ENRICH Fish workshop
Bergen/Tromsø, 22-23 February 2017

What can Norecopa do for fish researchers?

Adrian Smith

adrian.smith@norecopa.no

norecopa.no

enrich-fish.net

National Consensus Platform for the Replacement, Reduction and Refinement of Animal Experiments

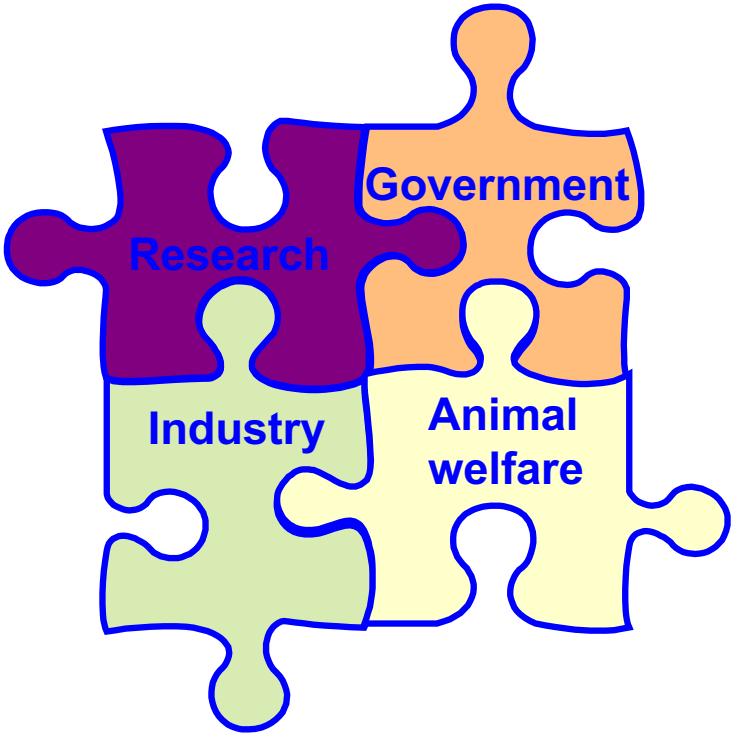
a database of global 3R resources:
over 6,000 pages with over 20,000 unique links

Norecopa is a member of ***ecopa***

European Consensus-Platform for Alternatives

www.ecopa.eu

ecopa supports the establishment of National Consensus Platforms (NCPs) where all 4 stakeholders are equally represented:



nature International weekly journal of science

NATURE | NEWS

Missing mice: gaps in data plague animal research

Reports of hundreds of biomedical experiments lack essential information.

Monya Baker

05 January 2016

Two studies have unveiled widespread flaws in the reporting of animal experiments — the latest in a series of papers to criticize shoddy biomedical research.

Whereas reports of clinical trials in major medical journals routinely state how many patients die or drop out of analysis during the course of a study, animal studies generally fail to report this figure — or drop animals without saying why, according to a team led by Ulrich Dirnagl at the Charité Medical University in Berlin. That lapse could significantly bias results, the team reports in the journal *PLoS Biology*[1].

In a second study in the same journal[2], a team led by John Ioannidis, an epidemiologist at Stanford University in California who has repeatedly called for more reproducible and transparent research, criticizes the lack of data availability and detailed protocols in biomedical papers.

The Board represents all 4 stakeholders:

- ***Bente Bergersen**, Norwegian Food Safety Authority, chairperson*
  deputy: Johan Teige, Norwegian Food Safety Authority
- ***Siri Knudsen**, University of Tromsø*
  deputy: Aurora Brønstad, University of Bergen
- ***Glenn Arve Sundnes**, Blom Fiskeoppdrett*
  deputy: Børge N. Fredriksen, Pharmaq AS
- ***Anton Krag**, Norwegian Animal Protection Alliance*
  deputy: Harald Small, Norwegian Society for Protection of Animals

Representation on other committees/fora:

- *Board of the Danish 3R Centre*
- *Danish National Committee*
- *Education & Training Platform (ETP-LAS) in Europe*
- *AALAS-FELASA working group on Harm-Benefit Analysis*

International consensus meetings

Harmonisation of the Care and Use of:

- *Fish (2005)*
- *Wildlife (2008)*
- *Fish (2009)*
- *Agricultural animals (2012)*
- *Wildlife (26-27 October 2017)*

http://norecopa.no/consensus-meetings

All presentations and consensus statements are on the internet: a lasting resource

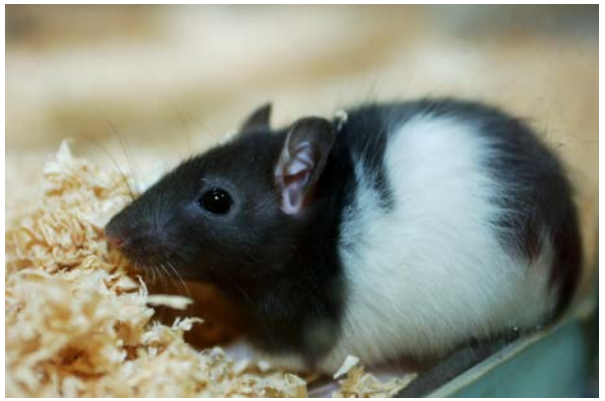
FRAME Training School
in Norway,

1 – 3 February 2016

TRAINING SCHOOL IN EXPERIMENTAL DESIGN & STATISTICAL ANALYSIS OF BIOMEDICAL EXPERIMENTS

Joining Information

norecopa.no/other-resources/experimental-design-and-reporting



Systematic Reviews and Harm-Benefit Assessment, Voss, 27 – 28 May 2015

norecopa.no/other-resources/harm-benefit-assessment

norecopa.no/other-resources/literature-searches-and-systematic-reviews

photos: colourbox.com

World Congresses on Animal Use in the Life Sciences and Alternatives

Important 3R-drivers and disseminators of information:

wc9prague.org (2014)*

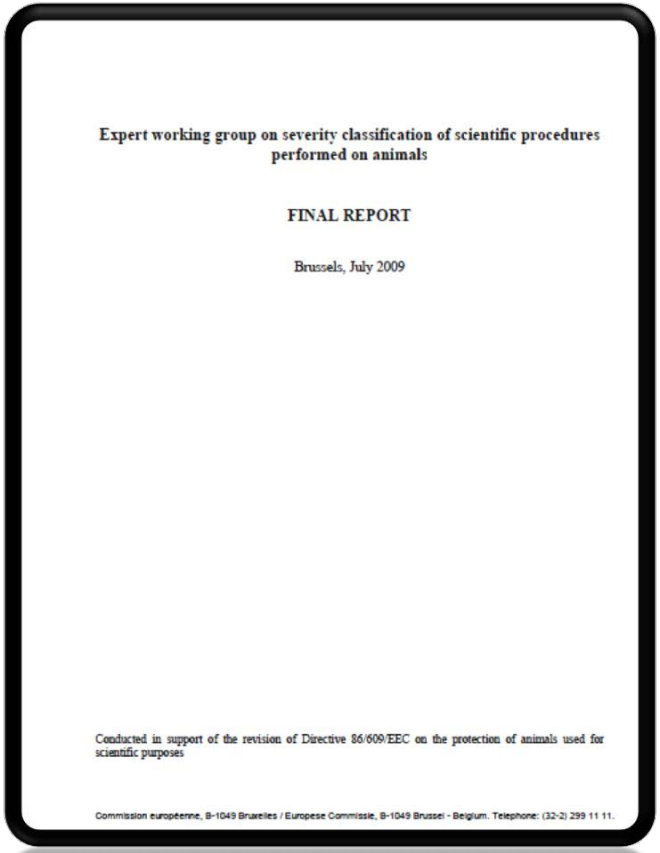
891 abstracts, 49 countries, 1000 participants

