until the patient is alert, ambulatory, has swallowing reflexes, and with satisfactory cardiovascular and pulmonary function.The methods proposed here are not exhaustive and measures such as preemptive and adequate analgesia as well as post-anesthetic welfare assessments are essential for optimal recovery.

SAFETY AND ERGONOMICS IN A CAMELID FACILITY

Freya Rigouts Terryn, Vanhoutte, Jana, Clompen, Peter, Geldhof, Marc, Thys, Mirjan, Van Severen, Pieterjan

Sanofi Ghent

The use of camelids in scientific research is increasing, which causes a need for information about an ideal camelid facility with emphasis on safety and ergonomics for both human and camelid. At Sanofi, adjustments and novelties regarding the efficiency, safety, and ergonomics of the overall facility were implemented with the expansion of our camelid facility.

Firstly, faciliatory options such as a specifically designed scale and a recovery area were installed for reducing the chance of accidents and injuries in both humans and camelids.

Secondly, new stables were built based on specific needs of camelids, e.g., low hay boxes and separate openings for the animals, to reduce competition and strife during feedings, while also keeping in mind the ergonomics of the animal caretakers providing the food.

Lastly, mechanical tools such as a wheel loader, electrical wheelbarrows, a silo for concentrate storage, and electrical feeding cart have proven to be essential in providing optimal daily care and keeping the facility clean.

To conclude, the knowledge that was gathered at Sanofi Ghent by working in proximity with these animals for many years was used to improve the way people work safely with these animals in an ergonomic way, while also thinking about the safety and welfare of the animals at our camelid facility.

A COMPANY INTERNAL 3R AWARD IMPROVES ANIMAL WELFARE AND STUDY OUTCOMES

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While the implementation of the 3Rs is a priority topic on the regulatory level based on the Directive 2010/63/EU, the integration of non-scientific personnel into this process is lacking. We therefore set out to create an environment in which the personnel dealing the most with the animals are specifically addressed to come up with their own ideas to improve on the 3Rs. To provide a clear incentive for active participation in improving on the 3Rs, in 2019 we implemented an annual company internal 3R award. We deliberately excluded personnel in management and study lead positions from this award, to ensure participation by personnel working directly with the animals. All suggestions for improvement made by non-scientific staff are obliged to be discussed with respective scientists and approved by the on-site veterinarians prior to implementation to assure safety for animals, staff and study outcomes.The participation in this award process creates a high level of awareness regarding animal welfare and the 3Rs within the key animal personnel and throughout the company. Importantly, it acknowledges any efforts taken to improve on the 3Rs and underlines that animal welfare is a high priority topic within Evotec. Since implementation of this award, we have seen improved animal welfare resulting in improved study outcomes. This simple and highly effective approach to include and sensitize all personnel in the process of pro-actively improving on the 3Rs can easily be adopted throughout academic institutions, CROs and the pharmaceutical industry.

ADDRESSING COMPASSION FATIGUE AND CULLING RELATED EMOTIONAL DISTRESS IN LABORATORY ANIMAL CARE: A WORKFLOW APPROACH

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Compassion fatigue (CF) is the physiological, affective, and cognitive exhaustion that is associated with laboratory animal care. Compared to its human counterpart, CF exhibits a higher prevalence among laboratory animal workers. However, stigma hinders open communication and effective management of this form of emotional burnout. At the Netherlands Institute for Neuroscience, several measures are implemented to address CF amongst caretakers.

Managing culling-related emotional distress in laboratory animal research is a significant challenge. Despite various methods to alleviate animal suffering, inherent human distress persists. Consequently, efforts are directed towards making this emotional burden more manageable.

In our breeding facility, we have implemented a workflow aimed at mitigating the emotional impact of animal euthanasia by limiting culling during the pre-weaning phase. In the Netherlands, distal phalanx amputation for identification and genotyping within postnatal days 5-7 is permitted, and this method has been utilized in our institute for the past 5 years. While debated in many countries, this approach allows researchers to gather crucial data before weaning, thus preventing the buildup of a large euthanasia count. Caretakers therefore, know in advance the approximate culling number per litter, and they can evenly distribute the task throughout the week to avoid a single day of heavy emotional burden.

