Teaching strategies, practices and activities for effective education in animal welfare

Editoras: Victoria Pereira Bengoa | Rosângela Ribeiro Gebara | Melania Gamboa
Teaching strategies, practices and activities for effective education in animal welfare

Editoras: Victoria Pereira Bengoa | Rosângela Ribeiro Gebara | Melania Gamboa

4,074 Kb; PDF

Access: World Wide Web

ISBN: 978-8563814050


CDU 614.9

Ficha Catalográfica elaborada por Renata Gonçalves - CRB – 8 n° 8248
Strategies and teaching practices oriented to animal welfare education in large animals

Animal welfare in pre-slaughter: meaningful learning
Marlyn Hellen Romero Córdoba

Interactive strategy for the development and validation of scientific protocols to evaluate animal welfare
Adroaldo José Zanella

Field assessment of the welfare of production animals
Sergio Alberto Parra

Identification of behavioral problems in horses that pull carts in Bogotá, Colombia, as an indicator of animal welfare, and organization of a Health Brigade for horses
Juan David Córdoba Parra

Teaching animal welfare in animal science
Priscila Cotta Palhares

Strategies and teaching practices oriented to the teaching of animal welfare in small animals and responsible pet ownership

Workshop for environmental enrichment for animals in shelters
Carmen Luz Barrios Gómez

Applying animal welfare to the medical care of small animals
Ángela Olavarría Cortés

Lectures on Responsible Pet Ownership
Graciela Estrada Dávila
Strategies and teaching practices promoting humanitarian use of animals in education and research

Development of models to simulate collection of blood samples and administration of intravenous drugs as humanitarian alternatives in the teaching of veterinary medicine

Edison Alberto Cardona Zuluaga y Sergio Alejandro Salas Suárez

Use of simulation models in the teaching-learning of clinical skills for small animals

Cintya Boroni González and Alberto Goldsack Merino

Conservation of Anatomical Specimens and the Creation of an Embryological Collection

Daniel Fernando González Mendoza

Quality, validity, reproducibility, respect and recognition: an integrated transnational model for learning in animal research ethics

Carmen Alicia Cardozo de Martínez

Ethics in the Use of Animals and Animal Welfare

Marta Luciane Fischer

Strategies and teaching practices with community outreach for effective teaching of animal welfare

Everyone in support of the welfare of domesticated animals

Sandra Adelly Alves Rocha

Learning about Animal Welfare outside the classroom

Rosemary Bastos

Welfare of animals participating in educational psychology and environmental education projects in public schools in the city of Ponta Grossa

Erika Zanoni

Humanitarian Education in Animal Welfare

Marcia Marinho
Strategies and teaching practices transverse and / or trans-disciplinary to effective teaching animal welfare

Building a concept of animal welfare at UFFS (Realeza Campus) using a problem-solving methodology: teaching challenges
Denise Maria Sousa De Mello

Understanding the behavior of animals in natural environments to promote minimum levels of welfare
Adriano Braga Brasileiro de Alvarenga

PIBAS - Sustainable Integrated Animal Welfare Program. “Ignacio Agramonte” University. Camagüey, Cuba
Elena de Varona Rodríguez
Alves Rocha, Sandra Adelly
Instituto Federal Goiano - Câmpus Ceres
Brasil
sandrarochabiologa@gmail.com

Barrios Gómez, Carmen Luz
Escuela de Medicina Veterinaria
Universidad Mayor
Chile
calu.etologa@gmail.com

Bastos, Rosemary
Centro de Ciências e Tecnologias Agropecuárias
LRMGA/ Setor de Comportamento e bem-estar animal
Universidade Estadual do Norte Fluminense Darcy Ribeiro
Brasil
rosebast@gmail.com

Brasileiro de Alvarenga, Adriano Braga
Faculdade de Medicina Veterinária, Campus de Castanha/ Licenciatura em Ciências Biológicas do Campus de Soure [Ilha do Marajó]
Universidade Federal do Pará
Brasil
aabrasileiro@ufpa.br

Boroni González, Cintya
Universidad Andres Bello
Chile
cintya.borrni@unab.cl

Cardona Zuluaga, Edison Alberto
Facultad de Medicina Veterinaria y Zootecnia
Universidad CES
Colombia
ecardonaz@ces.edu.co

Cardozo de Martínez, Carmen Alicia
Instituto de Biotecnologia
Universidad Nacional de Colombia
Colombia/Chile
carmen_aliciademartinez@yahoo.co.uk

Córdoba Parra, Juan David
Facultad de Ciencias Pecuarias
Universidad de Ciencias Aplicadas y Ambientales
Colombia
jucordoba@udca.edu.co

Cotta Palhares, Priscila
Instituto Federal de Educação, Ciência e Tecnologia
Sudeste de Minas Gerais
Campus Rio Pomba
Brasil
priscila.palhares@ifsudestemg.edu.br

De Varona Rodríguez, Elena
Facultad de Ciencias Agropecuarias
Universidad de Camagüey - “Ignacio Agramonte”
Cuba
elenadevarona@reduc.edu.cu

