Brazil Starts to Ban Animal Use in Higher Education: A Positive and Progressive Development

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Summary — The Brazilian government has published a resolution that bans animal use in some practical classes within undergraduate and high school technical education from April 2019. Resolution No. 38/2018, issued by the National Council for the Control of Animal Experimentation (CONCEA), bans the killing of animals for dissection purposes and animal experiments in practical classes that do not involve the acquisition of new skills. The initial call for the ban was by the Brazilian Network for Humane Education (RedEH), an independent body comprising Brazilian professors and international collaborators dedicated to the implementation of *replacement* alternatives in education. The call was supported by InterNICHE, and many professors and other international organisations. The Brazilian Council of Veterinary Medicine, which is responsible for regulating the veterinary profession in Brazil, also stated its support for humane education and for the ban. The call was the first formal request, and it eventually led to the first legal resolution for the replacement of animal use in education in Brazil. This represents an important historic landmark in the advancement of science education.

Key words: animal experiments, Brazil, CONCEA, dissection, education, law.

Animal Use in Education is Partially Banned in Brazil

Brazil has imposed a partial ban on animal use for educational purposes. From April 2019, the use of animals in many practical classes at undergraduate level and in high school technical education will be prohibited.

The National Council for the Control of Animal Experimentation (CONCEA), the Brazilian federal government's executive body that controls the use of animals for educational and scientific purposes, published the legislation (Resolution No. 38/2018) in the Federal Official Gazette of Brazil (1). This resolution (of 17 April 2018) "pro-vides for restrictions on the use of animals in education, in addition to the Brazilian Directive for the Care and Use of Animals in Teaching or Scientific Research Activities — DBCA". It states: "The use of animals in demonstrative and observational didactic activities that do not aim to develop psychomotor and other skills of the students involved is prohibited" (translation of original text by R. Bachinski and N. Jukes). 'Demonstrative activities' refer to the performance, by the student, of an animal experiment or other activity with animals in a practical class; 'observational activities' refer to the observation of the same activity, but performed as a demonstration by a professor or teaching assistant.

The ban refers to student practical classes for knowledge acquisition. The Brazilian Network for Humane Education (RedEH) and InterNICHE understand that it applies to practical classes within disciplines such as anatomy, pathology, physiology and pharmacology at undergraduate level and in high school technical education (in Brazil, high school [secondary] education is known as 'middle level'). The resolution, therefore, bans the killing of animals for anatomical dissection, and experiments involving the use of live animals or classical 'preparations' made from the tissue of freshly killed animals. The legislation affects a wide range of faculties, including medicine, veterinary medicine and biological sciences.

The reference to skills acquisition means that the ban does not cover practical classes for clinical skills acquisition and surgery training, nor any training in the conduct of laboratory animal experiments for research and testing purposes. It also explicitly excludes postgraduate studies and courses linked to farm animal health and welfare, i.e. the field of animal production. It is evident in the following passage from the resolution that it may also exclude other areas. However, these exclusions call for further clarification: "The prohibition established in the caput of this article is not applicable to didactic activities in postgraduate studies and those applied to biodiversity, ecology, zoology and conservation, production, animal health and inspection that give rise to diagnostic, therapeutic, prophylactic and zootechnical approaches, that aim for the reduction of health risks, physical harm or the improvement of the conditions of production, health or quality of life of the animals used" (translation of original text by R. Bachinski and N. Jukes).

The resolution requires the implementation of *replacement* alternatives by April 2019. It states that animal use "shall be fully replaced by videos, computer models, or other resources provided with sufficient content and quality to maintain or improve learning conditions" (translation of original text by R. Bachinski and N. Jukes).

The path toward this groundbreaking achievement in Brazil has been recognised by the Lush Prize on two occasions. In 2014, Róber Bachinski was awarded a Young Researcher Prize for his commitment to promoting the use of *replacement* alternatives in education. Then, in 2016, the 1R Institute received the Lush Lobbying Prize for its work on the preliminary steps toward securing the current ban on animal use.

Proposal Timeline

The ban successfully reflects some aspects of the proposals made to CONCEA by RedEH and InterNICHE, calling for a full ban on harmful animal use in education and training. In its policy, InterNICHE defines 'harm' and addresses in detail the use of animals and possible alternatives (2).

