

# THE 3RS OF ALTERNATIVES

## REDUCTION

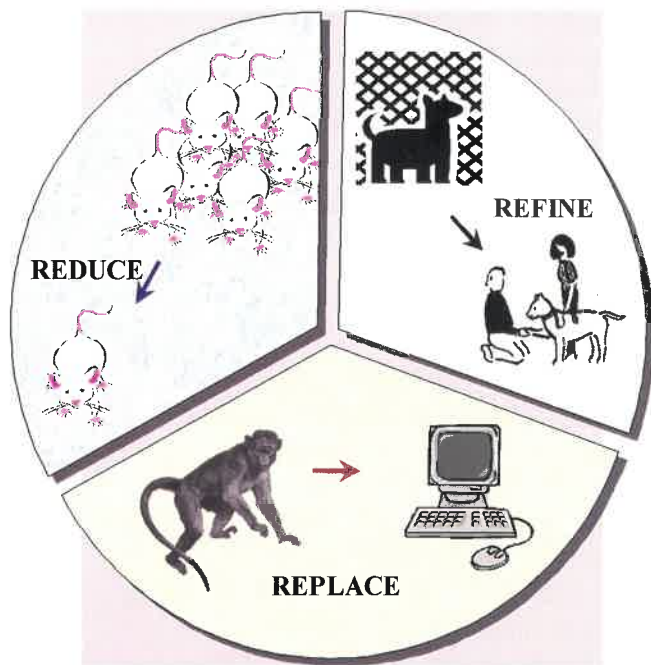
Minimize the number of animals used

## REFINEMENT

Use techniques and procedures that reduce pain and distress

## REPLACEMENT

Substitute animal models with non-animal techniques or lower organisms



Adapted from:  
 Russell, WMS and RL Burch (1959). *The Principles of Humane Experimental Technique*. Universities Federation of Animal Welfare: England, 238 p.  
[http://altweb.jhsph.edu/pubs/books/humane\\_exp/het-toc](http://altweb.jhsph.edu/pubs/books/humane_exp/het-toc)

**Step 5: Conduct the search, evaluate, modify as needed... and provide a complete animal study protocol to IACUC**

Principal Investigators (PIs) should

- 1) Complete and review the search before completing the protocol;
- 2) Assess and evaluate the alternative possibilities and be prepared to support their use or non-use in writing;
- 3) Check to make sure the terminology, search strategy, databases searched and dates of search are provided; *and*
- 4) Keep a copy of the search strategy, databases searched, and years of search for future use.

## RED FLAGS

Certain concerns may arise during IACUC review of the protocol:

- ▶ Only 1 database searched;
- ▶ Terms included only for painful aspects;
- ▶ The term "alternative" used alone;
- ▶ Keywords not relevant to the protocol;
- ▶ Keywords and concepts linked incorrectly; or
- ▶ Inadequate time period searched (< 5 years).



Questions?  
 Contact Us!



## ANIMAL WELFARE INFORMATION CENTER

U.S. Department of Agriculture  
 Agricultural Research Service  
 National Agricultural Library  
 10301 Baltimore Avenue  
 Room 410  
 Beltsville, Maryland, USA 20705

Phone: 301-504-6212  
 Fax: 301-504-7125  
 E-mail: [awic@ars.usda.gov](mailto:awic@ars.usda.gov)  
 Web site: <http://awic.nal.usda.gov>



United States Department of Agriculture  
**ANIMAL WELFARE INFORMATION CENTER**  
 National Agricultural Library

# Alternatives and the Animal Welfare Act

Congressional Record - House

17 December 1985

Senator R. Dole:



"... the farm bill contains legislation dealing with the humane treatment of animals. The main thrust of the bill is to minimize pain and distress suffered by animals used for experiments and tests. In so doing, biomedical research will gain in accuracy and humanity. We owe much to laboratory animals and that debt can best be repaid by good treatment and keeping painful experiments to a minimum."

# Conducting Literature Searches: Addressing the Search for Alternatives

## Step 1: Understand the legislation and regulatory intent

### Improved Standards for Laboratory Animals Act Food Security Act of 1985 Subtitle F, Animal Welfare, Public Law 99-198

Sec.2143 (a)(3): "...the standards...shall, with respect to animals in research facilities, include requirements-

(A) for animal care, treatment, and practices in experimental procedures to ensure that animal pain and distress are minimized...;

(B) that the principal investigator considers alternatives to any procedure likely to produce pain or distress in an experimental animals..."