Estrada Dávila, Graciela
Carrera de Medicina Veterinaria y Zootecnia
Universidad de Las Américas
Ecuador
tenenciaresponsable@udla.edu.ec
Fischer, Marta Luciane  
Programa de Mestrado em Bioética - PUCPR  
Coordenadora do CEUA-PUCPR  
Editora Chefe Estudos de Biologia: Ambiente e Diversidade  
Laboratório NEC-PUCPR - ESB-PUCPR  
Pontificia Universidade Catolica de Paraná  
Brasil  
fischer.mrt@gmail.com

Goldsack Merino, Alberto  
Universidad Andrés Bello  
Chile  
cintya.borroni@unab.cl

González Mendoza, Daniel Fernando  
Facultad Ciencias Agrarias  
Centro de Investigaciones en Pequeños Rumiantes CIPER-JDC  
Grupo Investigación INPANTA - línea de investigación en Producción de Rumiantes.  
Fundación Universitaria Juan De Castellanos  
Colombia  
dgonzalez@jdc.edu.co

Marinho, Márcia  
Faculdade de Medicina Veterinária e Zootecnia  
Universidade Estadual de São Paulo  
Brasil  
mmarinho@fmva.unesp.br

Olavarria Cortés, Angela  
Hospital Clínico Veterinario  
Universidad Católica de Temuco  
Chile  
aolavarria@uct.cl

Parra, Sergio Alberto  
Facultad de Ciencias Veterinarias  
Universidad Nacional del Litoral  
Argentina  
sparra@fcv.unl.edu.ar

Romero Córdoba, Marlyn Hellen  
Facultad de Medicina Veterinaria y Zootecnia  
Universidad de Caldas  
Colombia  
marlyn.romero@ucaldas.edu.co

Salas Suárez, Sergio Alejandro  
Facultad de Medicina Veterinaria y Zootecnia  
Universidad CES  
Colombia  
ecardonaz@ces.edu.co

Sousa De Mello, Denise Maria  
Universidade Federal da Fronteira Sul  
Campus Realeza  
Brasil  
denise.mello@ufts.edu.br

Zanella, Adroaldo José  
Departamento de Medicina Veterinaria Preventiva e Saúde Animal / Faculdade de Medicina Veterinária e Zootecnia / Universidade de São Paulo - Campus Pirassununga  
Brasil  
adroaldo.zanella@usp.br

Zanoni, Erika  
Hospital Veterinario do Centro de Ensino dos Campos Gerais (CESCAGE) / Associação Pontagrossense de Portadores de deformidades faciais (APPDF)  
Brasil  
erika.zanoni@yahoo.com.br
In recent years, animal welfare has had a strong development worldwide; society, academics, and researchers have been widely interested in the subject. However, this is not a new topic. It is, indeed, very current. For the academic and educational sector, it is very important not only to analyze various aspects of the production and use of animals, but to also disseminate to society the respect and ethics activities related to them. The World Animal Protection has developed many activities in different countries for the protection, care and welfare of animals, such as theses books, which seeks to spread not only activities and practices developed in the education sector, but strategies on how to achieve them. Undoubtedly, the best way to achieve an ethical aim and respect for animals is through educating society and all those who have close contact with animals, as in the case of students of Veterinary Medicine. That is why the studies that were selected to appear in this document were mainly related to the teaching practices and educational alternatives. Nevertheless, strategies and practices for teaching animal welfare also reach aspects of animal production and health. The Pan American Federation of Colleges of Veterinary Science welcomes the initiative of the World Animal Protection in drafting this document.

Dr. Juan de Jesus Taylor Preciado
President
Pan American Federation of Colleges of Veterinary Science
Throughout history, human development has required the intervention of man on nature and the environment that surrounds him.

For many centuries, humans evolved and moved from individual to primitive social forms and then proceeded to building family and society.

Man has shared food sources, water, air, plants, minerals and scenery with the other members of the zoological scale., However, given that Homo sapiens is the “king of creation”, he has arranged for exclusive use of such property in a chaotic and selfish way, leading the planet to such critical crossroads that which it is becoming a hostile environment for life.

In this evolutionary spiral, we have reached our days with great and wonderful scientific and technical progress, but with a common house that is falling apart. Therefore, it is important that we take this phenomenon seriously and undertake, with much more strength and determination, each in their area of study, job or position, the task of contributing to slow down deterioration and, at the same time, apply corrective measures to reverse some of what has been lost.

Part of this work is seen in the programs developed by WAP. This is both an extraordinary idea and action plan that fills us with hope, because protecting animals and fighting for their welfare directly benefits humans.

We, veterinarians, support and applaud the work of WAP in editing of this book that will serve as another piece of information contributing to humanity - a species in need of guidance and some good news.

Thanks to all our friends at World Animal Protection

Dr. Franklin Clavel L.
PANVET President
Introduction

The World Animal Protection is a global nonprofit organization, based in London, working for over 50 years for the protection and welfare of animals. With 14 offices worldwide, its programs are developed in more than 50 countries on four main fronts: production animals, animals in disaster situations, animals in communities, and wildlife. The World Animal Protection is currently the only international NGO dedicated to the welfare of animals that holds a consultative status with the UN, in collaboration with the OIE and representation within the European institutions.

