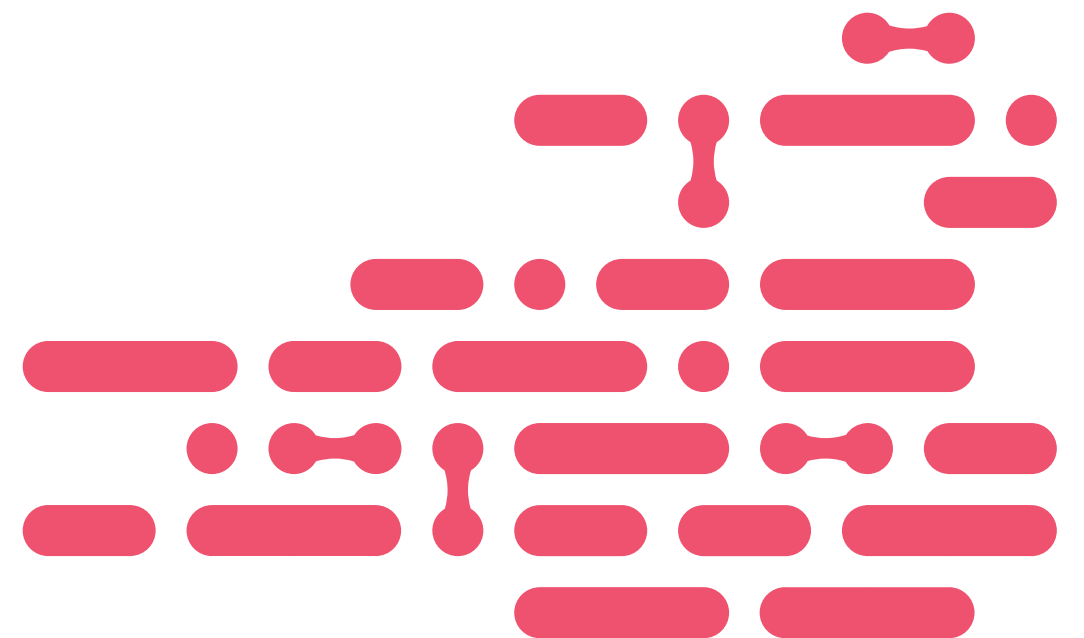# Swiss 3R Competence Centre
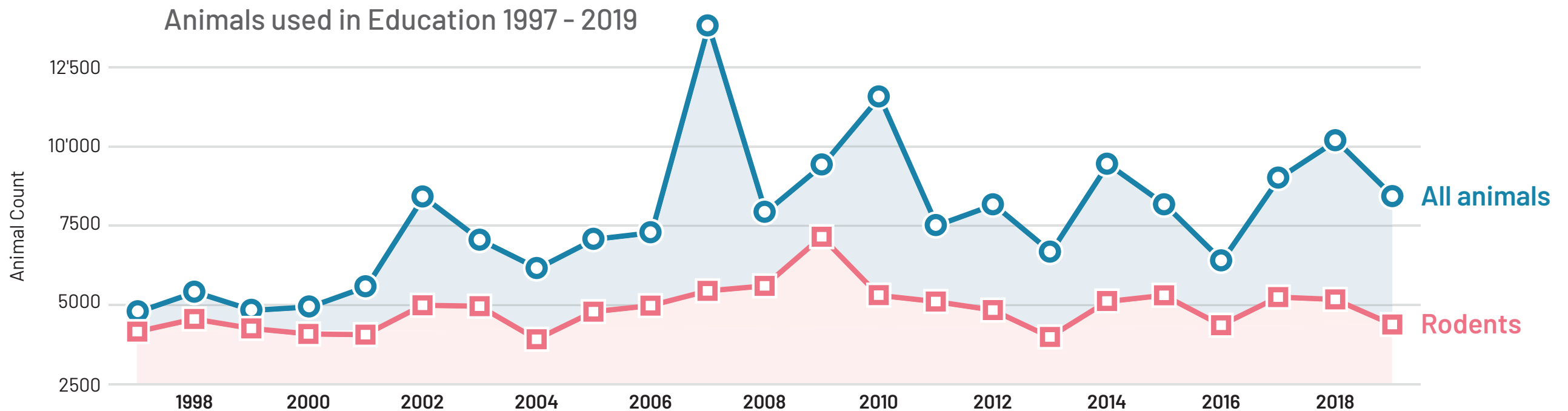
Animals in Education

A Perspective from Swiss HEIs in 2018

Scope and Background

Federal Food Safety and Veterinary Office (FSVO) Data

The number of animals used in education and training has been **generally increasing** in Switzerland (FSVO).


Animals used in Education 1997 – 2019

Because these statistics **lack resolution** in terms of the type of training for which the animals are used, the 3RCC conducted a survey to provide a better view on the statistics in the use of animals for education and training purposes.

Surveyed Institutions

In 2019, the 3RCC surveyed **eleven Swiss universities**, that are part of the 3RCC's executive board in order to better understand **why** and **how** they use animals for educational and training purposes.