the next one is in August 2017 in Seattle:

wc10seattle.org

**Abstract book:*

http://www.altex.ch/ALTEX-Proceedings/Current-Proceedings.97.html



European Commission

ENVIRONMENT

European Commission > Environment > Chemicals > Animals used for scientific purposes

Expert Working Group report on severity classification

http://ec.europa.eu/environment/chemicals/lab_animals/pdf/report_ewg.pdf

Published online on 9 May 2011 Lab Anim, doi: 10.1258/la.2011.010181

Working Party Report

Guidance on the severity classification of scientific procedures involving fish: report of a Working Group appointed by the Norwegian Consensus-Platform for the Replacement, Reduction and Refinement of animal experiments (Norecopa)

P Hawkins (Convenor)[1], N Dennison[2], G Goodman[3], S Hetherington[4], S Llywelyn-Jones[5], K Ryder[2] and A J Smith[6]

[1]Research Animals Department, RSPCA, Wilberforce Way, Southwater, West Sussex RH13 9RS, UK; [2]Animals (Scientific Procedures) Inspectorate, Home Office, PO Box 6779, Dundee DD1 9WW, UK; [3]Biological Services, The University of Edinburgh, Chancellor Building, 49, Little France Crescent, Edinburgh EH16 4SB, UK; [4]CEFAS, Pakefield Road, Lowestoft, NR33 0HT, UK; [5]King's College London, Biological Services Unit, 4th floor, Hodgkin Building, Guy's Campus, London SE1 1UL, UK; [6]Norecopa, c/o Norwegian Veterinary Institute, PO Box 750 Sentrum, N-0106 Oslo, Norway
Corresponding author: P Hawkins. Email: phawkins@rspca.org.uk

Abstract

The severity classification of procedures using animals is an important tool to help focus the implementation of refinement and to assist in reporting the application of the 3Rs (replacement, reduction and refinement). The recently revised Directive that regulates animal research and testing within the European Union requires Member States to ensure that all procedures are classified as 'non-recovery', 'mild', 'moderate' or 'severe', using assignment criteria set out by the European Commission (EC). However, these are focused upon terrestrial species, so are of limited relevance to fish users. A Working Group set up by the Norwegian Consensus-Platform for the 3Rs (Norecopa) has produced guidance on the classification of severity in scientific procedures involving fish, including examples of 'subthreshold', 'mild', 'moderate', 'severe' and 'upper threshold' procedures. The aims are to complement the EC guidelines and help to ensure that suffering in fish is effectively predicted and minimized. Norecopa has established a website (www.norecopa.no/categories) where more information on severity classification for procedures using fish, including field research, will be made available.

Keywords: Fish, harm–benefit assessment, humane endpoints, refinement, severity

Laboratory Animals 2011; 1–6. DOI: 10.1258/la.2011.010181

Background

An effective prediction of the effects of a research protocol on the animals concerned helps to ensure that any pain, suffering or distress they may experience will be effectively anticipated, recognized and alleviated. This is essential not only for animal welfare but also for scientific validity, because physiological and behavioural responses to suffering can significantly affect data quality. Severity classification is thus an important tool to help focus the implementation of refinement, including monitoring its progress, and to assist in reporting the application of the 3Rs (replacement, reduction and refinement) of Russell and Burch,[1] which is now an integral part of the legislation on animal research and testing in many countries. Predictions of severity are also fundamental to the harm–benefit assessments undertaken by bodies such as regulatory authorities and ethical committees when deciding whether or not a project should be licensed or funded.

There may also be a legal requirement to predict and classify severity. For example, the new Directive regulating animal use within the European Union, which must be implemented within all Member States by January 2013, requires the severity of each procedure to be classified on the basis of the 'degree of pain, suffering, distress or lasting harm expected to be experienced by an individual animal during the course of the procedure', with the aim of enhancing transparency, facilitating the project authorization process and providing tools for monitoring compliance.[2] Member States will have to ensure that all procedures are classified as 'non-recovery', 'mild', 'moderate' or 'severe' on a case-by-case basis, using the assignment

Guidance on the severity classification of procedures involving fish

Report from a Working Group
convened by Norecopa

Designed to be a supplement to the EU Working Group report on the same subject, which most relevant for traditional lab animals
(http://ec.europa.eu/environment/chemicals/lab_animals/pdf/report_ewg.pdf)

P Hawkins, N Dennison, G Goodman, S Hetherington,
S Llywelyn-Jones, K Ryder and AJ Smith

Laboratory Animals, 45: 219-224, 2011

www.norecopa.no/categories

Position Statements and Guidelines

REVIEW ARTICLE

Guidelines for health and welfare monitoring of fish used in research

R Johansen[1], J R Needham[1,2], D J Colquhoun[3], T T Poppe[4] and A J Smith[1]

[1]Norwegian School of Veterinary Science, Laboratory Animal Unit, PO Box 8146 Dep., 0033 Oslo, Norway; [2]The Microbiology Laboratories, North Harrow, Middlesex HA2 7RE, UK; [3]Section of Fish Health, National Veterinary Institute, PO Box 8156 Dep., 0033 Oslo, Norway; [4]Department of Basic Sciences and Aquatic Medicine, Norwegian School of Veterinary Science, PO Box 8146 Dep., 0033 Oslo, Norway

Summary

The aim of this paper is to provide background material necessary for the development of international guidelines for the health and welfare monitoring of fish used in research. It provides an overview of present guidelines and discusses why more detailed and species-specific guidelines are needed. A major issue within fish research is to document the situation today and point out areas where improvements are needed.

Keywords Fish; health; welfare; monitoring; guidelines

We need species-specific guidelines (as we have for mammals).
In many cases we also need situation-specific guidelines.

