

ANIMAL WELFARE INFORMATION CENTER (AWIC)

A service of the USDA, ARS,
National Agricultural Library

MAY 27, 2021



AWA Defines Service at NAL **(7 U.S.C. 2142, Sec. 13, Subsection e)**

The Secretary shall establish an information service at the National Agricultural Library. Such service shall, in cooperation with the National Library of Medicine, provide information—

- (1) pertinent to employee training;
- (2) which could **prevent unintended duplication** of animal experimentation as determined by the needs of the research facility; and
- (3) on improved methods of animal experimentation which could--
 - (a) **reduce or replace animal use**; and
 - (b) **minimize pain and distress to animals**, such as anesthetic and analgesic procedures.

- About AWIC +
- Laws and Guidelines +
- Training +
- Alternatives Literature Searching +
- 3Rs Alternatives: Technologies and Approaches +
- Housing, Care and Welfare +
- Institutional Animal Care and Use Committees +
- Routine Procedures
- Organizations

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Animal Welfare Information Center

The **Animal Welfare Information Center (AWIC)** is mandated by the Animal Welfare Act (AWA) to provide information for improved animal care and use in research, testing, and teaching.



Animal Welfare Act (AWA)

Sets standards for the treatment of animals in research, exhibition, transport, and by dealers.

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<https://www.nal.usda.gov/awic>

- About AWIC +
- Laws and Guidelines +
- Training +
- Alternatives Literature +
- Searching

1



3Rs Alternatives: Technologies and Approaches -

Alternatives in Education:
Veterinary Medicine

Experimental Design

Funding Opportunities

2



Mandatory and Regulatory Testing -

Allergic Contact
Dermatitis Testing

Biologics and Vaccine
Testing

3



Ecotoxicity Testing

Eye Safety Testing

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Ecotoxicity Testing

Ecotoxicity Testing and the 3Rs Alternatives. Ecotoxicology is the study of how environmental pollution affects ecological entities, i.e. populations, communities or ecosystems. Government agencies regulate new chemical products and pollution from industry and agriculture, mandating toxicity tests to determine how substances effect the environment. Organizations are prioritizing the development and validation of ecotoxicity testing methods that avoid using living animals. These alternative testing methods include [in vitro](#) tests such as cell lines, bioassays, and microfluidic (“organ-on-a-chip”) devices; [in silico](#)/computer modeling and databases of animal testing data for chemical compounds; as well as [in chemico](#) analysis. Other ecotoxicity tests considered as replacement methods utilize lower organisms such as pond snails, fish embryos, or algae.

Search for Scientific Literature on 3Rs approaches to Toxicity Testing

The following resources contain scientific literature about reduction, refinement or replacement (3Rs alternatives) in ecotoxicity testing.

- [PubMed](#)
- [Google Scholar](#)
- [Pub Ag](#)

Organizations working to validate alternative methods for Ecotoxicity Testing

[Toxicity Testing in the 21st Century – A Vision and a Strategy](#)

The National Research Council was asked by the U.S. Environmental Protection Agency to review the state of the

Ecotoxicity Testing & the 3Rs Alternatives Selected Bibliography

Below is a selected bibliography of scholarly literature from 2010 to 2020 on 3Rs approaches to replace, reduce and refine animal use in ecotoxicity testing.

<https://www.nal.usda.gov/awic/ecotoxicity-testing>

Multiple 3Rs Testing Methods in Ecotoxicity

Asnauer, R., & Jager, T. (2015). Environmental effects of action across species and toxicants: The key to predictive ecotoxicology. *Environmental Toxicology and Chemistry*, 34(12), 2615–2624. <https://doi.org/10.1016/j.envto.2015.09.011>

Baderna, D., Lomazzi, E., Paolucci, S., Benfenati, E., & Fanelli, R. (2017). Mechanized tunneling. *Journal of Hazardous Materials*, 324, 1–10. <https://doi.org/10.1016/j.jhazmat.2016.12.041>

Bols, N. C., & Hermens, J. L. M. (2010). Toxicity tests. *Aquatic Toxicology*, 95(1–2), 1–10. <https://doi.org/10.1016/j.aquatox.2010.03.001>

Burden, N., Benstead, R., Clifton, R., Egmond, R., Wheeler, J. R., & others. (2017). A cross-sector approach. *Integrated Environmental Assessment and Management*, 13(1), 1–10. <https://doi.org/10.1002/ieam.1781>