- UniL
- EPFL
- ETH Zurich
- UniGe
- UniBas

- UniBE
- USI
- UZH
- FHNW
- ZHAW
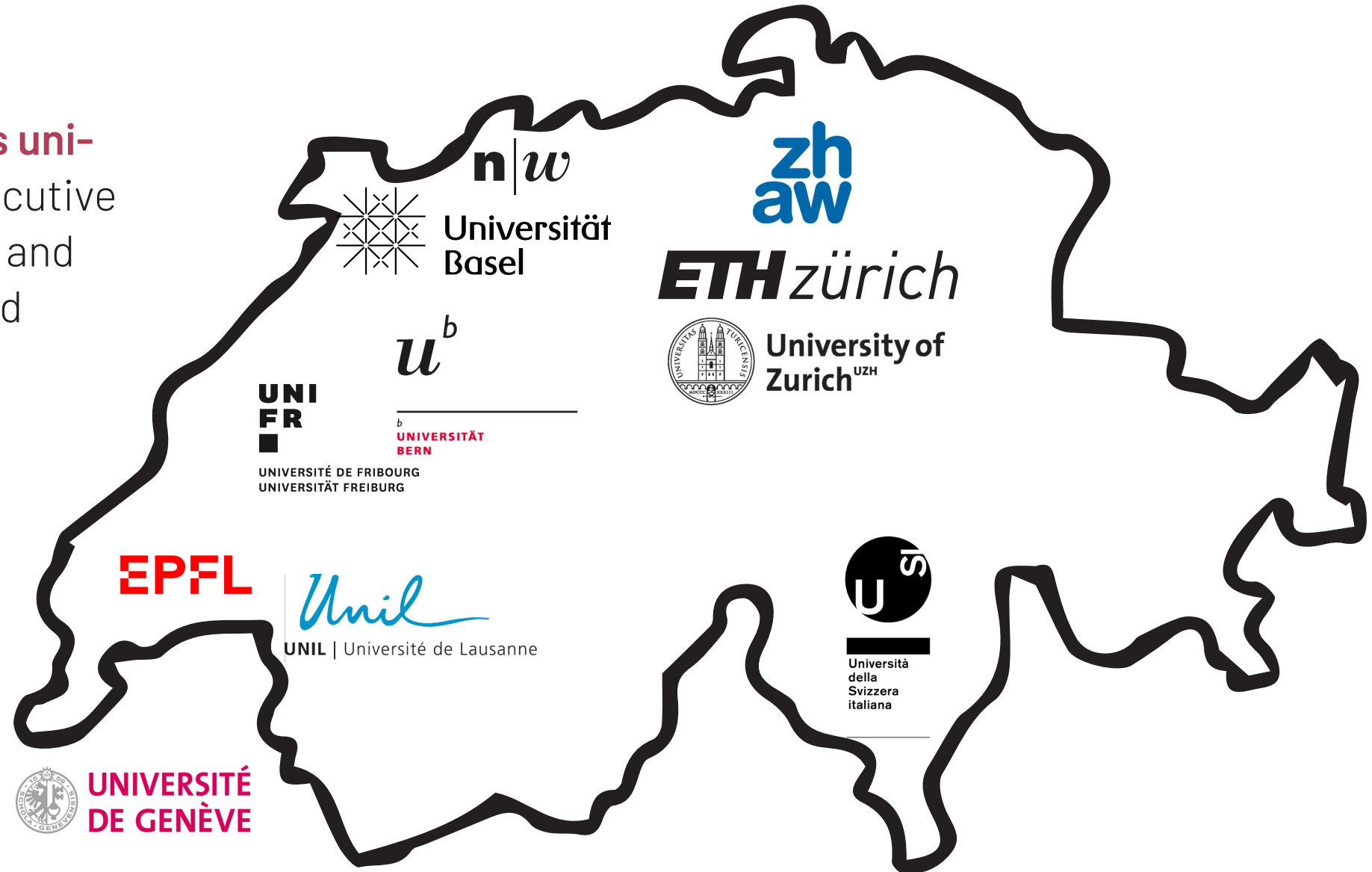
Results

Species

A total of **6,925** animals were used in 2018 in the surveyed HEIs.

2,857 mice were used, accounting for 41% of the total, while 1,133 (16%) were other rodents such as rats and guinea pigs.

For the training of veterinary students and agricultural professionals, 1,662 farm animals (e.g. including pigs, sheep, horses and poultry) were used (24%).

In the category of rabbits, cats, dogs and primates that was surveyed, it was found that only dogs were used (17 dogs).