Position Statements and Guidelines

Divisjon for innovasjon

Forskningsbehov innen dyrevelferd i Norge

Rapport fra styringsgruppen

Norges forskningsråd

Statens landbruksforvaltning

fhf

2005: http://www.forskningsradet.no/csstorage/flex_attachment/82-02156-4%20dyrevelferd.pdf

Position Statements and Guidelines

- Food deprivation
- Toe clipping
- Pain relief
- Fin clipping of fish
- Biometric methods of identification
- Methods for identification of birds

Use of in vivo tests in the development and testing of fish vaccines

Norecopa arranged a working group meeting in March 2016 with all Norway's vaccine companies

The group produced an anonymous consensus document with suggestions on how to increase implementation of the 3Rs

Norecopa's annual general meetings and seminar:

Adamstua, 24 May 2016:

1000 - 1045: Annual General Meeting

1050 - 1110: Norecopa's 3R-prize: nominees and winner

1115 - 1200: ***Putting tags and transmitters in birds: are our guidelines flights of fantasy?*** Professor Rory Wilson, Swansea University

1200 - 1230: Buffet lunch

1230 - 1315: ***How to construct a proper literature search when planning an experiment*** Information Specialist Alice Tillema, Radboud University, Nijmegen

1330 - 1530: Practical training in literature searching

Next meeting: 7 June 2017 at Adamstua, Oslo

Integrating natural science and technology:

Fish and fish robots

centre for biorobotics

www.biorobotics.ttu.ee

Prof. Maarja Kruusma

Collaboration with animal welfare organisations

RSPCA ONLINE

AND ADVICE 0300 123

Campaigns

Animal Care

SEARCH
ABOUT THE RSPCA
ADVICE CENTRE
NEWS
CAMPAIGNS
GOOD BUSINESS AWARDS
ANIMAL CARE
REHOMING
HOW YOU CAN HELP
EDUCATION
SCIENCE GROUP
FREEDOM FOOD
LOCAL RSPCA
RSPCA INTERNATIONAL
PUBLICATIONS
CAREERS
UNDER 8TEENZ

RSPCA PET INSURANCE

My RSPCA
Help

Reducing suffering - Rabbit welfare

back to research animals home

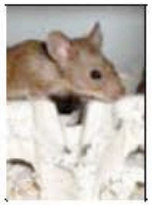
Thousands of rabbits are used in research and testing throughout the European Union every year, mostly in pharmaceutical research and development. The lives of laboratory rabbits can be greatly improved by providing housing and care that caters for their physical and behavioural needs.

UFAW/RSPCA Rabbit Behaviour and Welfare Group

During 2008, the UFAW/RSPCA Rabbit Behaviour and Welfare Group published a report providing practical guidance on refining laboratory rabbit husbandry

Reducing suffering: introduction
For as long as animals are used in research and testing, every step must be taken to reduce suffering and improve welfare...
more

Refinement
The research animals department promotes initiatives that will lead to improvements in laboratory animal housing and care and reductions in suffering caused by procedures...
more



Rodent welfare
Working to improve the welfare of laboratory rodents is extremely important because the vast majority of animals used in research and testing are mice and rats...
more

Rabbit welfare
The lives of laboratory rabbits can be greatly improved by providing housing and care that caters for their physical and behavioural needs...
more

www.rspca.org.uk/sciencegroup/researchanimals

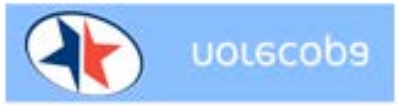
Guidance on the housing and care of Zebrafish

Danio rerio

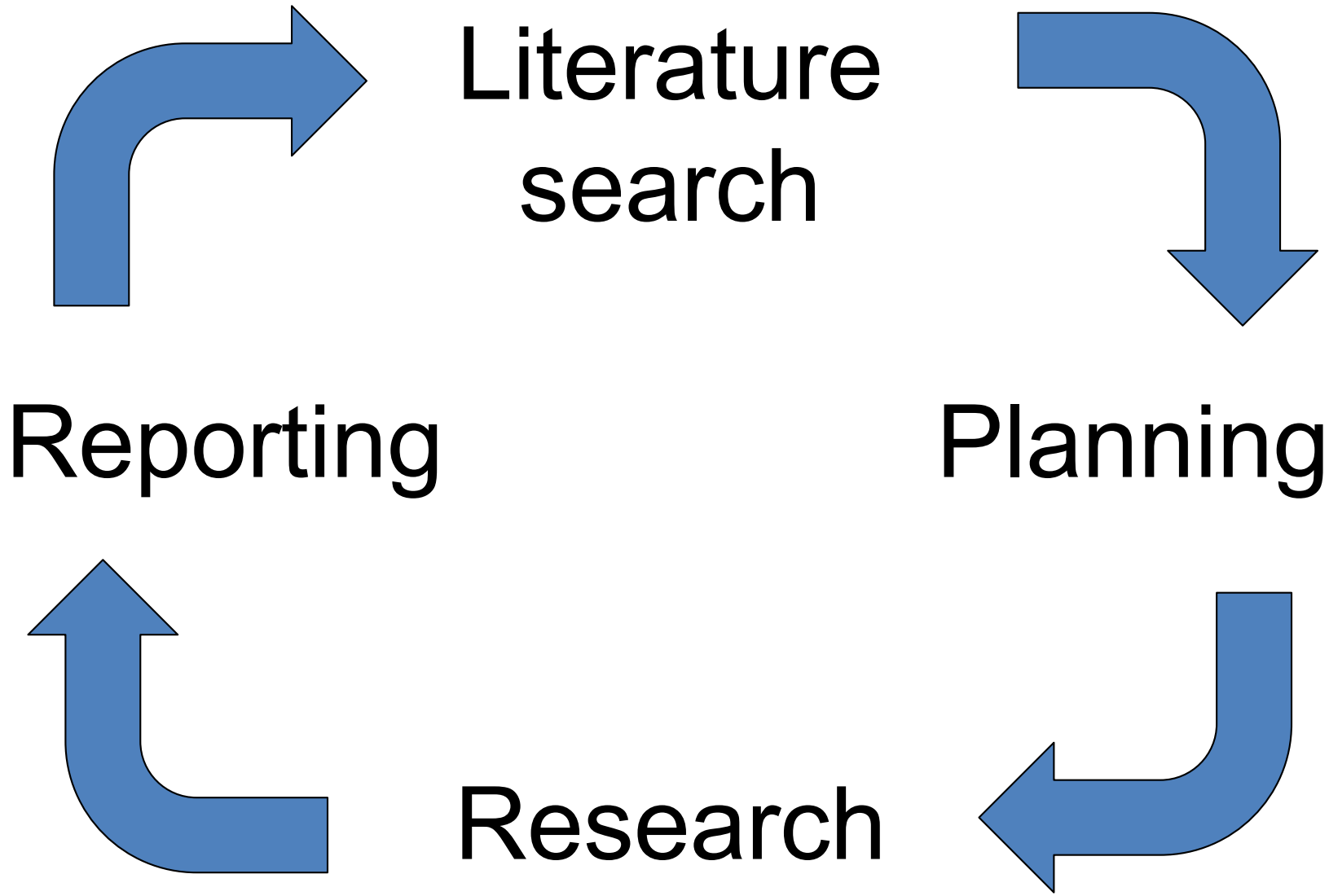
Barney Reed & Maggy Jennings
Research Animals Department, Science Group, RSPCA