Cho, S., & Yoon, J.-Y. (2017). *Biotechnology*, 45, 34–42. <https://doi.org/10.1007/s10291-017-0481-1>

Coady, K. K., Biever, R. C., DeGroot, H., Krueger, H., Levine, S. L., Maunula, L., & others. (2017). Recommendations to improve the use of animals in ecotoxicology testing. *Integrated Environmental Assessment and Management*, 13(1), 1–10. <https://doi.org/10.1002/ieam.1781>

In Vitro Methodologies

Baron, M. G., Purcell, W. M., Jackson, S. K., Owen, S. F., & Jha, A. N. (2012). Towards a more representative in vitro method for fish ecotoxicology: Morphological and biochemical characterisation of three-dimensional spheroidal hepatocytes. *Ecotoxicology (London, England)*, 21(8), 2419–2429. <https://doi.org/10.1007/s10646-012-0965-5>

Cervena, T., Vrbova, K., & others. (2017). The MucilAir™ Model to Assess the Mucosal Barrier Integrity. *Journal of Applied Toxicology*, 37(1), 1–10. <https://doi.org/10.1002/jat.3381>

Curtis, T. M., Collins, A. M., & others. (2013). Suitability of in vitro tests for the assessment of the temperature mediated effects of pesticides. *Environmental Toxicology and Chemistry*, 32(12), 2615–2624. <https://doi.org/10.1016/j.envto.2013.09.011>

Embry, M. R., Belanger, S. E., A., Norberg-King, T., & W. (2017). and risk assessment and management. *Environmental Toxicology and Chemistry*, 36(12), 2615–2624. <https://doi.org/10.1016/j.envto.2017.09.011>

In Chemico Methodologies

Trush, M., Metelytsia, L., Semenyuta, I., Kalashnikova, L., Papeykin, O., Venger, I., Tarasyuk, O., Bodachivska, L., Blagodatnyi, V., & Rogalsky, S. (2019). Reduced ecotoxicity and improved biodegradability of cationic biocides based on ester-functionalized pyridinium ionic liquids. *Environmental Science and Pollution Research International*, 26(5), 4878–4889. <https://doi.org/10.1007/s11356-018-3924-8>

In Silico Methodologies

Bell, S. M., Angrish, M. M., Wood, C. E., & Edwards, S. W. (2016). Integrating Publicly Available Data to Generate Computationally Predicted Adverse Outcome Pathways for Fatty Liver. *Toxicological Sciences: An Official Journal of the Society of Toxicology*, 150(2), 510–520. <https://doi.org/10.1093/toxsci/kfw017>



AWIC Workshop

- Laws and Guidelines +
- Training +
- Alternatives Literature -
Searching
- Workshop
- Sample Searches
- Databases
- Publishing Guidelines
- 3Rs Alternatives: +
Technologies and Approaches
- Housing, Care and Welfare +
- Institutional Animal Care and +
Use Committees
- Routine Procedures
- Organizations

AWIC Workshop & Trainings

Meeting the Information Requirements of the Animal Welfare Act

This in-person workshop is intended for the regulated community (any personnel working with animals in research, testing, or education) and is typically held at the National Agricultural Library (NAL) in Beltsville, Maryland. However, due to COVID-19, AWIC is offering this workshop through a virtual platform.

About the Workshop

The regulations of the AWA require that investigators submit a protocol to the Institutional Animal Care and Use Committee (IACUCs) with documentation demonstrating that the use of animals does not cause momentary pain or distress to the animals and that the use of animals does not duplicate previous experiments. A thorough review of the protocol is required to ensure that an alternative is any procedure which utilizes techniques, or replacement of animals.

The objectives of the workshop are to

March
25, 2021

May
6, 2021

October
6-7, 2021

Customizable Workshops/Training

Free resource available upon request.

Specific topics include:

Information Requirements of the Animal Welfare Act

History of the Animal Welfare Act

3Rs alternatives/Resources

Conducting a literature search

Animal Welfare Information Center



AWIC Online Workshop

To Register: <http://bit.ly/2ZLkAtd>



Online Animal Welfare Workshop

This online version of the workshop provides an interactive environment where participants can learn about conducting literature searches, the history of animal welfare law and the specific responsibilities of researchers and IACUCs.

Combining the expertise of the AWIC staff and the flexibility of self-paced learning, the online workshop meets the needs of researchers, librarians and IACUC members nationwide.

