Openness on use of animals in research, testing and teaching statistics

On Friday 27 May 2022, the Ministry for Primary Industries (MPI) released its 2020 annual statistics on the number of animals used in research, testing, and teaching (RTT) in New Zealand. Along with its detailed report, it has released an easy-to-read infographic.

The Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART) commends MPI for the openness, comprehensiveness and clarity of its 2020 annual statistics on the number of animals used in research, teaching and testing in New Zealand.

"We support the yearly release of this report, as it aligns well with the purposes of the Openness Agreement on Animal Research and Teaching in New Zealand, launched by ANZCCART in July 2021. Providing information that will enhance understanding of the nature, extent, and purpose of animal use in research, teaching and testing is crucial for informing ethical discussion about these practices," said Professor Pat Cragg, Chair of the New Zealand Board of ANZCCART.

"As more organisations sign the Openness Agreement and current signatories act on its commitments, we hope that this will accompany greater implementation of the 3Rs principles of replacement, reduction and refinement to further decrease the number of animals used and decrease the manipulation grading as seen in this 2020 report."

As part of its commitment to openness, ANZZCART has compiled some notes about the 2020 animal use statistics:

2020 Statistics for animals used in Research, Teaching and Testing released for New Zealand
- 22% decrease in animals used, compared with 2019
- Fish were the most used animal (23%)
- 78% of manipulations graded as no/virtually no or little impact

A total of 245,522 animals were reported as manipulated in 2020 (22% less than 2019), although the rolling 3-year average (2018-2020) of 287,477 (9% less than the average of 310,497 in 2019) is a better indicator of animal use due to the 3-year cycle of project reporting.

Impacts of COVID-19
Many New Zealand research facilities carried out less research than usual during the national COVID-19 lockdowns, and there may have been other effects of the lockdowns on animal use in research, teaching and testing. This means that the statistics may be lower than would be expected.

Types of animals used for research, testing, and teaching
Fish were the most used animal in RTT in 2020. Cattle, sheep, mice, and fish accounted for 79% of all animals used in RTT in 2020.

Species	Number of animals used (2020)	% of total
Cattle	46,937	19.1
Sheep	41,879	17.1
Mice	48,993	20.0
Fish	56,045	22.8
Rats	7,107	2.9
Birds	29,298	11.9
Dogs	761	0.3
Cats	351	0.1
Horses/donkeys	458	0.2
Other species	13,693	5.6
Total	245,522	

Fish were used mainly in basic biological research and animal husbandry. For example, by examining their stomach contents, fish in a coral reef were studied to see the effects of different environmental conditions. A subsequent study simulated healthy and unhealthy reef conditions in the laboratory to understand how unhealthy reefs alter fish behaviour.

Production animals such as cattle and sheep are primarily used in veterinary research, basic biological research, and teaching. They are also sometimes used as models to study diseases that affect both animals and humans. For example, Batten disease is genetic neurodegenerative disorder that causes dementia blindness and premature death in both humans and sheep. Gene therapies that have successfully treated Batten Disease in cells have also been trialled in sheep that will develop Batten Disease. Animals were treated before showing the first signs of disease and then monitored closely to check for impacts.

Mice are primarily used in medical research, basic biological research, and testing the safety and efficacy of animal health products. An example includes studying how different brain cells and their connections grow and change in response to changes in their environment, particularly how these changes may differ with neurodiversity.

Purpose of the use
Basic biological research (the study of living things and their vital processes) and veterinary research (researched aimed at improving the health and welfare of production and companion animals) accounted for nearly half of the animals used in 2020.
The main purpose for which animals were used experimentally (referred to as "manipulation" in the Animal Welfare Act) in 2020 was for basic biological research (30% of all manipulations) with 74,378 total animals used in this category. Most of these were fish, mice, sheep, cattle, rats, "other birds" and reptiles. A total of 34,632 animals were reported as used for veterinary research (14% of all manipulations) in 2020. The majority of these were cattle and sheep. The number of animals reported as being manipulated for teaching purposes (10% of all manipulations) was 25,331 in 2020. The majority of these were cattle, goats, fish and cephalopod/crustacea.

Animals were also used in environmental management (1.3%), testing (7.1%), medical research (5.9%), animal husbandry (24.9%) and species conservation (5.5%).

Impact on animals used

The pain an animal experiences during a manipulation is graded according to a five-point scale, as specified in the Animal Welfare (Records and Statistics) Regulations 1999. The five grades are:

- No impact or virtually no impact – manipulations that causes no stress or pain or virtually no stress or pain
- Little impact – manipulations of minor impact and short duration
- Moderate impact – manipulations of minor impact and long duration or moderate impact and short duration
- High impact – manipulations of moderate impact and long duration or high impact and short duration
- Very high impact – manipulations of high impact and long duration

Manipulation grade	Number of animals (2020)	% of total
No/virtually no impact	45,432	18.5
Little impact	146,082	59.5
Moderate impact	47,386	19.3
High impact	1,570	0.6
Very high impact	5,052	2.1
Total	245,522	

The proportion of manipulations graded as no/virtually no impact or little impact increased from 73% in 2019 to 78% in 2020. The proportion of manipulations graded as moderate impact decreased from 25% in 2019 to 20% in 2020. The proportion of manipulations graded as high impact or very high impact remained at 3% in 2019 and 2020.