In 2014, the World Animal Protection Educational Program, with support from the Pan American Council on Education in Veterinary Science (COPEVET), the Pan American Association of Veterinary Sciences (PANVET), and the Pan American Federation of Colleges of Veterinary Science, launched the contest “Practices and Strategies for Effective Teaching of Animal Welfare in Latin America” aimed at teachers and professors of the Faculty of Animal Science (Veterinary Medicine, Zootechnics, etc.) in order to identify the best and more innovative teaching and learning strategies for Animal Welfare in our region.

This initiative came to be from the need to meet the educational reality to teach a necessary science, but that is still little known and widespread in some parts of our continent to make this valuable information available to all professors and educators, encouraging them to replicate them and to improve their ways of teaching animal welfare.

This book presents 20 strategies selected by a board of professionals from Argentina, Brazil, Chile, Colombia, Cuba, and Ecuador and focuses on studies about teaching animal welfare of large animals, small animals, teaching practices that foster the humanitarian use of animals in education and research, educational outreach to the community, and some cross-training of the professional training or transdisciplinary process.

We especially want to thank Dr. Carmen Gallo and Dr. Beatriz Zapata, from Chile; Dr. Stella Huertas, from Uruguay; Dr. Nestor Calderon, from Colombia; Dr. Maximino Mendez and Dr. Apollo Carrasco, from Mexico; Dr. Jorge Quiroz, from Costa Rica; and Dr. Carla Molento, Dr. Iran Olivera, and Dr. Denise Leme, from Brazil, who participated as judges for the selection of the strategies presented in this book.

We hope the amazing projects developed by professors and portrayed in this book can inspire many other professors, always keeping in mind that it is possible to change and improve the teaching of animal welfare - a science that is very important and relevant to the training of current Veterinary Science.
Chapter 1

Strategies and teaching practices oriented to animal welfare education in large animals
Animal welfare in pre-slaughter: meaningful learning

Marlyn Hellen Romero Córdoba
Colombia

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used:
Public Health

Introduction, context and justification for the teaching strategy, practice or activity
Pre-slaughter (the period that covers shipping from the farm to slaughter) is a stressful experience for the animals that generates economic losses related to viscera, weight loss, mortality, changes in meat quality, etc. Likewise, this stage negatively impacts the welfare of the animal as the animals are submitted to cruel practices, prolonged fasting and environmental challenges that generate physical and psychological stress. In recent decades, researchers have made progress in the study of animal welfare by developing important assessment indicators, which have been poorly implemented by industry due, in part, to a lack of awareness and training of human resources.

A challenge faced by university faculty is how to present course content and practices, and transform them into meaningful learning for students through the use of teaching resources and methodological strategies. One of the strategies to obtain significant results in the teaching of animal welfare is the methodology learning by doing, which leads students to relate newly acquired knowledge to previous concepts, day-to-day situations and their own experience in real situations. Associating research and teaching activities provides an excellent opportunity for learning because it prompts the questioning of concepts that form the basis of traditional practices of pre-slaughter handling, explains why changes should be introduced and shows the implications for the animal and the meat.

---

1 This was the winning strategy of the competition “Teaching strategies, practices and activities for effective education in animal welfare,” organized by World Animal Protection with support from PANET, COPEVET and the Federation of Colleges of Veterinary Medicine and Animal Science.
industry, based on scientific concepts that support further changes, enabling users to understand and accept this new vision. In the context of meaningful learning, the teacher must have the background and the ability to convey meaningful knowledge to students.

This work presents the use of the strategy learning by doing in the teaching of animal welfare in pre-slaughter as a means to build meaningful knowledge, by associating research with classwork, teamwork and the resolution of industry problems.

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

The skills needed to achieve meaningful learning in animal welfare require the learning of a conceptual framework that enables the students to understand the impact of pre-slaughter handling on physiological stress, and, in turn, the impact on costs, health and production. Activities should be provided that awaken students' interest in animal welfare research activities, to allow them to experience new situations based on a need (solution of a real problem), which prompts them to employ previous acquired knowledge to generate new learning. Finally, this enhances their ability to pass on the knowledge that they have acquired, and improves their verbal and writing skills.

Next, skills are presented that are then developed through the methodology learning by doing, by describing the supporting components or elements:

- Integrate knowledge of basic sciences, physiological and behavioral responses to stress and effect on meat quality.
- Work with and evaluate animal welfare indicators, evaluate and select assessment techniques; determine the impact of pre-slaughter handling on meat quality.
- Perform diagnoses on the level of animal welfare in production systems; administer and manage handling processes in accordance with animal welfare practices.
- Master the scientific terminology and concepts of statistical analysis; identify and analyze animal welfare problems; develop alternatives for handling in commercial conditions; formulate, manage, assess and adjust animal welfare projects.
- Participate in research groups on animal welfare in pre-slaughter. Participate in discussions and analysis of animal welfare problems; discuss measures for improvement in groups; express ideas and defend positions. Formulate, implement and assess animal welfare research projects.
- Deal with personal, social, production, corporate and business processes according to the requirements and resources of the region.
- Express in writing and orally the application of the animal welfare indicators used, the results obtained and opportunities for improvement. Convey this to the group in an appropriate manner and to an assembly; participate in the training of employees at slaughterhouses.