What You'll Cover

- A historical overview of the Animal Welfare Act (AWA), and regulations
- What is meant by the Information requirements of the Animal Welfare Act (AWA).
- 3Rs Alternatives of Reduction, Refinement, and Replacement
- Databases and resources available to access scientific literature
- A systematic approach to accessing information and creating effective literature search strategies.

What is the 3Rs Alternatives Concept?

The 3Rs are synonymous with the



The 3Rs refer to the **Reduction**, **Refinement**, and **Replacement** of animal use in research, testing, and teaching. The concept was developed by Russell and Burch in their book titled, *Principles of Humane Experimental Research*, which focuses on performing humane animal research.

The **Animal Welfare Information Center** provides resources that demonstrate various methods of animal experimentation, and (b) minimize pain and distress to the animals.

Learn more about AWIC's mission and [methods](#).

AWIC Helps You PREPARE For Better Science



Featured photo by: GettyImages

Current concerns about reproducibility in preclinical research and animal studies properly. Sometimes, finding this high-quality information can help with identifying the right resources! AWIC provides [literature](#) and resources that can assist with [experimental design](#).

Among these resources are the [PREPARE guidelines](#). The PREPARE guidelines are a two-page checklist, containing essential information on how to conduct better science, optimize animal welfare, and the translatability of animal research.

Visit the [AWIC website](#) for the latest resources on 3Rs and for additional support.

Training and Conferences

Scientists Center for Animal Welfare

December 7, 2020 - December 11, 2020

Play and Tickling Can Improve Animal Welfare



Featured photo by: NC3Rs

Changing the way you interact with animals can go a long way to improving animal welfare.

Animal handling describes how people interact with animals in their environment. In the context of animal welfare, the word Refinement can describe animal handling methods that limit pain and distress. One of the "3Rs" of animal use alternatives (the other 2 are reduction and replacement) is animal handling. Tickling is a handling method used to imitate how rats socialize with each other. Current research shows that tickling rats during procedures reduces fearful reactions to humans. Rats

AWIC links to information about rat tickling and other animal handling resources on the [Handling](#) page.

[Contact us](#) for more information about the resources AWIC provides.

Training and Conferences

AWIC Newsletter

To subscribe: <https://bit.ly/3fpSydL>

- Literature searching tips and tricks.
- New 3Rs methods.
- Current 3Rs resources.
- And more!

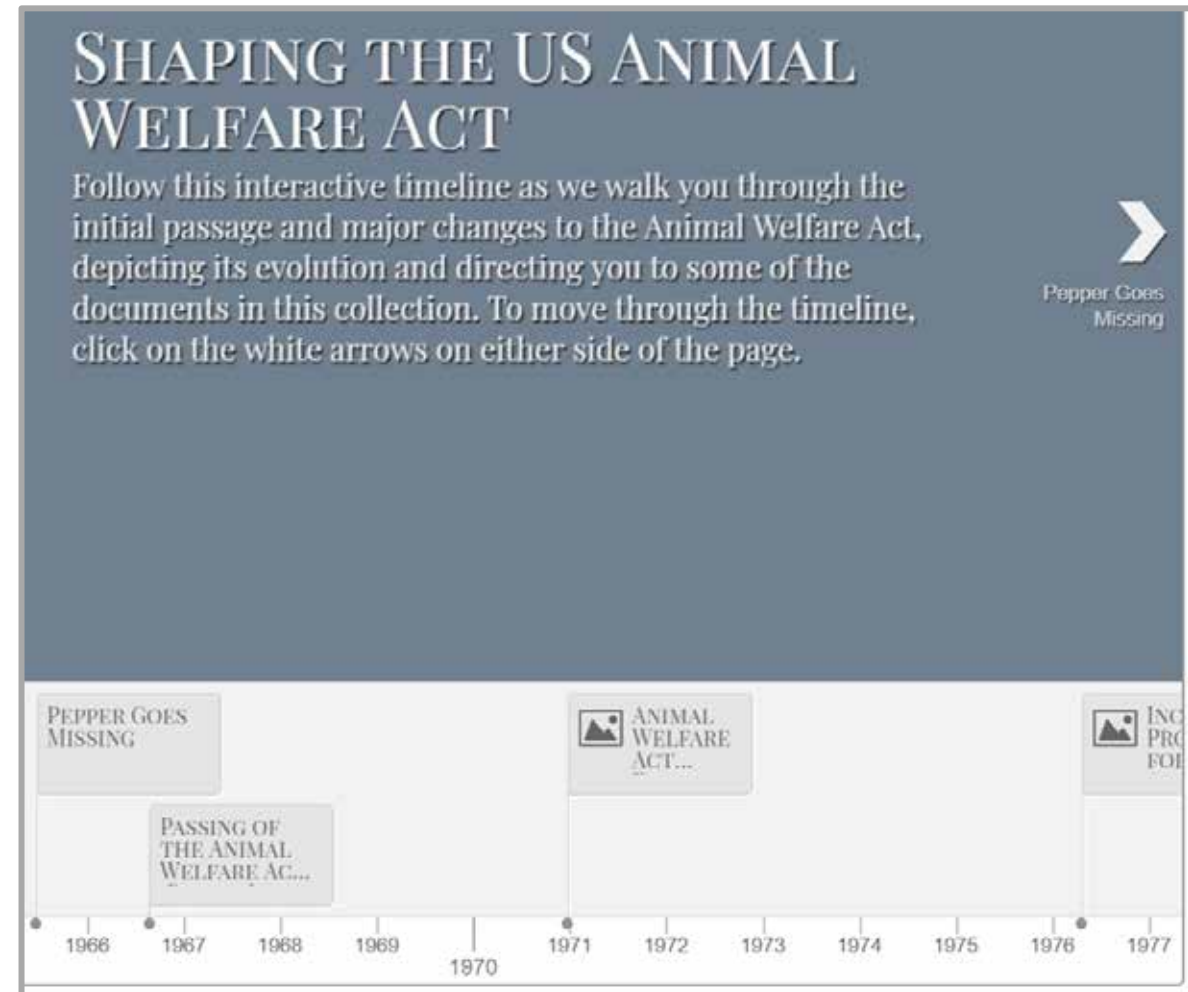
Animal Welfare Act History Digital Collection