Compendium in Laboratory Animal Science for Fish Researchers

edited by
Trond Brattelid & Adrian J. Smith

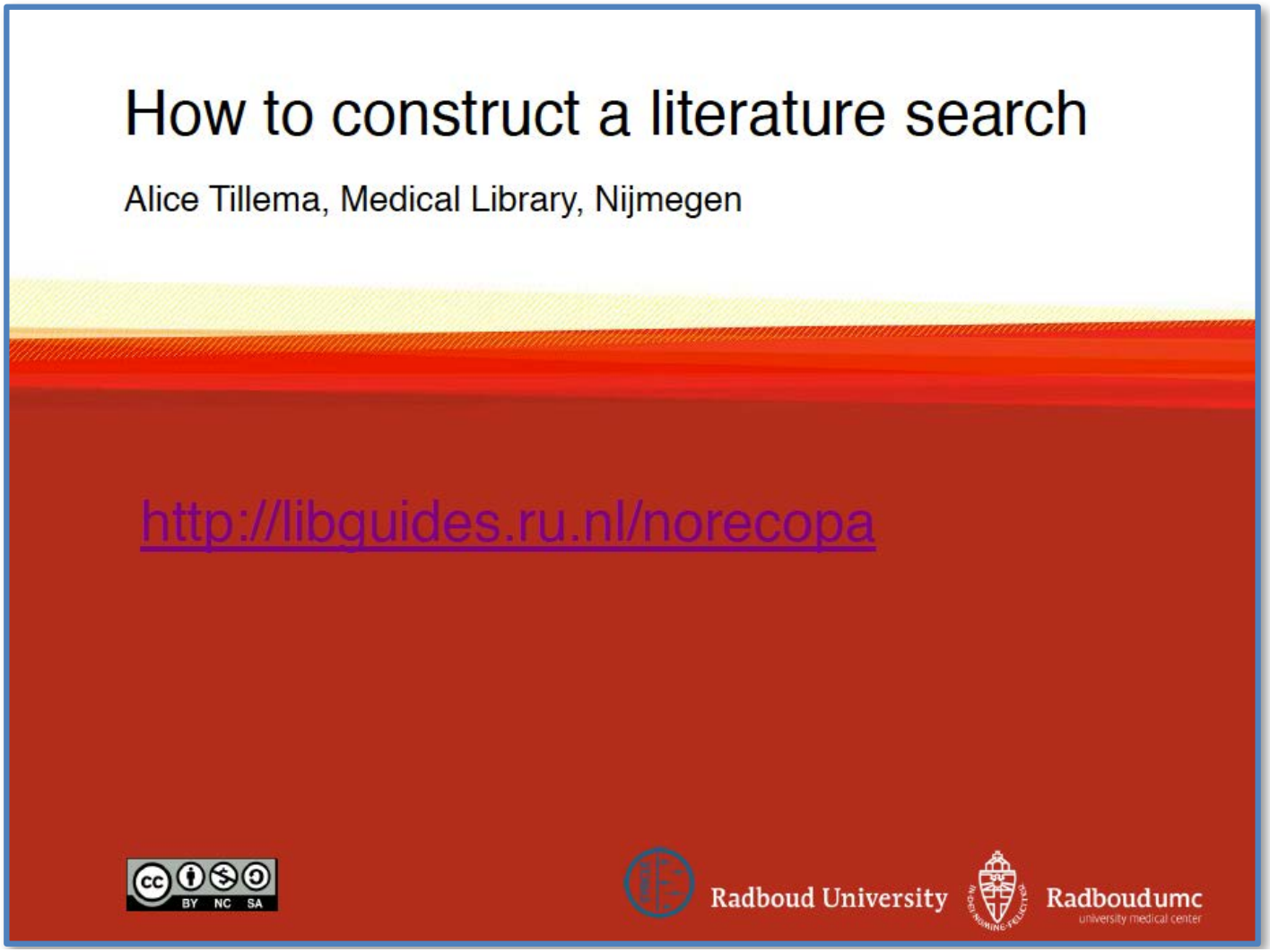


Norwegian School of Veterinary Science
& Norecopa
June 2011


Literature search
Planning
Research
Reporting

Alice Tillema, Radboud University:
How to construct a literature search

http://norecopa.no/how-to-construct-a-literature-search.pdf



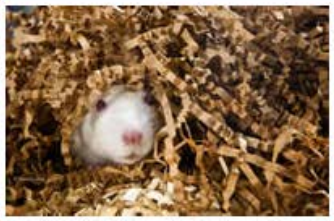
ec.europa.eu/animals-in-science

European Commission

ENVIRONMENT

European Commission > Environment > Chemicals > Animals used for scientific purposes

Home | About us | Policies | Funding | Legal compliance | News & outreac



Animals used for scientific purposes

Retrieval and provision of information on the "Three Rs" and alternatives

Accessing accurate, relevant and up-to-date information on the Three Rs is a challenge for all those use of animals.

- Legislation and implementation
  - EU legislative framework
  - Implementation of Directive 2010/63/EU
    - Q&A and guidance documents
- The "Three Rs" and alternative approaches
  - Replacement, Reduction and Refinement – the "Three Rs"
  - Validation, acceptance and use
  - EU activities to advance alternatives
  - Member State activities to advance alternatives
  - Finding and distributing information on alternatives
  - Key resources
    - Search Tools
    - Databases
    - Portals and web-sites
    - Journals
    - Other resources and organisations

Animals used for scientific purposes

Opinions of European Commission Expert Committees related to the use of animals in experiments

Why is 3R literature hard to find?

- Bibliographic databases are often not used adequately (poor overlapping between the databases)
- Too few scientists are aware of the specialist 3R-databases
- Scientists rarely use ”3R” words when they write titles/abstracts/keywords for their papers
- Databases rarely flag 3R-papers with explicit thesaurus terms ☹
- We have no single ”Journal of Alternatives”

The title and abstract are critical, because they are often the only parts that are indexed. They must be informative and contain 3R-terms!

The development of Response Surface Pathway Design in toxicity studies

The development of Response Surface Pathway Design to reduce animal numbers in toxicity studies

Saphenous vein puncture for

blood sampling of the mouse, rat, hamster,

gerbil, guinea-pig,

ferret and mink

Visibility! Not necessarily in a high-impact journal.

Methods of positioning fish for surgery or other procedures out of water

Trond Brattelid & Adrian J. Smith

Laboratory Animal Unit, Norwegian School of Veterinary Science, PO Box 8146 Dep., N-0033 Oslo, Norway

Lateral thinking between species

Laboratory Animals, 2000, 34, 430-433

”Simple” techniques?