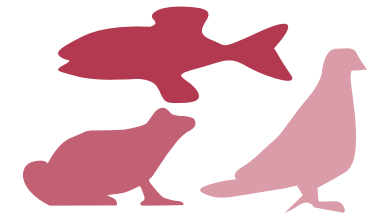The "other" category, which contains fish, reptiles, birds and amphibians, where 1,256 (18%) were used in training.
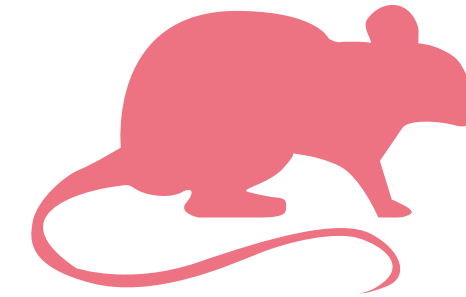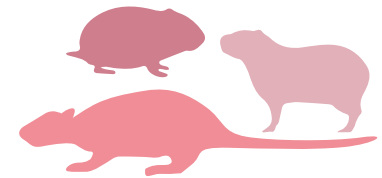
mice
2857

other
1256

rodents (excl. mice)
1133
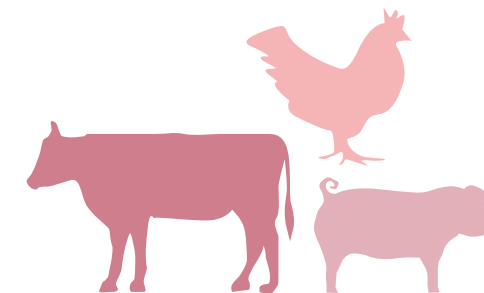
farm animals
1662
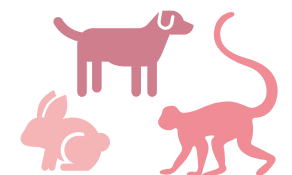
rabbits, cats, dogs, primates
17

3 R
C C

Education Categories

High-level courses (e.g. continuing education for those performing animal experimentation) represented more than half of the educational needs (n = 3,652; 53%), whereas basic education courses such as in veterinary medicine and general biology accounted for 24% (n = 1,695) and 16% (n = 1,076) of the distribution, respectively.

Of note, mice and other rodents were highly represented in the specific high-level courses (n = 3,252). Human medicine (n = 213; 3%) and other categories (n = 289; 4%) represented only a small proportion of all animals used.

No animals were used for Pharmacology or Toxicology training, which were also assessed in the survey.

High-Level Course

3652

Veterinary Medicine
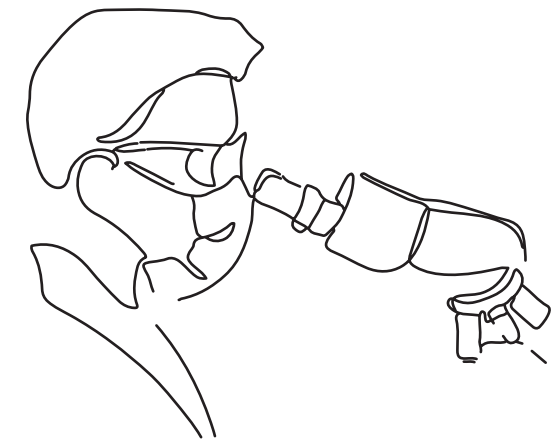
1695

General Biology

1076

Human Medicine

213

Other

289

Species and Course

High level courses, which include Laboratory Animal Science (LAS), that leads to a certificate and authorisation to handle and manipulate animals, were highly represented with mice (n = 2,193; 32%) and other rodents (n = 1,059; 15%) when compared to the total of animal used.

Veterinary medicine accounted for a large part in the use of farm animals (n = 1,632; 24%).