The AWAHDC Page

<https://awahistory.nal.usda.gov/>

Not sure where to start? Begin your journey by going to the [Interactive Timeline](#)



Animal Use Alternatives Terminology

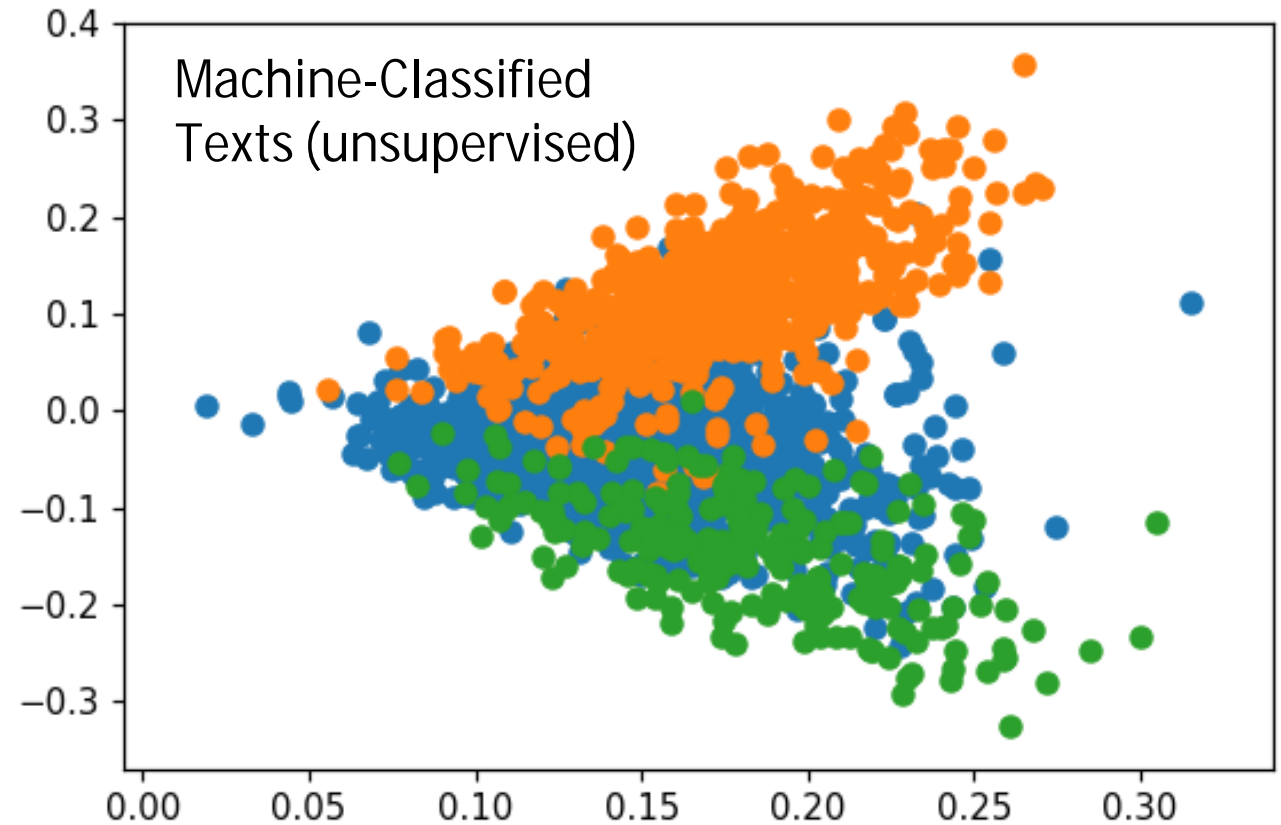