This workflow was praised amongst caretakers, with many expressing relief at avoiding simultaneous euthanasia and weaning, on the same day, as both of these procedures induce stress. Additionally, sacrificing early postnatal pups was deemed more tolerable due to uncertainty regarding the onset of pain perception.

OPTIMIZING LABORATORY ANIMAL WELFARE : A COMPREHENSIVE APPROACH TO TRANSPARENCY, COMMUNICATION AND INTERVENTION AT THE NETHERLANDS INSTITUTE FOR NEUROSCIENCE

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Open communication and prompt interventions are imperative to address animal welfare problems. At the Netherlands Institute of Neuroscience, a specific workflow is implemented to facilitate swift interventions, thus ensuring optimal animal welfare.

During welfare checks, welfare issues are meticulously examined by staff and reported to all relevant individuals: researchers, veterinarians, and animal welfare officers (AWO). Conspecifics present in the same cage are also evaluated. Notifications are recorded in digital welfare diaries accessible via QR codes on the cage card. Therefore, staff and researchers can access all experimental and welfare information in one place. In cases of distress or pain, besides veterinary advice, animal welfare cards are attached at the cage level to emphasize the need for thorough checks. The welfare cards remain in place until the animal fully recovers or until further decisions are made. Additionally, regarding surgeries, a post-op care card is attached at the cage level until the animal fully recovers. In case an animal is found dead or reaches a humane endpoint, a necropsy is promptly conducted, and tissues are collected for pathology studies. All collected information (individual and collective animal welfare, animals' life history, procedural severity, likelihood of recovery, duration of experimental procedure, study phase, preliminary findings and scientific significance) is freely available to stakeholders and can guide further procedure refinement.

Although initially challenging, this workflow became standard practice and was commended by AWO, staff, and researchers. Furthermore, it facilitated interdisciplinary dialogue, fostering collaboration, crucial for enhancing both research and animal welfare.

3D PRINTED MOUSE MODELS FOR CARDIAC PUNCTURE AND TUMOR MEASUREMENT

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In tumor studies in mice, blood collection techniques and caliper measurement of tumors and are crucial skills for technicians, both in terms of animal welfare and in the context of optimal experimental outcomes.

To address the need for practice with the cardiac puncture technique and the need for uniformity across technicians in tumor measurement, we developed 3D printed mouse models to allow extended and repeated practice without the need for live or dead animals.

To generate the cardiac model, a euthanized mouse in dorsal recumbency whose chest cavity had been opened and emptied was scanned using LIDAR technology and printed using TPL filament. To prepare the model for use, a small balloon was filled with red ink to represent the heart and inserted into the chaste which was then closed using a flexible sealing film.

For the tumor measurement model, euthanized tumor bearing animals were scanned in lateral recumbency. TPL printed models were enhanced with additional modelling clay “tumors” in various sizes due to insufficient initial print quality.

Both models can be used as a first step in training, with the tumor model having additional use for measurement comparisons across the technical team.

Advantages of both approaches include the reduced need for training on animals, a low stress first approach to learning the techniques, an easier transition to working on live animals, and the possibility to repeat and compare for an unlimited number of times. Compared to commercially available models, these 3D printed models are much more cost-effective.

COMPARATIVE EVALUATION OF BLOOD COLLECTION METHODS FOR PHARMACOKINETIC STUDIES IN MICE: SERIAL AND STAGGERED SAMPLING, AND TERMINAL BLOOD SAMPLING

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In preclinical pharmacokinetic studies, it's common practice to collect 3-6 samples at each time point to accurately assess blood pharmacokinetics over a specific time period. This abstract investigates the differences in atenolol pharmacokinetics following three blood collection methods: serial sampling and staggered sampling through the saphenous vein, and terminal blood sampling through cardiac puncture. Additionally, the required number of mice for each method and their potential impact on intra-individual variation are summarized.