Classification of Species per Course Category

General Biology
1047

High-Level Courses
3652

Human Medicine
213

Veterinary Medicine
1695

Other
289

229
847

2193
1059
27
373

136
74
3

10
17
1632
36

289

Mice
2857

Rodents
1046

Rabbits, Dogs,
Cats, Primates
17

Farm Animals
1662

Other
1256
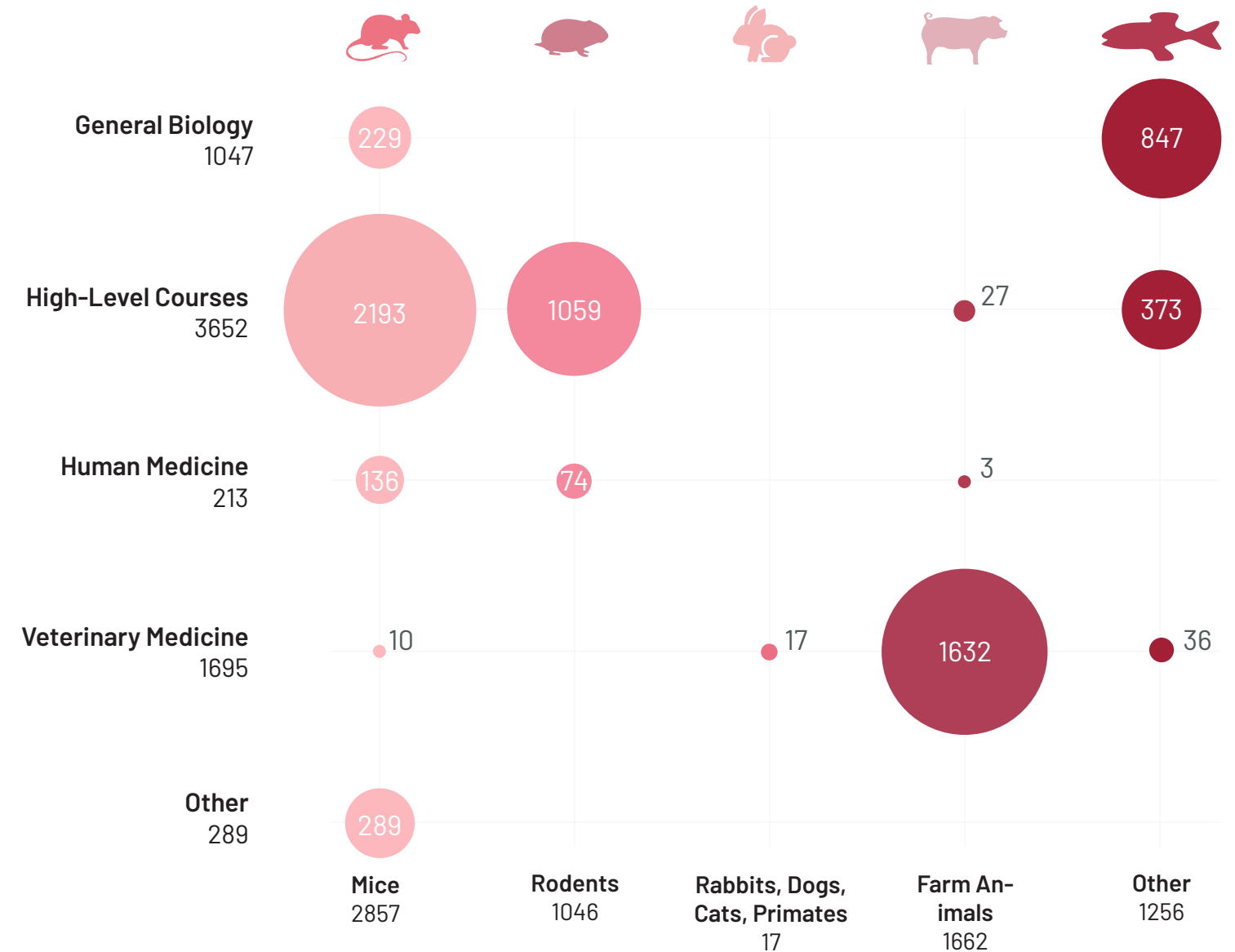
Species and Severity

About 6 % of the animals (n = 424) used experienced **no harm** (SD 0), while the remaining animals (n = 6,499) underwent procedures of **mild severity** (SD1).
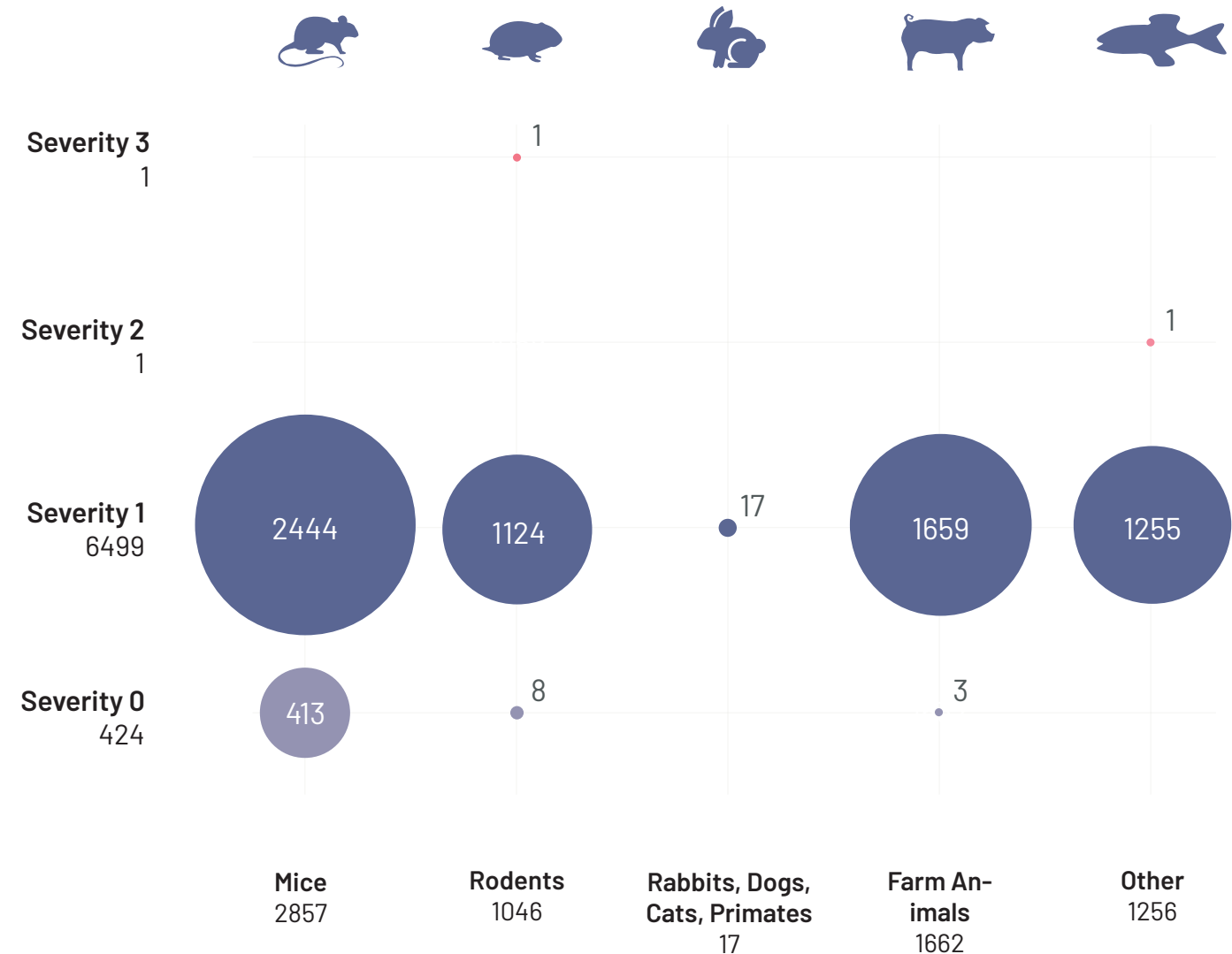
Mice account for **the largest share** of the animals used in SD1 procedures (n = 2,444; 37 %), followed by farm animals (n = 1,659; 26 %), other (n = 1,255; 20 %) and rats (n = 1,124; 17 %).