Methodology

The teaching strategy learning by doing was used in public health courses as part of programs in: Veterinary Medicine and Animal Science and Masters in Veterinary Sciences, connecting research projects, graduate students and the Animal Welfare Research Group.

- Definition and construction of conceptual framework. Since most undergraduate students know little about the process of slaughtering cattle and pigs, reading was assigned in advance, visits made to a meatpacking plant and classes given on the basic concepts of the process, with the aim of providing context for the new content and previously acquired knowledge. The teacher identified the concepts and proposals most relevant to animal welfare during the pre-slaughter phase using the results from preparatory research. Multimedia files and a primer were created. These presentations were prepared in PowerPoint with digital photographs, short videos and bibliographical information on situations that enabled the evaluation of animal welfare through physiological, pathological, physical and behavioral indicators. This information was gathered from farms and meatpacking plants. The students discussed each one of the aspects of animal welfare during the pre-slaughter.
- Validation of knowledge through experience. The students, motivated by animal welfare, joined the research group, where the methodology learning to learn was fostered by forming subgroups that studied pre-slaughter and evaluation indicators, with graduate students receiving guidance in bimonthly work meetings. Two lines of research were developed and the undergraduate and graduate students carried out the projects. Group meetings were held to evaluate the processes and strengthen the training of the students in the activities that require support.
• Training of the employees at the plants. In the meatpacking plants evaluated, the employees received general training in animal welfare, handling of the animals based on behavioral principles and on the weaknesses detected in different studies, specifically, handling after arrival and humanitarian slaughter criteria.

• Dissemination of the results of the research. The students submitted their work to national and international scientific events and wrote articles that were published in indexed journals.

An evaluation was carried out to determine the ability of the students to define basic concepts of animal welfare in their own words, the attitude of the students while carrying out their research, what they learned from the normal procedures for animal welfare indicators, their ability to convey information when training employees at meatpacking plants and their capacity for analysis during the work in groups.

Animal welfare content addressed in the teaching strategy, practice or activity

The themes selected are important to ensure a cognitive structure for meaningful learning on animal welfare during pre-slaughter, according to recommendations made by researchers, the OIE, STEPS program by the WSPA and from the experience of the group.


• Cattle and pig ethology. Basic concepts of each species. Sensory characteristics (sight, smell, hearing and communication). Behavioral indicators to evaluate animal welfare, stress and flight behaviors. Principles of animal handling: flight zone, point of balance.

• Overview of pre-slaughter handling. Animal welfare legislation in Colombia: farms, shipping, rest at plant, slaughter (numbing and bleeding). OIE recommendations. Health requirements, legal requirements, current state of pre-slaughter in Brazil and the world. Characteristics of the facilities at the farm, for shipping and at the meatpacking plant.

• Overview of shipping. Pre-shipping handling at the farm, shipping conditions, truck characteristics, animal densities and risk factors that affect animal welfare.

• Handling at meatpacking plant. Facilities, unloading, rest conditions at the plant, handling during transfer, health requirements for cattle and pigs.

• Overview of slaughter (numbing and bloodletting). Principles of desensitization of cattle and pigs. Approved stunning systems, necessary equipment, advantages and disadvantages of each method. Monitoring of the effectiveness of desensitization, characteristics of appropriate bloodletting, humanitarian and ritual slaughter.

• Animal welfare indicators for pre-slaughter. Concept of stress and types of evaluation, concepts and factors that affect the quality of meat (PSE and DFD meat), evaluation of pH, color, ability to retain water and tenderness. Physiological, behavioral, pathological indicators (lameness, nasal and vaginal secretion, body condition, mortality, presence of prostrate pigs, etc.), monitoring and evaluation of contusions in accordance with protocols approved in the country, economic losses during pre-slaughter.

Teaching results obtained

The teaching results listed show the capacity that these students developed to assimilate and relate the new information to previously acquired knowledge and reorganize the information that they learned and to apply it to research on a specific animal welfare problem. The main results achieved were:

• Strengthening of collaborative work and the capacity to take on responsibility. The students were able to build knowledge collectively through discussions and debates, developing research projects and evaluating indicators based on evidence. This process favored the validation of the concepts, as is done in academic communities, fulfilling the proposal of learning by doing research. Each student was responsible for his work in the collaborative project and in the process of formulating, planning, applying and disseminating results.

• Fostering of a unique learning environment based on the study of real problems in industry. The learning by doing methodology enables students to walk in the shoes of the researcher in a hands-on approach, studying problems that will benefit not only their experience, but also acquiring tools to understand the reach and complexity of the research process. The students obtained greater awareness about the importance of animal welfare during pre-slaughter, the indicators available for use in meat chains and the ability to de-
Teaching strategies, practices and activities for effective education in animal welfare

Develop strategies to resolve problems. Training in decision-making based on ethical aspects of humanitarian slaughter and the opportunity to participate in training programs for the employees of the meatpacking plants enabled the students to strengthen their work with producers and their ability to become specialists in animal welfare for industry and academia.

- Coordination of undergraduate and graduate projects. The collaborative work of the undergraduate and graduate students favored an assimilation of knowledge and multidisciplinary reasoning. The coordination between the academic concepts and research, the collaborative work and follow-up by people with different pieces of knowledge allows the role of the teacher and the student to be more flexible and effective. For the university, the use of resources was much more efficient and the impact of the research conducted was greater.