In a pharmacokinetic study with 8 sampling time points, 6 mice were using the serial bleeding method, 12 mice were using the staggered bleeding method, and 48 mice were using terminal blood sampling. At our WuXi AppTec DMPK Rodent PK facility, we handle a regular animal throughput of approximately 10,000 per month. Among these, regular procedures including simple administration, experimental durations of less than 24 hours, and blood collection alone account for about 50% of the total. For the mice used with serial bleeding methods, the total number was 500. However, with staggered bleeding, the number of mice required increases to 1,000 (a doubling in quantity), and for terminal blood sampling, the number of mice needed increases by 8 times. During the pharmacokinetic analysis, we utilized either the concentrations at different time points from the same individual or the average concentrations from different individuals. In addition, our findings demonstrate that serial mouse saphenous vein blood sampling yields the smallest standard deviation of major pharmacokinetic parameters compared to the other two methods, indicating its superiority in obtaining consistent results.

THE IMMUNE MODULATING EFFECTS OF HYPOTHERMIA IN RATS

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Rodents are commonly used as preclinical models in biomedical research. Most models require induction of general anesthesia, which frequently results in hypothermia and potentially affects preclinical infection studies' outcomes. This study aimed to evaluate the impact of peri-anesthetic hypothermia on the immune response in rats.

Thirteen rats were included in this cross-over study. General anesthesia was induced and maintained with sevoflurane inhalation for 40 minutes, and each rat underwent a normothermic and hypothermic (<35°C) event. White blood cell counts and cytokines levels were measured at the start and end of anesthesia and at 1, 3, and 5 days and compared employing one-way repeated measures MANOVA. The study group had a significant impact on these combined outcomes (p=0.001), and an interaction effect was observed between the groups and time points (p=0.011).

Particularly, hypothermic events induced an increase in IL-6 at timepoints preanesthesia (p=0.006), and 5 days (p=0.007) and IFN at 1 day (p=0.002), 3 days (p=0.011) and 5 days (p=0.001). Subsequent analysis, accounting for baseline values, showed a significant difference in IL-6 across all timepoints (p=0.001, 0.005, <0.001 and <0.001) and KC/GRO at the end of anesthesia (p=0.017), 1 day and 3 days (p<0.001), and IL-1b at 5 days (p=0.009).

The data corroborate the concept that rats' immune response is affected by abnormal body temperature during general anesthesia and underscore the need for temperature management during preclinical studies to prevent data variability and improve experimental reproducibility.

RESULTS OF INTRODUCTION OF DVC® ON CDP FACILITY MANAGEMENT

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Introduction: The Central Animal Facility (CDP) of the University Medical Center Groningen (UMCG), the Netherlands, started using DVC® as a replacement for Individual Ventilated Cages and conventional cages. The motivation for this decision was threefold: laboratory animal and human health and welfare, cost efficiency in animal caretaking and added value to scientific research. This presentation will focus on the aspect of cost efficiency in mouse caretaking. Key feature of DVC® is the continuous assessment of bedding condition in order to optimise cage change intervals based on real moisture content.

Aim: The aim of this project was to identify quantitative and qualitative effects of the use of Digital Ventilated Cages® on mouse facility management.

Materials and methods: The DVC®-system (Tecniplast) was introduced in CDP in 2022. Initially, it became fully operational in one of the mouse breeding areas of the facility. Cage changes were counted for twelve months. This number was compared with the number of cage changes that would have been made using the previous cage change procedure.

Results and Conclusion: In 2023 a total number of 25.732 DVC cage changes were performed. Under previous housing procedures this would have resulted in 51.190 IVC cage changes. Given a bedding volume of 125-150 gram per cage, over 3.000 kg bedding material was saved in 2023. As a consequence, cage washing and autoclaving decreased substantially. Potential additional benefits of fewer cage handlings may be less animal welfare issues because of the lower number of disturbances and a decrease of ergonomic issues.