Photo: T. Poppe, NMBU

http://blogs.discovermagazine.com/notrocketscience/2011/01/12/flipper-bands-impair-penguin-survival-and-breeding-success/#.VLU6_8Y7_wo

Photo: NMBU

Refinement to avoid **contingent suffering**

(not just direct suffering caused by the procedure)

e.g. fear, boredom, discomfort

which may caused by

e.g. transport, housing, husbandry, social hierarchy

The Lonely Mouse

Single-housed male mice show symptoms of what in humans would be characterised as depression

http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0111065

photo: colourbox.com

Taperfiskene er stresset, apatiske og anorektiske

IDA BEITNES JOHANSEN | ØYVIND ØVERLI | MARCO VINDAS
OPPDATERT: 05.JAN.2017 12:31 | PUBLISERT: 04.JAN.2017 21:30

aftenposten.no

Brain serotonergic activation in growth-stunted farmed salmon: adaption versus pathology

Marco A. Vindas, Ida B. Johansen, Ole Folkedal, Erik Höglund, Marnix Gorissen, Gert Flik, Tore S. Kristiansen, Øyvind Øverli

Published 25 May 2016. DOI: 10.1098/rsos.160030

photos: Ole Folkedal

An useful additional (but largely unknown) tool…

Carol M. Newton (1925-2014)

National Library of Medicine

The three S's

- *Good Science*
- *Good Sense**
- *Good Sensibilities**

**We can do this ourselves without scientific literature!*

Carol M Newton, quoted in Rowsell HC (1977): The Ethics of Biomedical Experimentation in The Future of Animals, Cells, Models, and Systems in Research, Development, Education, and Testing pp. 267-281, National Academy of Sciences, Washington, D.C., ISBN 0-309-02603-2.

Smith AJ & Hawkins P: Good Science, Good Sense and Good Sensibilities: The Three Ss of Carol Newton Submitted to *Animals*, August 2016.

https://norecopa.no/alternatives/culture-of-care

NC 3Rs National Centre for the Replacement Refinement & Reduction of Animals in Research

The 3Rs | Our science | 3Rs resources | Funding

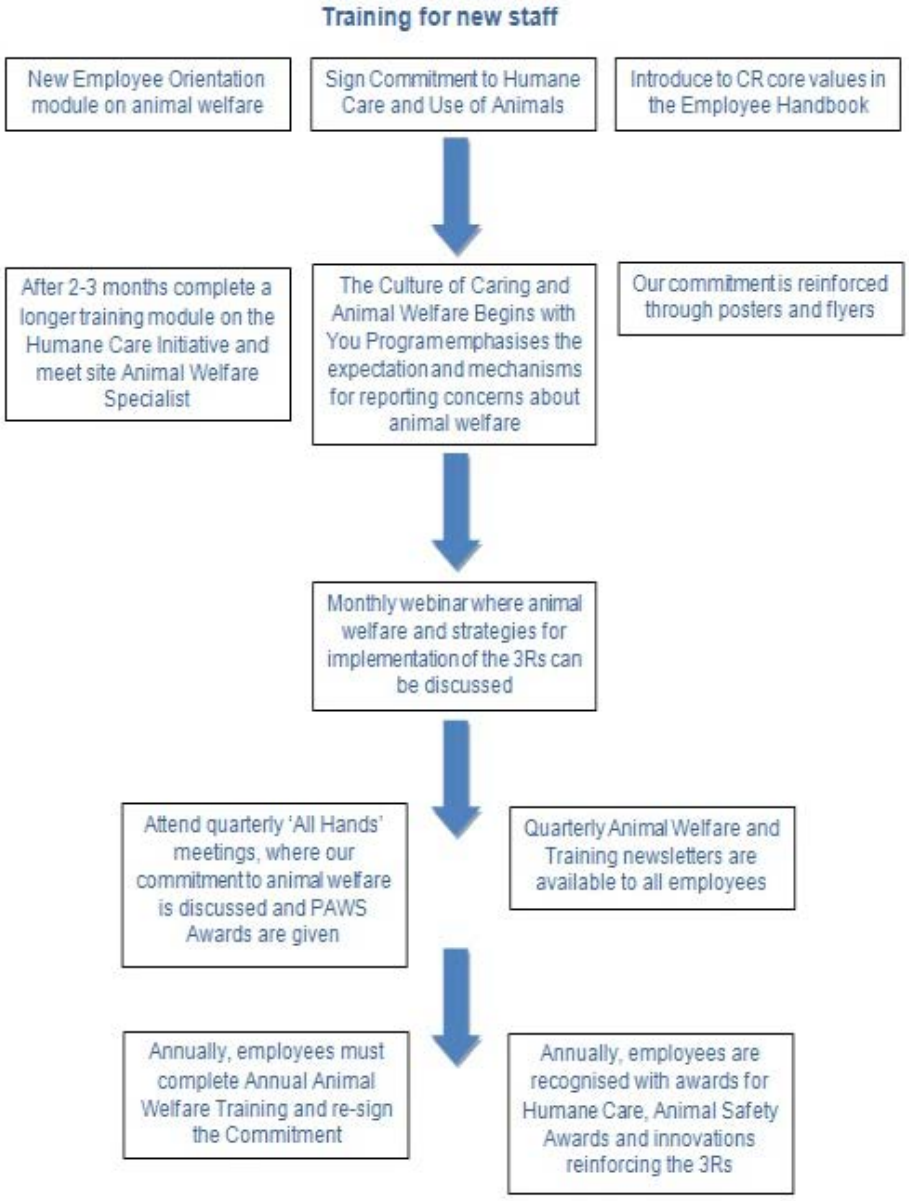
Home > News > Blog > Creating a culture of care

Creating a culture of care

Friday 22 August 2014

Dr Marilyn Brown, Corporate Vice President of Global Animal Welfare at the contract research organisation Charles River, has many years of experience managing experimental facilities and animal care programmes.

https://www.nc3rs.org.uk/news/creating-culture-care



ILAR JOURNAL

Establishing a Culture of Care, Conscience, and Responsibility: Addressing the Improvement of Scientific Discovery and Animal Welfare Through Science-based Performance Standards

H. J. Klein and K. A. Bayne
Address correspondence and reprint requests to Dr. Klein, Merck Research Laboratories, WP42-211, West Point, PA 19486, or email Hilton_klein@merck.com.

http://ilarjournal.oxfordjournals.org/content/48/1/3.full

New planning guidelines: PREPARE

***P**lanning **R**esearch involving **E**xperimental **P**rocedures on **A**nimals: **R**ecommendations for **E**xcellence*

- Complementary to reporting guidelines such as ARRIVE
- Cover all aspects (not just those which are reported), including **checklists** for
  - management of the animal facility
  - all the practical details of an animal experiment from acquisition of the animals to waste disposal
  - division of labour and responsibilities between the facility and research group
  - submitted to an Open Access journal

norecopa.no/PREPARE


NORSK ENGLISH
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Legislation
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Search all Norecopa's databases and webpages simultaneously:
Add search term
Welcome to Norecopa's new website!
Search engine help file
More about Norecopa's databases: 3R Guide - NORINA - TextBase - Classic AVs

norecopa.no

Webpages plus:

3R Guide

www.3RGuide.info

Databases, Guidelines, Regulations, Information Centres, Journals, E-mail lists

Audiovisual products

Textbooks

NORINA

oslovet.norecopa.no/NORINA

TextBase

oslovet.norecopa.no/textbase

Norecopa's Videos

29 Videos | 0 Appearances | 29 Total

Sort: Date | Alphabetical | Plays | Likes | Comments | Duration

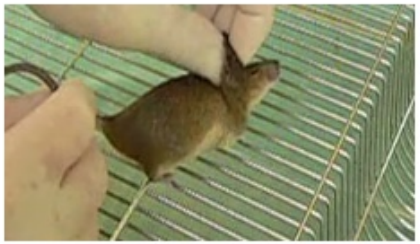
Blood sampling of the rat from the saphe...
8 months ago

Handling rats: keep them warm
8 months ago

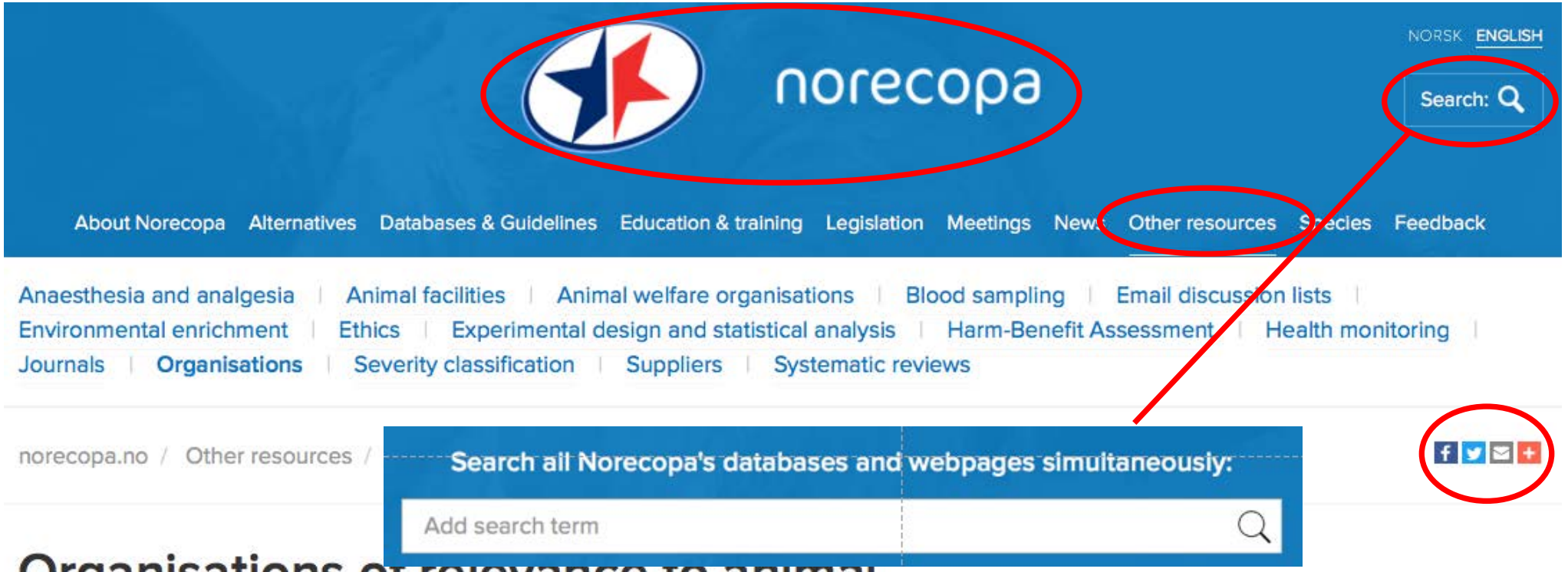
Immobilisation of the mouse for intraperi...
1 year ago

Cardiac puncture in the terminally anaest...
1 year ago

Pedal reflex in the rabbit
1 year ago



Immobilisation of the mouse
1 year ago



Organisations of relevance to animal research

Organisations within Laboratory Animal Science

AAALAC International (Association for Assessment and Accreditation of Laboratory Animal Care International)
AALAS (American Association for Laboratory Animal Science)
ACLAM (American College of Laboratory Animal Medicine)
AniMatch (an online sharing platform for the exchange of organs and tissues)
ARSAL (Asociatia Româna pentru Stiinta Animalelor de Laborator; Romanian Laboratory Animal Science Association)
ASLAP (American Society of Laboratory Animal Practitioners)

Animals in research:


Fish


Farm animals


Laboratory animals


Wildlife and wild fish


Cephalopods


Other aquatic animals

Norecopa promotes use of "The Three Rs":

Replace
Replacement of animal experiments with alternatives

Reduce
Reduction of the number of animals used in experiments

Refine
Reduction of pain and suffering in animal experiments

Norecopa aims for consensus between the four stakeholders:

Government and Regulatory Authorities - Research and teaching - Industry - Animal protection and welfare

Position Statements and Guidelines

Alternatives | Anaesthesia and analgesia | Behaviour | Education and training | Environmental enrichment | Guidelines | Handling | Health monitoring and disease prevention | Humane killing | Legislation | Marking and identification | Meetings | Organisations | Pain and suffering | Projects | Reports | Sampling | Surgery | **Welfare** | Zebrafish

norecopa.no / Fish / Welfare

Fish welfare

- Guidelines for health and welfare monitoring of fish used in research
- On-farm evaluation of the Salmon Welfare Index Model (SWIM 1.0): theoretical and practical considerations
- Huntingford et al. 2006 "Current issues in fish welfare"
- The EU-WEALTH project aims to gain an in-depth understanding of factors affecting welfare and health of farmed fish

Contact oss

+47 41 22 09 49
post@norecopa.no

Norecopa on Facebook

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0454 Oslo

Postal address

% Norwegian Veterinary Institute
P.O. Box 750 Sentrum
N-0106 Oslo, Norway

Org.no. 992 199 199
Bank account: 7694 05 12030
(IBAN: NO51 7694 0512 030)
(payment must be marked '12025 Norecopa')

Shortcuts

- Give us some feedback!
- 2010/63/EU
- Information material
- Norecopa's Board
- Secretariat
- Sponsors
- Cookies & Privacy
- Site map

Resources developed in collaboration with:

Norges miljø- og biovitenskapelige universitet

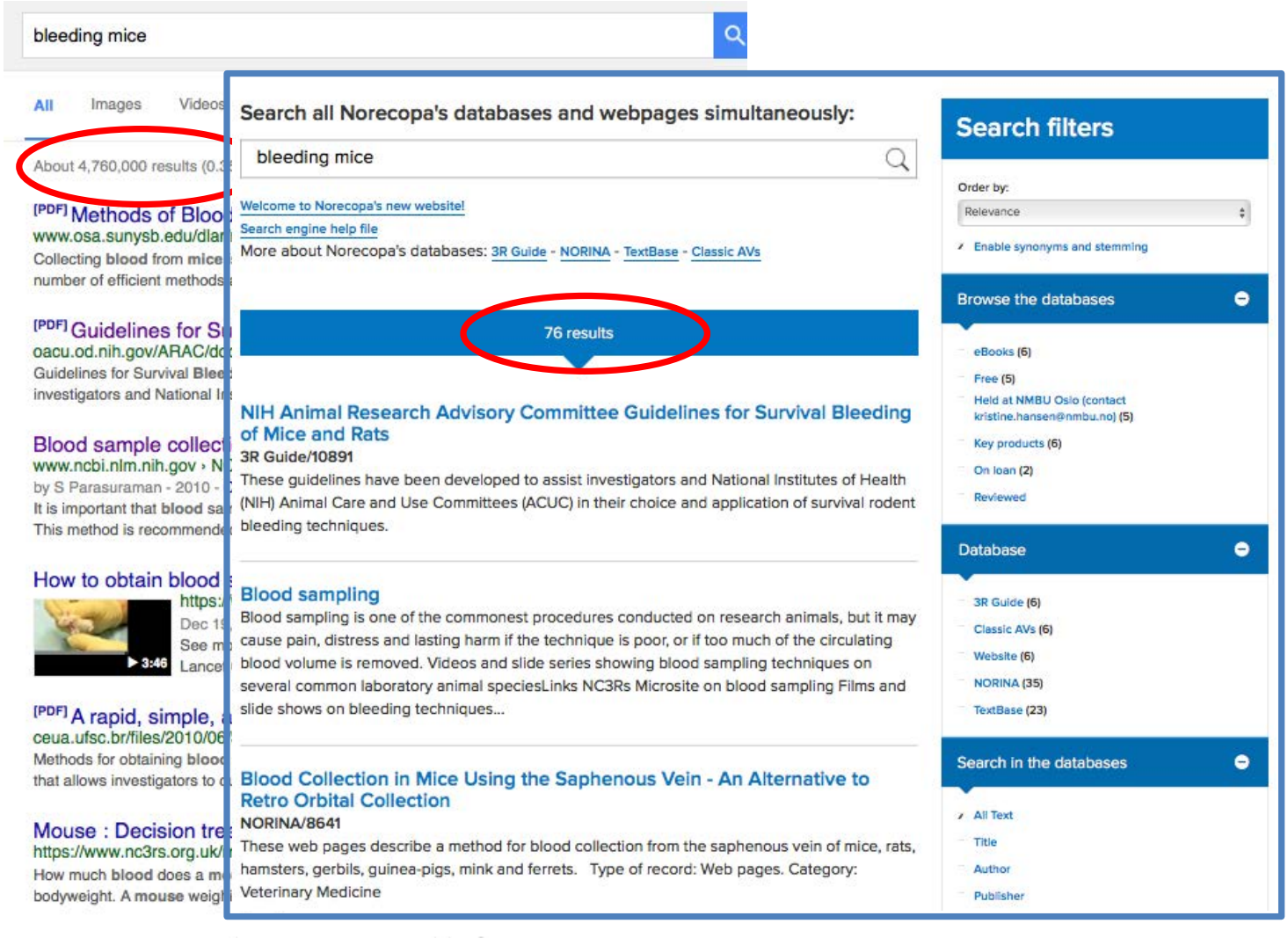
USDA U.S. Department of Agriculture

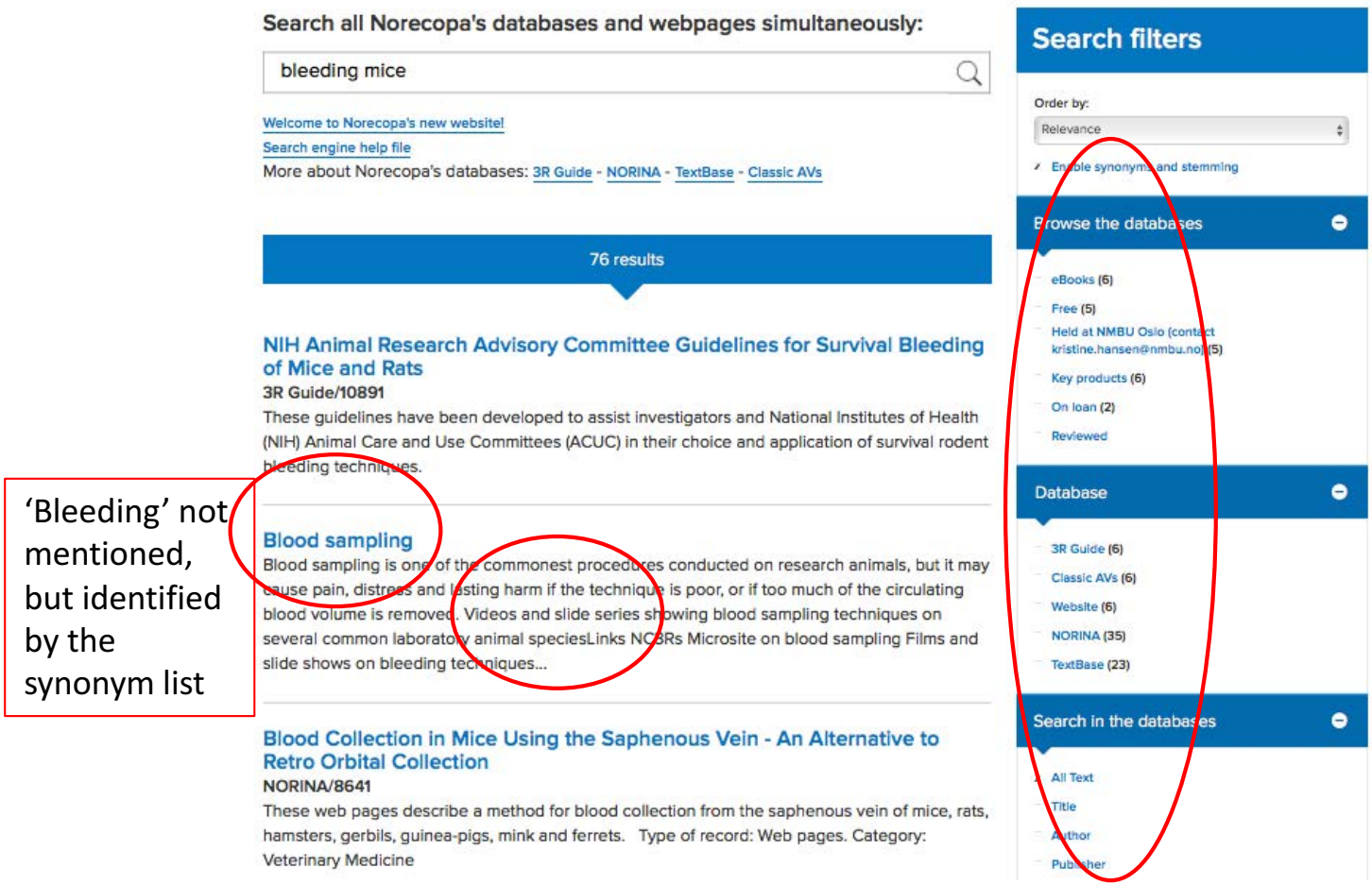
Subscribe to our newsletter

Your email addres: Register

- Browse our latest newsletters

Search for ‘bleeding mice’ on Google and Norecopa.