A purpose of the Animal Welfare Act's regulation of animal use in RTT is to promote efforts to refine techniques used in any research, testing, and teaching so that the harm caused to the animals used is minimised and the benefits are maximised. It is important legally, as well as ethically, for the impact of animal use in RTT to be as low as possible in each experiment, and the percentage of research that has lower impact to increase over an appropriate time period.

Animals bred but not used in research, testing, and teaching

The total number of animals that were bred for RTT purposes but were neither manipulated or used and were subsequently killed, was 149,496. This included 21,602 rats, 105,533 mice, 1,945 guinea pigs, 142 rabbits, and 20,255 fish.

Animals bred but not used are those animals that were killed in the research setting without ever having undergone a regulated procedure. All of these animals were treated with the same duty of care as those animals used for research and teaching. This includes provision of veterinary care, dedicated animal care staff, and environmental enrichment.

During the 2020 Covid lockdowns, a number of scheduled research projects may not have started. This is because, although animal care staff were still providing essential care to support animal welfare, the researchers and animal care staff were typically unable to enter research facilities to begin new work. If a project was delayed, the animals bred for use in that project may have not been able to be used, and if they were not rehomed, they were killed without use.

Animals bred and not used are not included in the Animal Use Statistics total because they did not undergo manipulations. Information about animals bred and not used for RTT includes:

- Animals that were bred for research but could not be used. Reasons include:
  - They were the wrong sex for the research
  - They were involved in creating or maintaining genetically altered lines, but did not develop the required genetic alteration (i.e., were born without the required trait)
  - The number was over and above the numbers needed for the research study (litter sizes can be unpredictable)

- Animals used to sustain colonies with uniform or specialised genetics, ensuring adequate diversity and timely supply for RTT (this includes breeding stock and normal deaths during the neonatal period)
- 'Sentinel animals' used for health screening of other animals in the laboratory

Testing cosmetics

Testing cosmetics products, cosmetics ingredients, or household products was banned in New Zealand since 2015, and it is generally understood that prior to this ban, animals had never been used in such tests in New Zealand.

Contributing knowledge

Animal-based research contributes to our medical and veterinary knowledge, has benefits for humans, animals, and ecosystems, and is vital for teaching practical skills in life-sciences and animal welfare. In New Zealand, many large animals, birds, and fish are studied in their natural environment. Further, as long as it is safe, animals studied outside of their natural environment are returned to their flock, herd, or natural environment when the studies are concluded. Animals bred and used in the laboratory are studied alongside other techniques such as cell cultures, human studies, and computational models. These methods are used, often in tandem, to answer the key biological questions necessary to understand and treat disease.

Regulation

Animal use in RTT is strictly regulated in New Zealand, and RTT activities can only be carried out under the requirements of the Animal Welfare Act 1999. Every manipulation, from a simple blood test to major surgery, can only be carried out with prior approval of an animal ethics committee (AEC), who assess whether the potential benefits of the research outweigh the harms to the animal. The AEC must also consider whether a suitable alternative exists as part of their role in promoting the Three Rs (*Replacing* animals with non-living or non-sentient alternatives; *Reducing* the number of animals used to the minimum necessary; and *Refining* techniques to minimise pain or distress and increase positive animal welfare). Before an animal is used, the AEC must be satisfied that the knowledge could not be acquired using non-animal methods. The rehoming of animals should be considered where and when possible and be in the best interest of the animals.

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Notes to Editors

For further information, please contact: ANZCCART (NZ): anzccart@royalsociety.org.nz

The hashtag for social media is **#NZAnimalStats**.

Openness Agreement on Animal Research and Teaching in New Zealand
The New Zealand Board of the Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART), a Committee of the Royal Society Te Apārangi, has supported the development of an [Openness Agreement on Animal Research and Teaching for New Zealand](). The Agreement sets out five Commitments that require signatories to take steps to be more open about the use of animals in research and teaching:

- Commitment 1: We will be clear about why and how we use animals in research and teaching.
- Commitment 2: We will enhance our communications with the media and the public about our use of animals in research and teaching.
- Commitment 3: We will enhance our communications with tangata whenua about our use of animals in research and teaching.
- Commitment 4: We will be proactive in providing opportunities for the public to find out about research and teaching using animals.
- Commitment 5: We will report on progress annually and share our experiences.

Animal Welfare Principles for research, testing and teaching

ANZCCART promotes the [Three Rs Animal welfare principles]() for research, testing and teaching:

- 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 potential suffering and improving animal welfare.

ANZCCART (New Zealand)

[ANZCCART New Zealand's]() corporate mission is to promote:
- excellence in the care of animals supplied for or used in research, testing (within New Zealand), and teaching;
- responsible scientific use of animals;
- the Three Rs: Replacement, Reduction, and Refinement as they apply to the use of animals for scientific purposes;
- informed discussion and debate within the community regarding these matters;
- strategic partnerships to contribute to the education and training of scientists, students, and the broader community.