- Development of oral and written skills by students. From participating in the project and disseminating the research, the students learned communication techniques, how to perform data analysis, search for scientific information, use programs and conduct exploratory research, etc. The project also stimulated their capacity for leadership, initiative, teamwork and individual work.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

- Scientific and technological impacts: A baseline for pre-slaughter handling of pigs and cattle in Colombia was established. The students produced five research proposals on animal welfare. At the WSPA competition on animal welfare (2008 and 2009), these proposals came in second and third place, respectively. At the Encuentro de Investigadores en Ciencias Pecuarias (ENICIP) 2011, they came in first place as the best graduate work and two theses were recognized.

- Strengthening of Colombian scientific community. The line of research in public health and animal welfare was consolidated. It provides support for the doctoral program in agrarian sciences, masters in veterinary sciences and the MVZ program at the University of Caldas. In this process, one doctoral student, three masters students, two young researchers and undergraduate students, with six theses, were trained, and an animal welfare research group made up of twenty students was formed.

- Social/public appropriation of knowledge. Publication of fifteen scientific articles on animal welfare in pre-slaughter in national and international journals, creation of a primer and fifteen papers were submitted to scientific events.

- Impacts on the improvement in animal welfare in the pre-slaughter of pigs and cattle. The training of the employees at the meatpacking plants focused on the importance of appropriate handling of the animals, avoiding the use of abusive practices, and the implications of animal welfare on the productivity of the company. Improvements were introduced in the slaughter process, consisting of adjustments to the desensitization boxes, elimination of the use of electric prods and introduction of indicators to evaluate the efficiency of stunning. The faculty member was invited by university research groups to strengthen the study of pre-slaughter in export plants, by the Colombian Federation of Livestock Farmers to train quality control and production managers of the plants that supply to ASOCARNICAS and ASOFRIGORIFICOS, in an effort by the meat sector to strengthen animal welfare. The Colombian Association of Pig Farmers (ASOPORCICUTORES), through a cooperation agreement in force, will evaluate jointly with the research group the animal welfare conditions during the shipping of pigs in Columbia, with an eye to providing recommendations to the sector. The acceptance of professionals educated in the group, who work with and implement animal welfare practices on farms, in shipping and in the plants, is gratifying.

Conclusions/ observations/ recommendations

Education in animal welfare during pre-slaughter as a meaningful learning experience was a good starting point to develop educational techniques that enable students to understand what they are learning, based on scientific evidence. The use of the teaching strategy learning by doing, associating research with teaching activities in undergraduate and graduate programs, created optimal conditions for learning, fostering collective work, an interdisciplinary approach and promoted the study of real world problems. In this process, the students strengthened skills in analysis, problem solving, critical thinking and cognition, by participating in decision-making and in building meaningful knowledge.
The formation of human capital in specific areas of animal welfare and dissemination of scientific articles and works in academic events on the results obtained in the applied research enabled identification of the main problems that the Colombian meat industry must face when new health legislation comes into force, which includes animal health requirements in the pre-slaughter of cattle and pigs. These developments have increased interest in the theme on a national level, and placed up-to-date information and trained professional at the disposal of the academic community and industry.

Records and evidence of use of teaching strategy, practice or activity

Educational material – presentations in PPT

---

**TALLER EVALUACIÓN DEL PRESACRIFICIO BOVINO**

**CONDUCCIÓN Y CARGUE**

- Conducción de forma calmada y sin prisas.
- No usar elementos contundentes como palos o varillas para conducir los animales al embarcadero y al camión.
- No colocar lámpara eléctrica en áreas sensibles como genitales y ojos. Utilícelo con voltajes bajos (máximo 30 V).
- Verificar la limpieza e integridad del camión. Retire los elementos extraños en el tránsito de conducción.
Teaching strategies, practices and activities for effective education in animal welfare

References


Scientific and technological impact

Training in meatpacking plants
Interactive strategy for the development and validation of scientific protocols to evaluate animal welfare

Adroaldo José Zanella
Brazil

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used

Course in Scientific Evaluation of Animal Welfare

Introduction, context and justification for the teaching strategy, practice or activity

The course VPS5724-1/2 is taught to students enrolled in the graduate program. The students that participate present different sets of knowledge on animal welfare, health and production, which need to be taken advantage of so the approach can promote effective learning. The idea is to bring to the classroom the knowledge that exists in each student and, in a participatory manner, organize the information in a graphic format. The information gathered can be then transformed into protocols for the evaluation of welfare in practical lessons. In the classroom the protocol developed collaboratively is compared to validated protocols. A new exercise of validation using simulation with interactive videos enables a harmonization of the approaches. The information is compiled using colored stickers on posters for species of interest.

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

The objective is to familiarize students with the science of animal welfare. The idea is to identify links so that the information conveyed adds to the existing knowledge of the students.
The strategy offers the opportunity for all students to contribute to the development of evaluation protocols for animal welfare. After developing the trial protocol, they have the opportunity to apply the indicators in practical lessons and discuss the results through interactive simulations.