One fish was found classified in SD2 and one rat in SD3. **Retrospective analyses** revealed that these did not actively undergo any SD2/SD3 procedure, rather they were retrospectively labeled as SD2/3 due to unexpected events.

Classification of Species per Degree of Severity

see [https://www.blv.admin.ch/blv/de/home/tiere/tierversuche/schweregrad-gueterabwaegung.html] for detailed explanations of the severity degrees

3 R
C C

Fish in a tank

Classified in General Biology as SD1 in "Others" were **846 fish**, that were used in a course with a "catch and release" protocol.

While this may sound like a large number of animals, all fish from the same tank as those manipulated are considered to be exposed to a similar degree of severity and are thus reported, although even only one fish may have been handled. This is because a stressed fish may impact its congeners from the same tank.

The course is still taught but the license was not renewed and thus, fish are **no longer handled** in this course since 2018.

source: image adapted from Monash University Press Release image

Alternatives in Education

Refinement

HEIs reported that it is especially important i) to teach future professionals that will work with animals in the their biology and behavioural needs before getting in contact with animals and ii) to train them in the latest **refinement** methods.

Proper training with living animals is meant to enable students and professionals to handle animals with professional care. For instance, observing and interacting with the animals and their responses requires active thinking, which will **ultimately decrease** the stress of both the animals and their handlers.