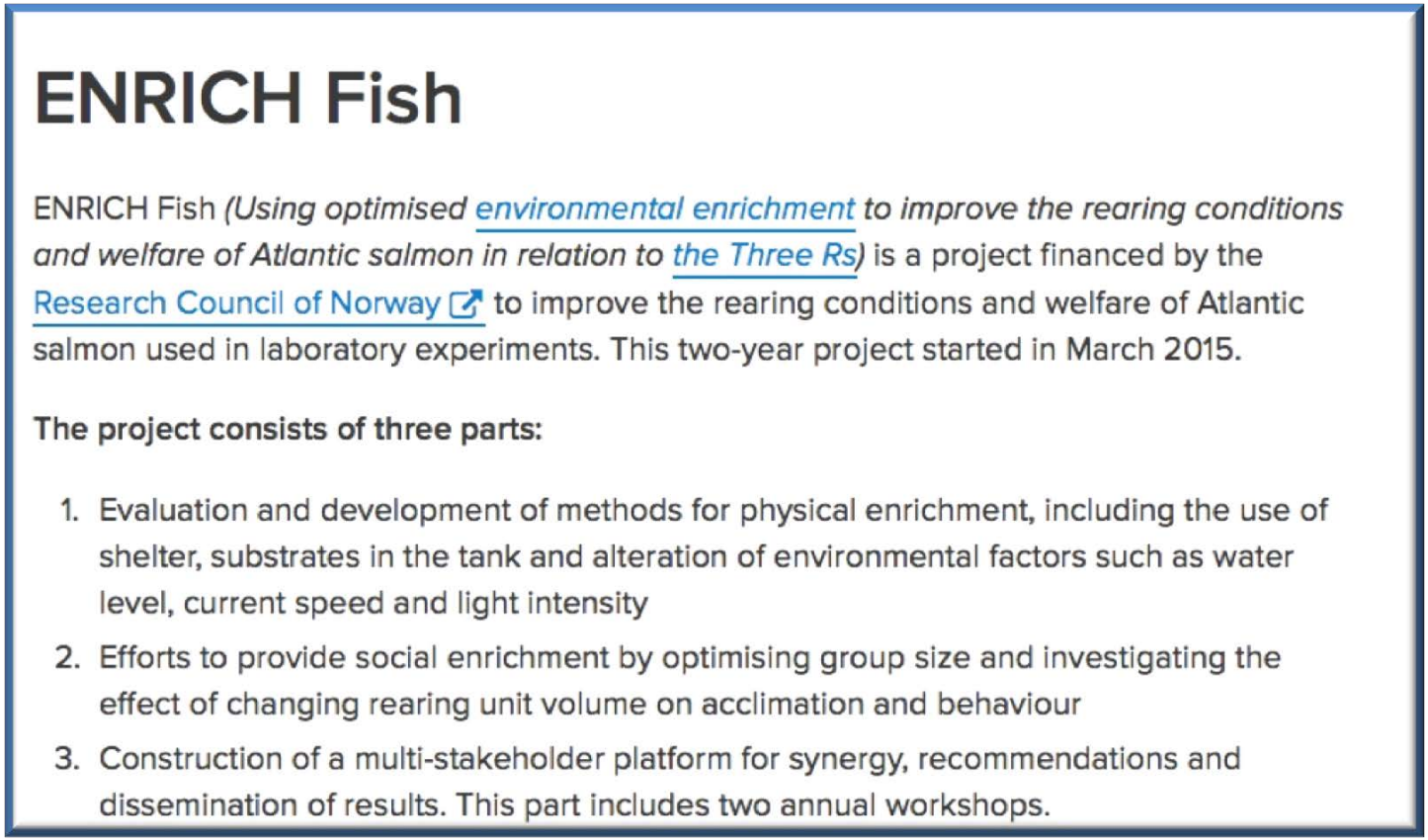




'Bleeding' not mentioned, but identified by the synonym list

ENRICH Fish website

enrich-fish.net



ENRICH Fish

ENRICH Fish *(Using optimised environmental enrichment to improve the rearing conditions and welfare of Atlantic salmon in relation to the Three Rs)* is a project financed by the Research Council of Norway to improve the rearing conditions and welfare of Atlantic salmon used in laboratory experiments. This two-year project started in March 2015.

The project consists of three parts:

1. Evaluation and development of methods for physical enrichment, including the use of shelter, substrates in the tank and alteration of environmental factors such as water level, current speed and light intensity
2. Efforts to provide social enrichment by optimising group size and investigating the effect of changing rearing unit volume on acclimation and behaviour
3. Construction of a multi-stakeholder platform for synergy, recommendations and dissemination of results. This part includes two annual workshops.

Presentations from the seminars, results, links to other resources

Norecopa's 3R prize

(30,000 kroner + diploma)

Deadline for nominations: 15 March

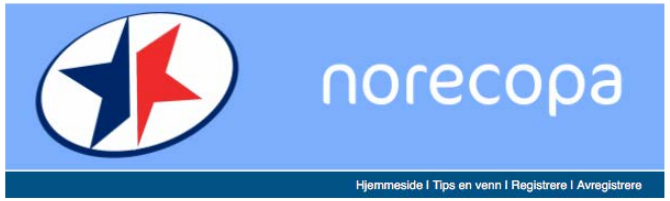
Newsletter 7-8 times a year

- something for you?

facebook.com/norecopa

post@norecopa.no

@norecopa



Dette brevet inneholder følgende saker:

- Nå er det på tide å nominere til 3R-prisen!
- Nye nettsider for Norecopa
- Arbeidsseminar om design og statistikk
- Frist for sammendrag til FELASA
- Nettbasert kurs om sebrafisk
- Ny modul om dyrevelferd fra Newcastle
- Forbedring av fiskeforsøk
- Rådet for dyreetikk har fått nye medlemmer
- Nyheter fra 3R-sentre og komitéer
- UiB-nettside om 3R
- Glimt fra forskningen
- Merking av vilt
- Registrering av smerte hos sau

Thanks to our members:

- Institutions, departments
- Individuals

Thanks to our main sponsors:

- Standing Committee on Business Affairs, Norwegian Parliament
- Norwegian Ministries of Agriculture and Fisheries
- Research Council of Norway
- Laboratory Animals Ltd.
- Nordic Society Against Painful Experiments
- Novo Nordisk
- Scottish Accreditation Board
- Stiansen Foundation