**Methodology**

Material and methods: posters (80 cm x 65 cm) are used to describe indicators of animal welfare in the following species: a) birds; b) wild animals; c) cattle; d) dogs; e) goats; f) horses; g) cats; h) sheep; i) rats; j) pigs; k) fish. On the poster a circle with a radius of 60 cm is drawn and divided into four quadrants. The quadrants are marked with the four areas of interest in the evaluation of animal welfare: a) good health; b) good shelter; c) good nutrition and d) good behavior. Yellow stickers are provided so that students can list the indicators based on resources to evaluate welfare, which are to be affixed to the respective quadrant. They also received pink stickers to list indicators in the quadrants based on the animals that reflect the area of interest. Students also have access to red, orange and green circular stickers that they use to determine, for each species, the risks to welfare, in their opinion, that each of the areas represent. The data are grouped and a table for the assessment of welfare is created using the LIKERT or VAS scale. With this table the students evaluate the welfare of the animals. Afterward they prepare a report that is discussed in the classroom and harmonized with the existing literature and finally validated through observations of interactive simulations.

**Animal welfare content addressed in the teaching strategy, practice or activity**

The content addressed the five freedoms, indicators of animal welfare based on resources and based on the animals. Information on physiology, behavior and epidemiological data was also included. Discussions on the validity of the indicators and the variability in the data collection that the students present. As well as how to aggregate values and harmonize the measures. During the preparation of the approach used to evaluate welfare other questions regarding the indicators were clarified and literature was recommended to allow the students to learn more about the species and themes of interest.

**Teaching results obtained**

The students developed theoretical and practical competence in evaluating the welfare of animals. In the course evaluation they felt that this methodology was very important. This methodology was tested on graduate students in various programs. The way that they relate the knowledge acquired with pre-existing knowledge is very much evident. Student feedback and a formal assessment clearly show that the learning was effective. Competitions were also held between the students with interactive simulations, whereby the effectiveness of the learning was analyzed.

**Impact of the teaching strategy, practice or activity on students, animals, community, etc.**

The practical part of implementing the welfare evaluation protocols is carried out at the production units of the University of São Paulo. The managers of the farms participate actively, offering information to the students and also contributing in the formulation of more objective questions. The evaluation process also offers opportunities for the immediate feedback to the manager of the unit on the positive and negative points of the production process regarding animal welfare.

**Conclusions/ observations/ recommendations**

The author implemented protocols for the teaching of animal welfare in the United States, at Michigan State University, using interactive scenarios. The Animal Welfare Judging/Assessment Competition (Heleski et al., 2003; Siegford et al., 2005) continues to be very important in the United States. In Norway, interactive simulations were developed by the author for assessment of animal welfare including pain in the teaching program at the Norwegian School of Veterinary Science (Ellingsen et al., 2010). The method that is now used at the University of São Paulo has benefited from previous lessons learned and has shown great promise in bringing students closer to the science of animal welfare in a practical and objective manner.
Records and evidence of use of teaching strategy, practice or activity

Posters - Participatory protocol

Data collection and assessment
Analysis, harmonization and results

References


Field assessment of the welfare of production animals

Sergio Alberto Parra
Argentina

Currently, content regarding animal welfare is recommended as a basic skill by the OIE in the education of future veterinarians. In Argentina, within the basic curriculum established for the formal veterinary and veterinary medicine programs, there are courses that address animal welfare.

Currently, at my institution, Animal Welfare is a required course within the study plans. A discipline that occurs in the sixth semester of the veterinary medicine program and is offered to students that have already acquired concepts of physiology and basic knowledge of animal production, veterinary pathology and animal science. It occurs before most of the activities that the students will conduct with the animals (clinical practice, health, etc.).

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

The profile of the veterinarian, according to the study plan for our program, has a scientific grounding and the
necessary skills and moral and creative character to work for the common good in the many different fields of the profession, which include production, animal health and public health. In this context and taking into consideration that animal welfare presents a sustainable mission in these fields, it is necessary to incorporate this discipline as part of the curriculum.

The objectives in relation to welfare for production animals are:

- Understand the basic concepts of welfare for production animals.
- Interpret problems or limitations in relation to animal welfare mentioned previously.
- Evaluate possible improvements for production animals whose welfare is compromised or reduced.
- Obtain theoretical and practical knowledge regarding animal welfare in the farming context to be able to apply it to other disciplines or subjects.
- Observe the importance of direct evaluation (products) based on the animal, as well as indirect evaluation, based on inputs or contributions and resolution of situations.
- Understand the role of the veterinarian as an educator in the livestock farming sector and his impact on the welfare of production animals.
- Reinforce clear communication, both written and oral.
- Strengthen the ability to work in teams.

Since the development of an ethogram requires a certain amount of experience and time, at the start of the practice, approximately 20 minutes are specifically dedicated to behavior assessment, so that the student can understand the basics of how to create an ethogram and what criteria should be employed.

**Evaluation of inputs and products**

A basic guide in the form of a protocol is handed out to each student with the aim of establishing, in a broad manner, some correct and incorrect approaches to welfare that they may detect in the animal evaluated.

Each group should complete this guide to be able to produce a detailed report on the assessment afterward.