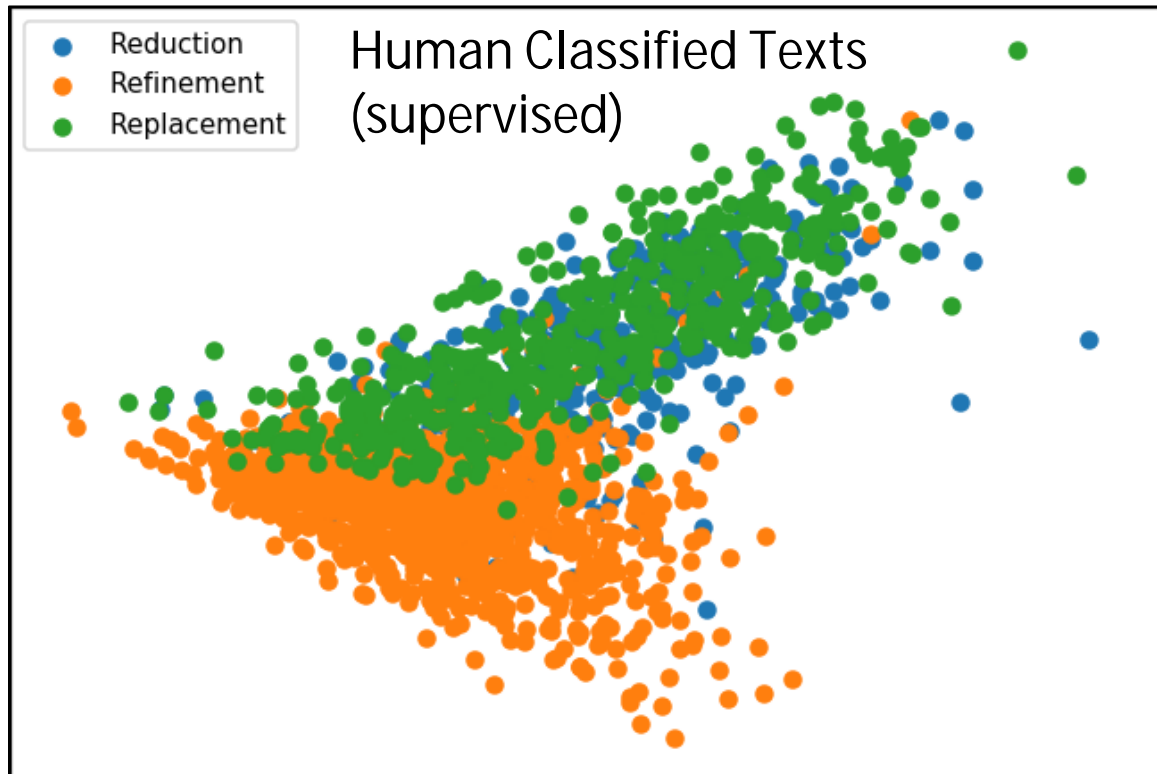
- Enhance controlled vocabulary in the NALT* for the 3Rs.
- Improve discoverability of publications on animal use alternatives.
- Improve access to peer-reviewed publications on animal use alternatives.



