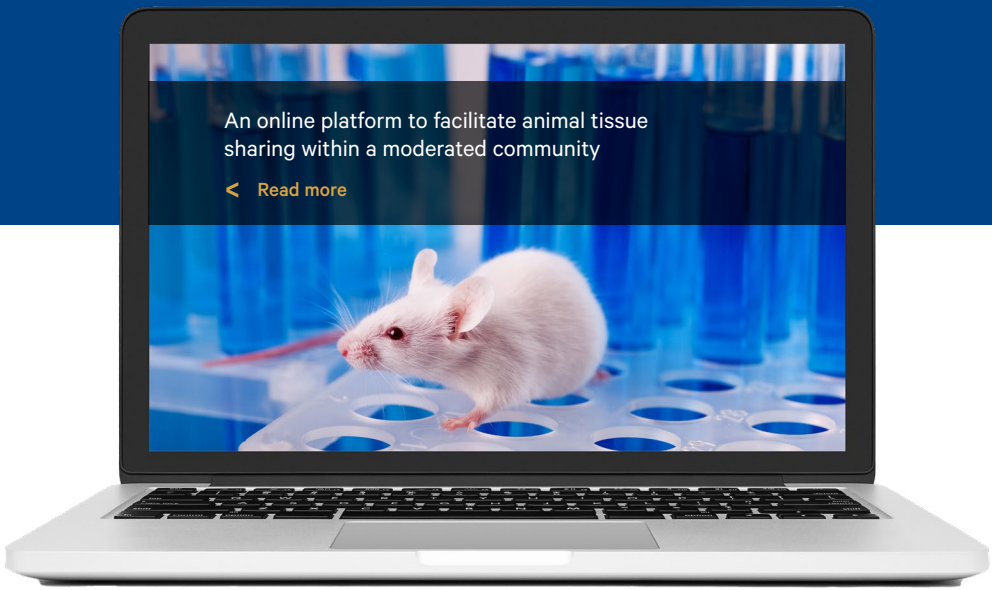
Reducing the numbers of animals used in scientific research

# Tissue Sharing

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## Reducing the numbers of animals used in scientific research

Scientists are busy developing some really exciting high-tech methods to **replace** the use of many animals in scientific research, like organs-on-a-chip. But when animal research is necessary and justified, the principles of **reduction** and **refinement** are crucial.

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**Replacement**
Where possible, replacing animal use with alternative techniques.

**Reduction**
Using the least number of animals possible while still getting useful, reliable data.

**Refinement**
Minimising harm and improving animal welfare.

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## What problems are scientists trying to solve?

Many animals are specifically bred for the use of their tissues to ask and answer research, testing and teaching questions. At the end of a research project, researchers may have intact tissues that are not needed and may be disposed of. Animals bred for research, testing or teaching may also be euthanised without ever being used[1]. These are inefficiencies that have ethical and financial costs.

[1]You can read more about animals used in research, testing and teaching in the **Statistics on the Use of Animals in Research, Testing and Teaching in New Zealand** report. These include information regarding animals that were bred for research, testing and teaching but not used, collected since 2019.

## The solution

# Tissue sharing

The Good Practice Guide for the Use of Animals in Research, Testing and Teaching recommends that surplus tissue samples from animals that have died or been humanely killed are made available to other investigators or deposited in a tissue bank.

While tissue sharing may already happen within institutions via word of mouth, these opportunities may be missed by those outside established networks.

Tissue sharing systems overcome this issue by providing researchers and teachers with the opportunity to offer or access surplus animal tissues.

Sharing platforms can be set up to ensure only persons with legitimate reasons for using animals and their tissues can access information and request to share tissues. In addition, the nature of research projects/animal use and the identities of staff and institutions are not accessible. These features give tissue donors confidence about the system's security and hence encourage participation.

Massey University has set up its own Animal Tissue Sharing website (Figure 1), which can be used as an example for other organisations to establish their own. There is work underway to open access to this website for all institutions in New Zealand.