In some courses, participants were trained to use different **non-aversive handling techniques** (e.g. tunnel handling or cup handling) that are less stressful than the traditional tail-handling method.
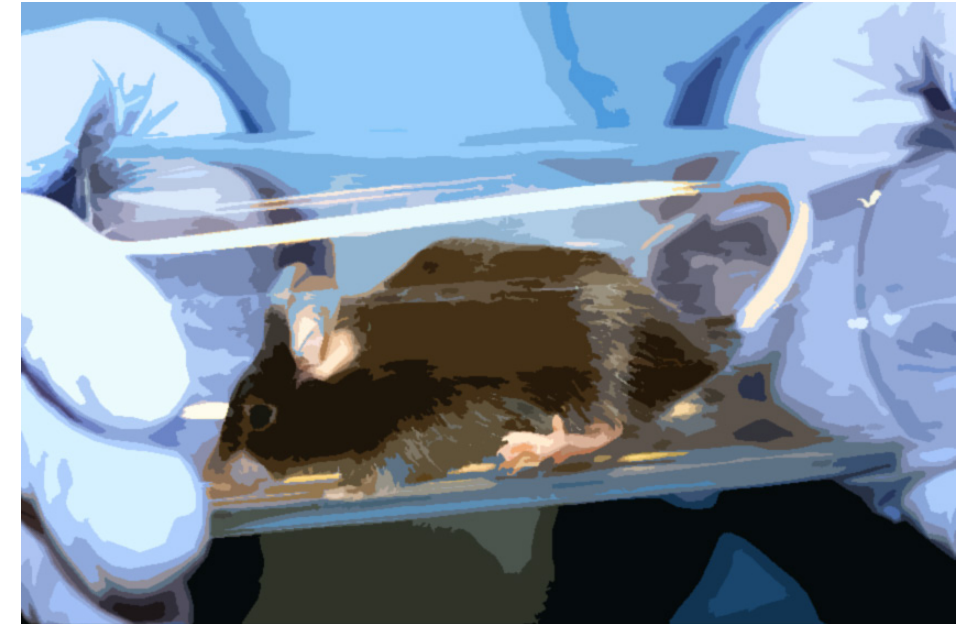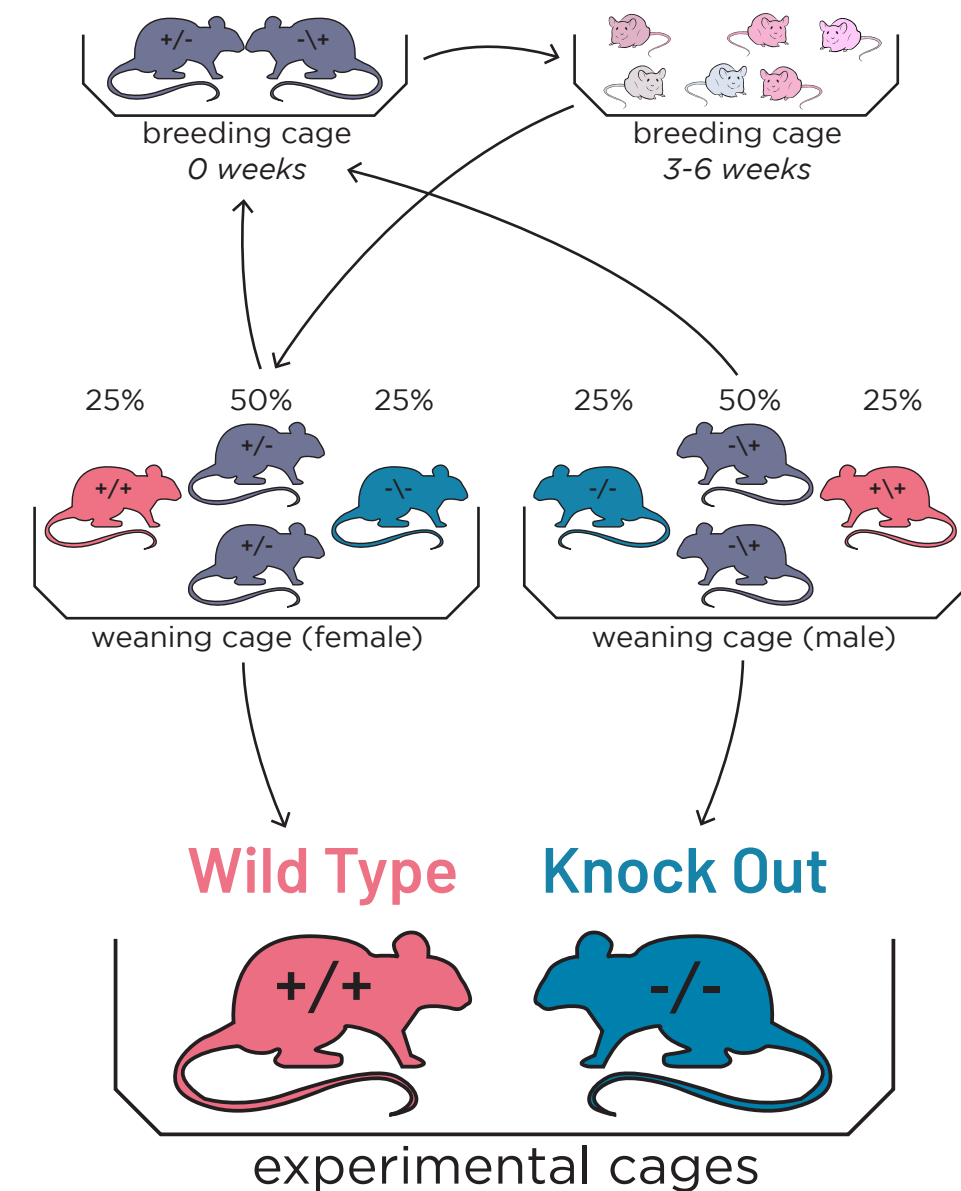

source:

Reduction

Surveys report the use of surplus animals derived from **breeding schemes** (such as genetically modified mice with non-interesting genotypes) or **old sentinels** (i.e. animals that are used to monitor the health and infection status in the animal facility) so that they do not have to breed or purchase animals **solely** for education purposes.

For instance, mice carrying **one mutant allele (+/−)** generated from genetic crosses are seldom used because researchers use animals carrying mutations on both alleles (**knock-out, −/−**), and those that carry none (**wild-type, +/+**).