***National Agricultural Library Agricultural Thesaurus (NALT)**
<https://agclass.nal.usda.gov/agt.shtml>

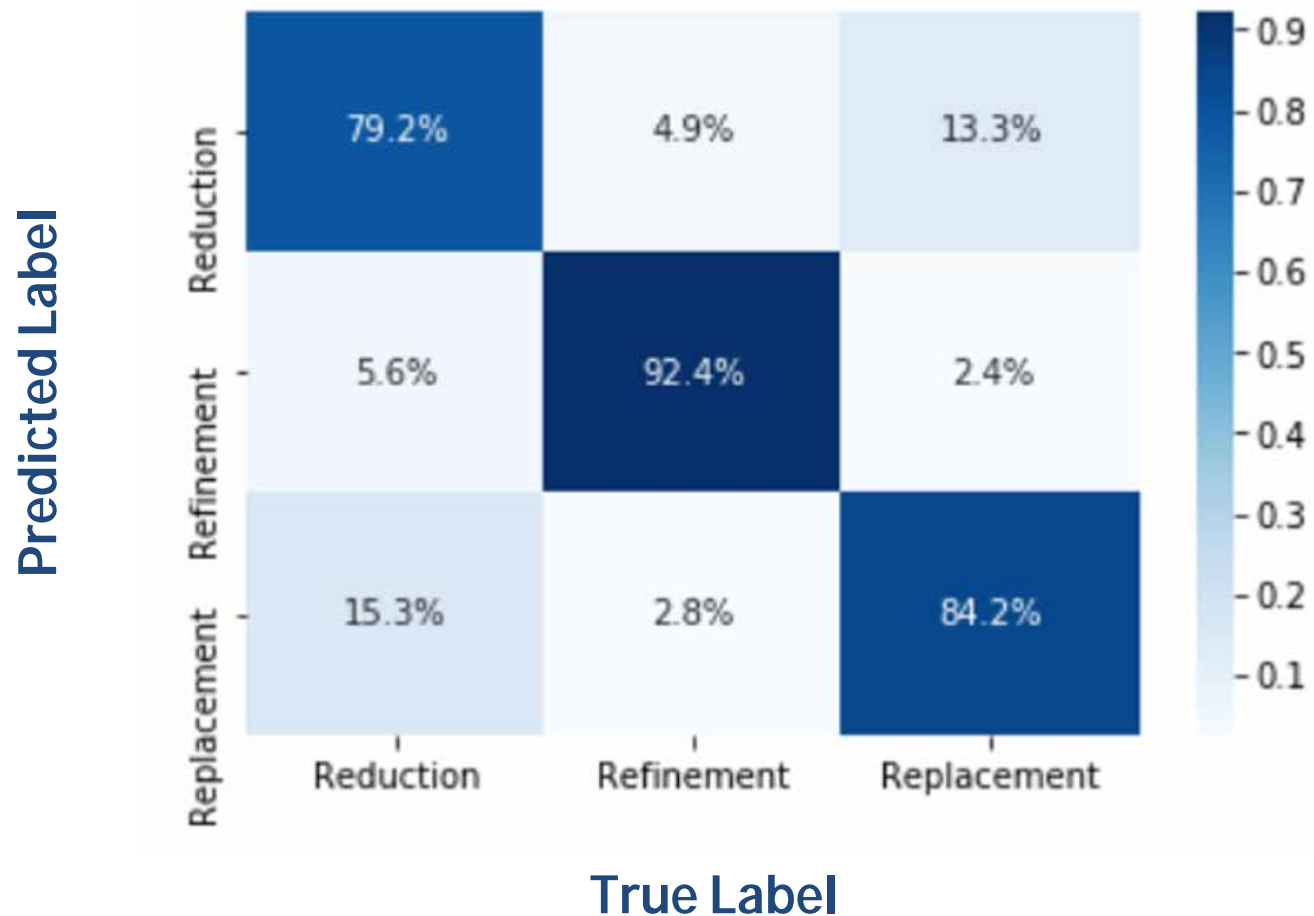
Reclustering (2D Representation)

Can a computer define more separable clusters than the 3Rs?



Challenges with the 3Rs

Ambiguity between 'Reduction' and 'Replacement'



Contacting AWIC

<https://www.nal.usda.gov/awic>

Tel (AWIC): (301) 504-6212

E-mail: awic@usda.gov

Animal Welfare Information Center
(AWIC)
National Agricultural Library
10301 Baltimore Avenue, Room 109
Beltsville, MD 20705