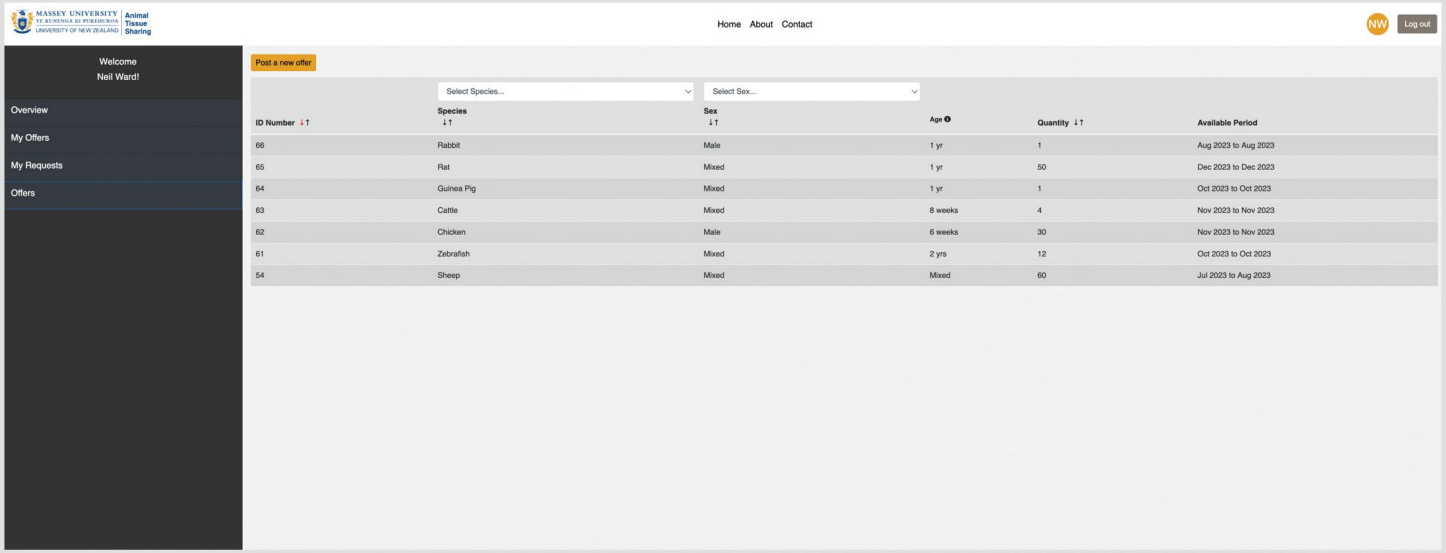


FIGURE 1 | The user screen showing offers and requests

## Advantages

- Tissue sharing reduces the number of animals used in research and teaching.
- Greater benefits from animals that are already euthanised, as more of their tissues are used.
- Tissue sharing supports networking and collaboration by sharing of expertise and resources, thereby increasing research impact.
- Pilot studies can be completed in shorter periods of time because of readily available tissue samples.
- Use of animal tissues in teaching may be considered more acceptable when animals have not been killed solely for the purpose of teaching.
- Reduces the cost of research.

## Disadvantages

- Biosecurity risks, especially where tissues are shared across country borders, may be an obstacle to tissue sharing. The recipient of tissue samples may not have control over experimental conditions prior to tissue removal or tissue storage conditions prior to sharing.
- Tissue samples may not be available when needed.
- The number of available samples may not match demand.

## References

**A guide to open science practices for animal research.**
Schmitt K., Schwedhelm P., Bert B., & Heinl C. (2022). *PLoS Biology*,15;20(9): e3001810. https://doi.org/10.1371/journal.pbio.3001810

**NAEAC Good Practice Guide for the Use of Animals in Research, Testing and Teaching.** National Animal Ethics Advisory Committee. (2022). New Zealand Ministry for Primary Industries, Wellington. Good-Practice-Guide-Jan-2022.pdf (naeac.org.nz)

Animal computer aided learning resources:
https://calshare.massey.ac.nz
virtual microscopy collection of tissue histology:
https://pathobin.massey.ac.nz

## Other tissue sharing initiatives

https://www.animatch.eu/
https://swissbiobanking.ch/
https://qpsneuro.com/ex-vivo-services/biobank/
https://iacuc.ucsf.edu/tissue-sharing-program

## For further information

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