ANATOMICAL EXPLORATION OF THE SPRAGUE DAWLEY RAT HIND FOOT

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Introduction

Rats as laboratory animals have long played a crucial role in advancing scientific research, contributing significantly to our comprehension of various diseases. The striking structural similarity between the hind foot of rats and the intricate anatomy of the human hand has centered the attention to these animals. However, a comprehensive anatomical exploration of the adult rat foot has been conspicuously absent from scientific literature.

Aims and Methods

To fill this void, our study examined the hind feet of 42 adult male Sprague Dawley (SD) rats, each weighing between 300 to 350 grams. Employing a multifaceted approach, we conducted statistical analyses of foot dimensions, measured unilateral hind limb, grasping strength with a digital dynamometer, assessed joint mobility, described the hind limb skeletal architecture via microcomputed tomography (mCT) and the histological picture.

Results and conclusion

This research provides important information about the structure and function of the adult SD rat hind foot, enhancing its usefulness in various research areas. Additionally, it highlights interesting similarities between the rat's hind foot and the human hand, suggesting new possibilities for understanding hand anatomy and function.

OBJECTIVE METRICS FOR SEVERITY ASSESSMENT FOLLOWING SUBARACHNOID HEMORRHAGE IN A RAT MODEL

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The European Union Directive 2010/63/EU mandates the assessment and reduction of severity in animal experimentation. The most commonly used clinical scoring system for severity assessment is mainly based on subjective parameters, which can lead to high inter-rater variability. However, objective, validated and reliable tests for severity assessment are lacking. This study aims to identify objective, metric tests for assessing severity following subarachnoid hemorrhage (SAH). Male Wistar rats were used to induce SAH through the cisterna magna blood injection model. The rats were divided into groups based on the volume of blood injected: sham (n=25), mild SAH induced by 200µl over 10 minutes (n=23), and moderate SAH induced by 300µl over 1 minute (n=28). A naïve group (n=5) was also included. Clinical scoring, behavioral testing (including tests indicative for wellbeing), and fecal corticosteroid metabolite (FCM) analysis were performed at baseline and for up to 10 days after SAH induction.Significant changes were observed in body weight, clinical score, voluntary wheel running, open field activity, burrowing behavior, balance beam performance, neuroscore, and FCM levels, indicating varying degrees of severity among the different experimental groups.Our results describe a first approach to objectively assess severity after subarachnoid hemorrhage. The applied tests provide a useful tool for complying with the EU directive and enhancing animal welfare in experimental research. Data from other neurological animal models will allow further advanced analyses with the aim of identifying the best combinations of tests and comparative classification of severity.Supported by Deutsche Forschungsgemeinschaft (FOR2591, LI588/5-1 and -2)

THE USE OF ANTIBIOTIC IMMERSION FOR THE TREATMENT OF FIGHT WOUNDS IN XENOPUS LAEVIS FROGS

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Introduction and objectives

The African clawed frog (Xenopus laevis) has served as a research model for many years. Nevertheless, there remains a notable lack of literature on proper management and care protocols. Existing therapeutic strategies, including the use of antibiotics, are often based on extrapolations from recommendations for other species. In this clinical case, we assessed the effectiveness of antibiotic baths in a frog that needed to be treated for skin wounds.

Materials and methods

Identification and photographic monitoring of lesions.

Individualized housing in a static aquarium isolated from the main system to reduce stress and aggression, facilitate feed intake and prevent endangering the biological filter.

7 days of 24-hour baths in a solution of gentamicin sulfate (8µg/ml; target species: swine). A broad-spectrum antibiotic was used to target gram-negative bacteria, as these are the most frequently isolated from amphibian skin wounds.

Results

No adverse reactions or abnormal behavior were observed during or after treatment. An improvement in the appearance of the wounds was observed from the first bath and the wounds were completely healed by the end of the treatment. Both interdigital membranes showed signs of healing 7 days after treatment and were completely regenerated 36 days after initiating the treatment.

Conclusions

Gentamicin sulfate could be considered a therapeutical option to treat skin wounds in Xenopus laevis, not only because of its efficacy, but also because it is safe and practical to use, not requiring the immobilization of the animal.

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