+/− mice are bred together to generate pups that are weaned 3 to 6 weeks later. Males and females are separated and classified according to their alleles (**+/+**; **+/−**; **−/−**). **+/− mice** are either bred together again to generate another set of animals, or in the event there is no need for additional breedings, **these surplus animals are redirected to educational needs**. Only **+/+** and **−/−** animals are kept for experimental purposes.


breeding cage
0 weeks

breeding cage
3-6 weeks

25% 50% 25%   25% 50% 25%

+/+ +/− −/+   −/− −\+ +\+
+\−   −\+

weaning cage (female)   weaning cage (male)

Wild Type   **Knock Out**

+/+   −/−

experimental cages

3 R
C C

Replacement with Dummies

The survey also revealed that all universities use **replacement** methods such as audio-visual material, anatomical charts, 3D models or dummies, computational methods, simulations, atlases, and images to replace animals in education and training. For instance, veterinary students first use visual material and then practise with large animal **simulators**, artificial material such as silicon rabbit ears or artificial skin, and preserved cadaver materials. Small dummies are used in LAS courses.

For example, a new platform called PERCE (plateforme d'enseignement et recherche chirurgicale expérimentale) opened in 2018 to provide **virtual teaching and training** for big animal surgery at the CHUV and for the continuous training of surgeons as well as for students of the faculty of Biology and Medicine (and bioengineering students of EPFL).
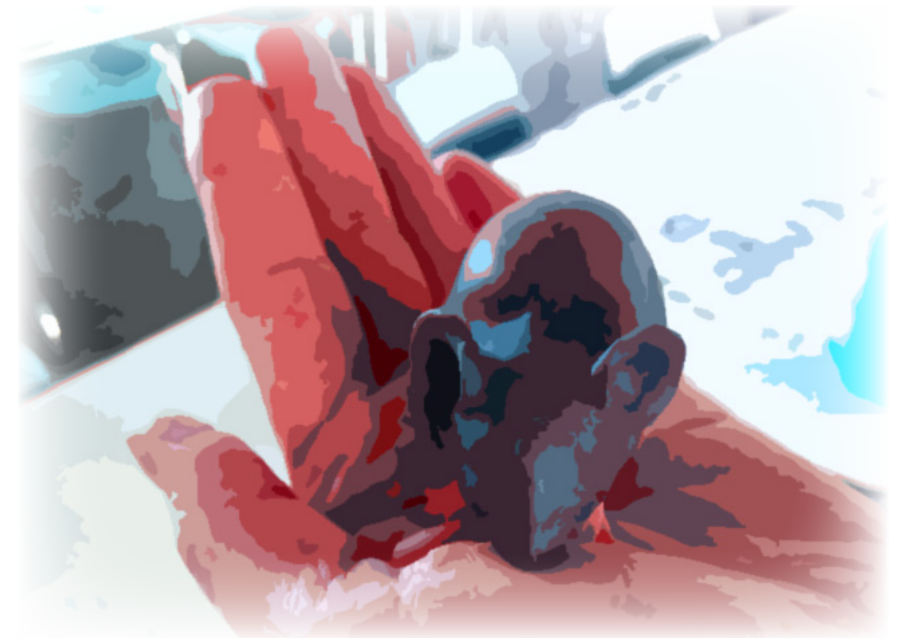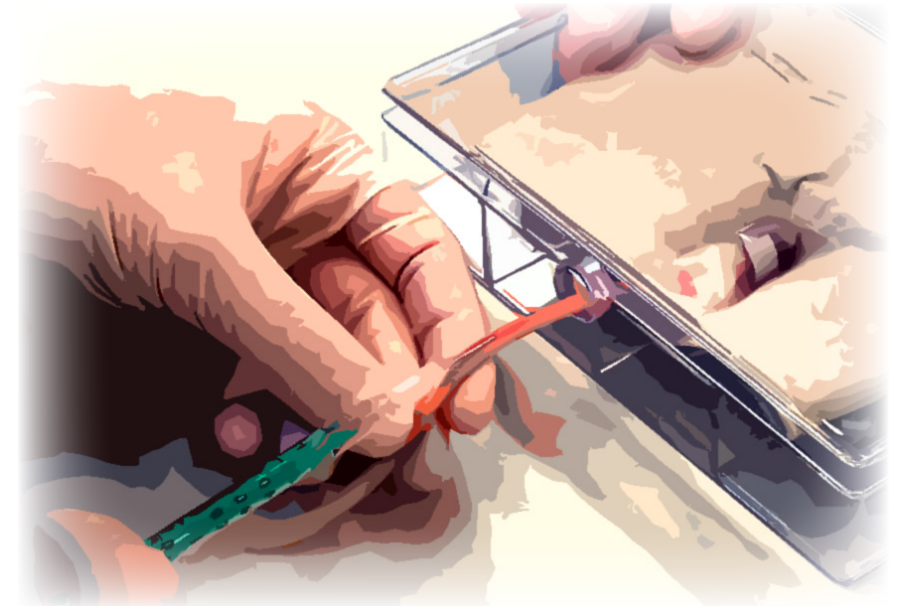
Examples of replacement strategies employed at Swiss HEIs. A mouse or simulator for practising standard procedures like tail vein blood collection (Mimikry Mouse Simulator). *Source: UZH.*

Replacement with Dummies

The Vetsuisse faculties in Bern and Zurich run a Skills Labs, where students practice their skills on horse models or haptic cows before working with live animals (**replacement**).