RedEH representatives formally submitted the proposal for a ban at the national symposium *Alternatives to Animal Use in Education*, which was organised by CONCEA and took place on 5–6 October 2016 (3, 4). This proposal outlined the pedagogical and ethical advantages of a ban on harmful animal use in education, and demanded the implementation of *replacement* alternatives. It detailed the range of alternative educational and training tools already developed and implemented in Brazil, as well as suggesting various resources that could be established to support a transition to humane education. The proposal was signed by academics and other professionals from across the country that together comprise the RedEH network.

Written support for the proposal from InterNICHE Co-ordinator Nick Jukes was formally read out at the CONCEA symposium. It described the range of alternative tools and approaches developed by academics and pioneering companies. In addition, it stressed that full replacement of harmful animal use is feasible and has already been achieved at a growing number of university departments, to the benefit of students, teachers and other professionals, as well as the animals. The symposium delegates agreed — with an overwhelming majority — on the feasibility of replacing harmful animal use in education, and they also agreed to the call for a ban. CONCEA was asked to help achieve this goal through the promotion of humane education across Brazil. Following the symposium, RedEH and InterNICHE also invited parties to submit written endorsements in support of the proposal. These came from interested professors, politicians, organisations and journals from across the world (3). These endorsements were collated and presented to CONCEA at a meeting held in November 2016.

The President of the Federal Council of Veterinary Medicine (CFMV), Dr Benedito Fortes de Arruda, wrote to CONCEA in April 2017, to convey the position of the CFMV concerning animal use in the veterinary field. The CFMV is a professional council that regulates the veterinary profession in Brazil, and advises on the education and training of future veterinarians. It supports a fully humane education, and calls for an end to harmful animal use at all educational levels, including higher education and high school technical education.

An article describing the progress of the lobbying campaign was published in *ATLA* (3), and given as an oral presentation by Nick Jukes on behalf of Róber Bachinski and RedEH at the 10th World Congress on Animal Use and Alternatives in the Life Sciences, held in Seattle, USA, in August 2017. This presentation was eight months prior to the publication of the resolution, in April 2018.

Definitions and Difficulties

The ambiguity inherent in the exclusions relating to farm animal health and welfare is a problem that may affect the impact of the ban in other fields, such as zoology and biodiversity. In Brazil, these disciplines are traditionally very conservative. It is hoped that the specific application of the ban will be clarified at forthcoming meetings between RedEH and CONCEA.

The exclusion from the ban of all animal use for skills acquisition is a disappointing barrier to progressive change. The combination of non-animal alternative tools with approaches that are ethically neutral or actively beneficial to individual animals, can provide opportunities for skills acquisition that are not only sufficient but are also often superior. Non-animal methods include training models and mannikins, advanced software and virtual reality. Recent developments in materials science and 3-D printing have produced synthetic tissue of exceptional quality (see for example [5]).

In relation to hands-on experience of animals and animal tissue — which is necessary for veterinary students and some zoologists, but not for medical students — it is important to think beyond conventional harmful animal use. There are two main humane approaches that involve animals. The first is the use of ethically sourced animal cadavers from body donation programmes at veterinary clinics. Such specimens can be used fresh or can be preserved and 'animated' through perfusion and pulsation for clinical skills and surgery practice (2). The second approach includes the wide range of clinical learning opportunities from real animal patients that can be provided by university-based animal hospitals. Individual animals and students both benefit from a real-life clinical environment, where practical skills can be gained in a context that is focused on healing rather than harming (6).

In his letter, the President of the CFMV also distinguished between harmful animal use and other non-harmful work with animals. He stated that hands-on experience of working with animals is indeed possible by using humane methods only, and illustrated the feasibility of employing clinical learning opportunities for the acquisition of technical skills.

Teaching Objectives and Conscientious Objection

Compared to harmful animal use, alternatives can better-meet standard teaching objectives in the fields of clinical skills and surgery for medical and veterinary medical training. This can be achieved by employing tools and approaches that may involve the use of cutting-edge technology, that demonstrate a considered assessment of the required competencies, and that can reflect a greater sensitivity to the learning process. Alternatives can also help to meet new objectives, such as learning new computer-based skills, recognising and developing care as a clinical skill, and participating in clinical work that has a positive social impact (7). Furthermore, the use of alternatives can obviate the negative lessons and processes in the 'hidden curriculum' of harmful animal use. These include unthinking conformity, resistance to innovation and change, the acceptance of instrumental animal use and harm, and the process of de-sensitisation, all of which can impact negatively on individuals and professionals as a whole.