The activity lasts approximately 90 minutes, and each group is accompanied by the course teacher or tutor.

After the visit, during the class seminar, each group will present their written report and give a talk on everything that they observed during the assessment, and propose improvements for the welfare of the animals evaluated.

In the same way, practical works are done to evaluate the welfare of dairy cows, in this case, on a visit to a dairy farm in the region or observing milk production at the agrotechnical school that belongs to the college itself. At this time, the animals contemplated are dairy cows, growing calves and breeding cattle.

**Methodology**

The practical is conducted on a property covering seven hectares acquired by the school and named the Academic Production Unit. On this experimental farm, tasks are conducted based on the production and raising of pigs, sheep, goats, poultry for egg laying and consumption, and other species.

Before the practical activity on welfare assessment of the production animals, general concepts on the welfare of different species of production animals and forms of evaluation (direct and indirect) are presented.

For the practical work, groups of no more than 5 students are formed, assigning to each group one of the species at the Academic Production Unit (if the number of students taking the course is large, 3 or 4 separate groups are designated for each production species).

**Animal welfare content addressed in the teaching strategy, practice or activity**


Welfare of pigs, goats, sheep and poultry. Systems and welfare. Inherent and unavoidable problems. The main
behaviors and the environment. Selection and adaptation to environment. The problems of welfare in production systems. Possible corrections.

Teaching results obtained

Applying this teaching strategy to evaluate the welfare of production animals provides the student with the chance to experience real situations in the context in which they happen.

Having direct contact with places where welfare could be compromised allows the student to interpret or implement what he’s learned in the classroom, complementing the knowledge acquired and interpretation of the topic studied.

It is important to emphasize the benefit of working in a group, where contributions from the members enrich the individual learning experience and highlight the value of the collaborative work, commonplace today, where teamwork substantially improves production yield.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

Based on conclusions formulated by students during the seminar, the animal welfare course reaches those responsible for the operations of the Academic Production Unit in the form of a report and with the aim of passing on knowledge gained from the observations collected during our activity in relation to the conditions in which the animals were found. Solutions and alternatives to improve the welfare of the animals which may be compromised are proposed.

These animals or their production, as a result of the production process, are destined for consumption, where improvements in the conditions for animal welfare enable, indirectly, an improvement in production levels and quality.

For the students, learning the most critical points to emphasize during observation of the conditions of welfare of production animals is very useful for those who will dedicate themselves to the field of animal production, enabling quick detection of anomalies in the system. Acquiring and implementing this knowledge and practice is hugely beneficial in later courses in the program, such as in the production of small ruminants, poultry production, reproduction, clinical practice, etc.

At the end of the course, a study is carried out to evaluate the opinion of the students regarding the changes that they would make in the content as well as the methodology used. Over 75% believed the field activity was essential, affirming that, in most cases, this type of activity approximates future work that they will face as professionals.

Conclusions/ observations/ recommendations

This strategy for teaching welfare of production animals achieved the objectives proposed.

It is an enriching proposal both for the students and for the teachers and tutors of the course.

Interest from students in topics related to animal welfare and, specifically, in how to employ it on family farms is encouraged.

Although places like the Academic Production Unit cannot always be found to hold activities with all the groups of students, each group of students could be assigned a specific production species and visit a private production establishment, carry out the work plan and corresponding assessment, and then relate the experience to the class in a seminar.
Records and evidence of use of teaching strategy, practice or activity

Execution of Practical Work

**Guía para la evaluar el bienestar de los animales de la Unidad Académico Productiva (UAP)**

1. Realizar un registro de los diferentes comportamientos (Etograma) de los animales en el sistema asignado.

   Registrar los acontecimientos por un lapso de aproximadamente 20 (veinte) minutos de manera continua.

   Tener presente que se deben registrar todo tipo de actividades que efectúen los animales, como así también la duración de las mismas.

2. La aplicación de esta guía básica es de utilidad a los fines de establecer, a grandes rasgos, algunos aciertos y errores de bienestar animal que se podrían detectar en la práctica pecuaria que estamos evaluando.

   Dado que el bienestar animal es un concepto multidimensional, cuando queremos medirlo en un establecimiento, hay que considerar todas las variables, que a nuestro criterio, resultan indispensables a la hora de emitir un juicio con respecto al estado de bienestar de los animales alojados en el mismo.

   En base a la observación ejecutar una evaluación de Insumos y Productos, reconociendo todo lo que se considere de relevancia.

   A continuación se esboza un listado mínimo de criterios y variables a ser medidos para realizar una evaluación general.

**Datos generales:**

Fecha de la visita: 

Lugar: 

Tipo de explotación: 

Nº de animales: 

<table>
<thead>
<tr>
<th>Categoría</th>
<th>Número</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Ejemplos: Lechones, madres, machos adultos, etc; Pollitos, pollos parrilleros, gallinas ponedoras, etc.)</td>
<td></td>
</tr>
</tbody>
</table>

**Fecha de la visita: ..
Lugar: .............
Tipo de explotación: ...............
References


Farm Animal Welfare Education Centre. (2012). Ficha técnica sobre bienestar en animales de granja. ¿Qué es el Bienestar Animal?. FAWEC.