### Information Requirements of the Animal Welfare Act Code of Federal Regulations Title 9, Chapter 1, Subtitle A, Animal Welfare

Sec. 2.31(d): "...the IACUC shall determine that...

(ii) The principal investigator has considered alternatives to procedures that may cause more than momentary or slight pain or distress to the animals, and has provided a written narrative description of the methods and sources, e.g. the Animal Welfare Information Center, used to determine that alternatives were not available;

(iii) The principal investigator has provided written assurance that the activities do not unnecessarily duplicate previous experiments..."



### Consideration of Alternatives to Painful/Distress Procedures USDA/APHIS/Animal Care Policy #12

"..APHIS continues to recommend a database search as the most effective and efficient method for demonstrating compliance with the requirement to consider alternatives to painful/distressful procedures."

## Step 2: Familiarize yourself with the protocol

### Gather information about :

- the area of study, including species and organ systems,
- important acronyms and international spellings,
- names of hormones, enzymes, CAS#, trade names,
- prominent authors in the field including the investigator,
- knowledge of possible alternatives, and
- previous searches, including keywords used.

## Step 3: Formulate a search strategy

### Phase 1 – Reduction and Refinement

Provides a comprehensive view of the field of study, including techniques and common species used, and may address unnecessary duplication.

#### Keyword Examples

analgesic or painkiller or sedative  
anesthesia or anaesthesia or anasthesia  
housing or facility or caging or management  
welfare or well-being or pain or distress  
technique or procedure or method or assay

### Phase 2 – Replacement

Addresses potential alternatives such as cell or tissue culture, models, simulations, animals lower on the phylogenetic scale, plants, etc.

#### Keyword Examples

vitro or culture or artificial  
tissue or cell or organ  
virtual or simulation or digital or interactive  
fish or mollusk or cephalopod

*\* Consider synonyms, alternate spellings and variations of the words (such as tenses).*

## Step 4: Select appropriate databases

In this list of databases, file numbers are included for those databases searchable in Dialog.

### Biomedical and Biological

- AGRICOLA (file 10): <http://agricola.nal.usda.gov>
- Aquatic Sciences and Fisheries Abstracts (file 44)
- BIOSIS (file 5)
- CAB (file 50)
- Current Contents (file 440)
- EMBASE (file 73)
- Life Sciences
- MEDLINE (file 155): <http://www.ncbi.nlm.nih.gov/pubmed>
- Pascal (file 144)
- PsycINFO (file 11)
- SciSearch (file 434)
- TOXLINE (file 156)
- Zoological Record (file 185)
- Scopus and ScienceDirect
- Web of Science



### Pharmaceutical and Technological

- Ei Compendex (file 8)
- Gale Group Computer Database (file 275)
- INSPEC (file 2)
- International Pharmaceutical Abstracts (file 74)
- Pharmaceutical News Index (file 42)
- Japanese Science and Technology (J-EAST): <http://sciencelinks.jp/j-east/>



### Federally-Funded Research

- CRIS: <http://cris.nifa.usda.gov>
- NIH RePORTER: <http://projectreporter.nih.gov/reporter.cfm>
- NTIS-National Technical Information Service (file 6)
- FEDRIP - Federal Research in Progress (file 266)

### Education

- ERIC (file 1): <http://www.eric.ed.gov/>
- HSVMA: <http://altd.hsvma.org/>
- EURCA: <http://www.eurca.org/>
- Norwegian Reference Centre for Laboratory Animal Science & Alternatives (NORINA)  
<http://oslovet.veths.no/NORINA>  
<http://oslovet.veths.no/teaching/materials.html>  
<http://oslovet.veths.no/textbase/>

### Law and Legislation

- GPO's Federal Digital System (FDsys): <http://www.gpo.gov/fdsys/>
- LexisNexis
- Thomas: <http://thomas.loc.gov>

### Additional Web-Based Resources

- Altweb: <http://altweb.jhsph.edu>
- Defense Technical Information Center: <http://multisearch.deepwebaccess.com/multisearch/>
- NC3Rs: <http://www.nc3rs.org.uk>
- AWI Refinements Databases: <http://awionline.org/content/refinement-databases>
- Scirus: <http://www.scirus.com>
- ICCVAM: <http://iccvam.niehs.nih.gov>
- ECVAM: <http://ecvam.jrc.ec.europa.eu/>
- See more links on AWIC's Alternatives pages: <http://awic.nal.usda.gov/alternatives>

WHAT'S NEXT? ➔