In 2015, RedEH and its sister organisation, the 1R Institute, asked CONCEA and the Ministry of Science, Technology and Innovation (MCTI) to protect and support students who conscientiously object to animal experimentation, and to make participation in practical classes involving harmful animal use non-compulsory. In February 2016, CONCEA legislated that institutions that use animals have a legal responsibility to offer alternatives to conscientious objectors when evaluating student performance through tests, such as in the case of practical classes. In addition, it stipulated that institutions should have an institutional ombudsman for issues relating to animal use (8).

The new resolution (No. 38/2018) will provide additional security for students who wish to complete their studies without undertaking animal experimentation and other harmful practices, thereby making education freer of academic and psychological coercion, and making it more accessible and inclusive. It will also help to avoid the need for students to conscientiously object to practices that go against their deeply held moral or religious beliefs — or against the ethics of care and respect that is at the root of both human and veterinary medicine.

Other Laws and Norms

As a resolution, the ban has similar power to a law, but it derives from the executive body of the federal government. Historically, animal use in primary and most high school (secondary) education was banned by *Law 6.638 of 1979*, when Brazil began regulating animal experimentation. *Law 9.605 of 1998* (Environmental Crimes) established the act of "[performing] a painful or cruel experiment on a live animal, even for scientific or teaching purposes, […] when alternative resources are available" as a crime, with an increased penalty if the animal died. Neither *Law 6.638* nor *Law 9.605* has been effectively applied (9–14).

The passing of federal *Law 11.794 of 2008*, also known as Arouca's Law, was partly rooted in

efforts by researchers to continue animal experimentation in the face of growing opposition, by accepting a degree of regulation and stated conformity to the Three Rs. Arouca's Law established CONCEA and addressed the use of animals and alternatives primarily in research, but also to a limited degree in education. Arouca's Law effectively revoked *Law 6.638*, but kept the prohibition of animal use in schools. High school technical education was not covered by *Law 6.638*, but the 2019 CONCEA ban does include it. Municipal regulations that limited animal use in education and research in Rio de Janeiro and Florianópolis were negated by Arouca's Law (15).

The Brazilian Center for the Validation of Alternative Methods (BraCVAM) was first proposed in 2008 and established in 2014 (16, 17). It is based at the National Institute for Quality Control in Health, at the Oswaldo Cruz Foundation (INCQS/FIOCRUZ), which is part of the Ministry of Health. The National Network for Alternative Methods (RENAMA) was established in 2012 (18, 19) and as CONCEA is part of the (newly renamed) Ministry of Science, Technology, Innovation and Communications (MCTIC).

The evolution of CONCEA resolutions has demonstrated a commitment to scientific progress, including the support for the replacement of harmful animal use and the development of humane values and critical thinking (8, 20). As well as addressing conscientious objection, and now education more broadly, the new resolution has included a provision for banning animal testing for toxicity endpoints when internationally validated alternative methods exist (21, 22).

Two bills calling for a ban on harmful animal use in higher education are currently being addressed at federal and state legislative levels in Brazil. The first is bill *PL 1798/2015* in the Brazilian parliament, with Representative Ricardo Izar as the author; the second is for the state of São Paulo alone.

Impact and Future Development

Resolution *No. 38/2018* comprises the first legal regulation in Latin America that addresses the replacement of animal use at undergraduate level and in high school technical education. Despite its shortcomings, its implicit acknowledgement of the feasibility of *replacement* is important. Brazil is the most populous country in Latin America and the fifth most populous globally, so the changes are very significant in terms of the breadth of nation application and the potential influence on other countries.

Most national laws do not yet call for best practice nor reflect the reality of positive change already achieved within many university departments. But, for many academics, the use of 'alternatives' in education is now standard. RedEH and InterNICHE consider the exclusion of skills acquisition from the ban to be unnecessary. It is hoped that this exclusion can be remedied in a future resolution or law, and that alternatives can be recognised not only for their potential to enhance knowledge acquisition, but also for their role in optimising skills acquisition. In this way, full *replacement* rather than partial *replacement* can be achieved.

The impact of a growing familiarity with *replacement* alternatives at student level also supports the implementation of such alternatives in the fields of research and testing. Humane education is a prerequisite for an effective and humane science.

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