For microsurgery and tissue sampling exercises, students first practise on material from slaughterhouses or donated cadavers, but also euthanized animals derived from other experiments.

At some universities, in the early stages of training, courses use worms or human placental tissue for suturing practise.

Practising anaesthesia, placing a nasogastric tube in a horse or sutures are all trained on dummies. The advantage of such models is that incorrect manipulations do not harm anyone, pain is not inflicted, and it is safe to repeat until the desired level of expertise is reached.
Source: Vetsuisse NEWS Nr. 1, March 2015.

Summary

A total of **6,925 animals** were used in 2018 in HEIs. All animals were classified as SD0 or SD1 with the exception of two cases. Although we did not assess the trends in animal use accross several years, it appears as HEIs are **aware of the importance of 3Rs aspects** in education and training. Retrospective assessments show that a number of undergraduate courses are no longer active, or that the related ethical approval was not renewed. Reasons why other basic academic courses are still using animals **remains to be investigated** in greater details, since these students are not yet committed to a professional carreer with guaranteed handling of animals.

HEIs acknowledge that the main obstacles for the use of non-animal alternatives in education and training include a **lack of alternatives** (or knowledge of their existence), a **lack of teaching experience** with such alternatives, and **financial reasons** (dummies are extremely expensive).

Perspectives

Future studies should assess trends accross several years (e.g. from 2015 until now), and evaluate each single course in particular for basic academic courses. The number of animals used in each institution should consider the number of students attending such courses too.

Future surveys should also gain deeper insights into the origins of animals used for educational and training purposes. *Were these animals solely generated for this purpose, or were they intended for research and then redirected towards education and training?* How repeatedly have the individual animals been used for the same purpose is unknown. Animals repeatedly exposed to SD0 interventions within a short time may have been classified as SD1. Semi-structured interviews may help uncovering the gaps of the current survey and provide deeper insights into the use of animals in education and training.
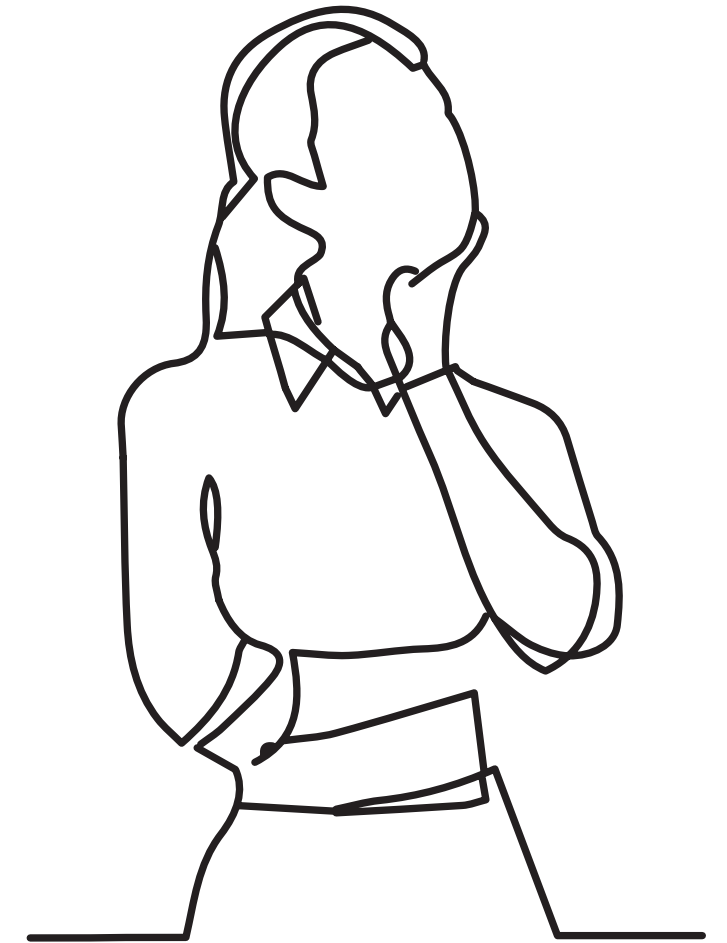
3RCC

Swiss 3R Competence Centre

3RCC Project Group: Christopher Cederroth, Philippe Bugnon, Paulin Jirkoff, Hanno Würbel

Graphs and Illustrations: Armand Mensen

Line drawings modified from free samples on dreamstime.com

Support from: 3RCC Executive Board and Directorate

Contact us
https://swiss3rcc.org
Phone +41 (0)31 631 5622
E-Mail secretariat@swiss3rcc.org

3RCC