Farm Animal Welfare Education Centre. (2012). Ficha técnica sobre bienestar de animales de granja. Requerimientos legales sobre bienestar en explotaciones de porcino. FAWEC.

Farm Animal Welfare Education Centre. (2013). Ficha técnica sobre bienestar de animales de granja. Estrés en los animales de granja: concepto y efecto sobre la producción. FAWEC.


Identification of behavioral problems in horses that pull carts in Bogotá, Colombia, as an indicator of animal welfare, and organization of a Health Brigade for horses

Juan David Córdoba Parra
Colombia

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used
Animal Welfare Research Group - U.D.C.A

Introduction, context and justification for the teaching strategy, practice or activity
In Colombia, law no. 769 of 2002 established the removal of animal-drawn vehicles, and cities must provide alternative activities for the people who make their living from this type of vehicle.

Part of this project is the reception, care and adoption of the animals, led by the City of Bogotá, by introducing the campaign "Adopt a friend," directed at people with the financial means and land to adopt these animals.

The University of Applied and Environmental Sciences [U.D.C.A] became associated with this initiative to receive a group of 1,200 animals during the adoption process before they are delivered to a definitive home.

U.D.C.A is committed to Animal Welfare. This commitment is reflected by the university’s participation in exhibitions and forums on bioethics and welfare. The institution also collaborated in the National and International Seminar on Animal Welfare (2001 and 2011) and included the animal welfare course in 2001.

The university created the Animal Welfare Research Group, composed of academics and students who work to promote animal welfare for different animal species. Student participation is essential to the development of extension work and research. In addition, membership in the group is voluntary with no ties to any academic program, and the time dedicated is done so with great responsibility and passion.
To maximize the acquisition of knowledge, there are different styles of learning, and the group strives to work on topics of collective interest, proposals from a roundtable with members, analyzing the pertinence of each idea and its sociocultural impact, its viability and selecting the members of the team according to their level of interest.

The research project “Identification of behavioral problems in horses that pull carts in Bogotá, Colombia, as an indicator of animal welfare,” used the learning model “learning by doing (active experimentation and concrete experimentation)” that, according to Barros (2011), promotes learning through active participation by the student and interaction with the subject matter and techniques. In addition, it promotes the assimilation of new information (becoming acquainted with each of the behavioral changes by previewing the subject matter), the processing of this information and the execution of the associations (all the ways that the animal can express the same behavioral change), in a pragmatic and thoughtful exercise.

The activity “Health Brigade for Horses” consisted of a visit, with students, to where 20 horses, kept in sub-optimal conditions, were rescued from a small corral in Suba. According to Barros (2011), this learning model is “Different, learning by feel (concrete experience and reflective observation).” The student learns about the mistreatment of horses, thus recognizing the importance of the theme and the search for solutions.

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

Overall objective

Strengthen attitudes and aptitudes of students working in teams, on research, development and acquisition of scientific knowledge regarding behavioral changes in horses that pull carts in Bogotá Colombia, as an indicator of animal welfare, theoretical and practical application of assessment of animal welfare and patient approach in the Health Brigade for Horses.

Specific objectives

- Learn to find appropriate, up-to-date and valid scientific information on a theme that provides personal motivation and desire to learn and apply that knowledge.
- Develop critical analysis based on reading.
- Structure and form own judgment during the performance of the activities (estimating the behavioral changes in horses and offering clinical care for the animals of the Health Brigade).
- Promote discussion based on own experience and from that reported in the scientific literature.
- Integrate all the knowledge and experience to actively pass it on, with the aim of disseminating knowledge and motivating colleagues to become involved in future projects.

Abilities

- The students become more responsible and committed with the tasks assigned.
- The students develop abilities in oral communication, analysis and relating concepts.
- Promotion of a critical and reflexive attitude to their own learning process.
- Collaborative work was strengthened.
- The activities promoted debate and discussion, and strengthened arguments.
- Skills concerning clinical approach and patient management were also improved.

Methodology

The research project “Identification of behavioral problems in horses that pull carts in Bogotá Colombia, as an indicator of animal welfare,” was formed by a group of three students at the School of Livestock Sciences, in view of their interest in horses, their interest in animal welfare and their willingness and interest to work on the project.

Later, scientific literature was given to the students regarding the behavioral changes in horses (Tadiche and Araya, 2010) to introduce them to the subject. Periodic meetings were held to answer questions regarding the assigned reading. Later, a sampling of the animals was initiated (which, at the end of the study, totaled 1,325), starting with teacher-assisted field training to teach students data collection protocol, animal handling and information recordkeeping.

The students monitored the sample of 1,325 animals from February 2013 to March 2014, taking samples every week. They worked together to tabulate the information in Microsoft Office Excel®, process and analyze the results and elaborate discussions.

Likewise, the students participated in three different research seminars (V and VI institutional seminar of U.D.C.A.
research groups, and VII regional seminar of research groups), presenting their preliminary findings.

In this manner, the method “active experimentation and concrete experimentation,” mentioned previously was employed.

Health brigade for Horses: the Animal Welfare Group, the Horse Research Group and the teacher-coordinators went to Humedal Juan Amarillo, in Bogotá, on March 11 in an operation (or brigade) to rescue and recuperate poorly kept horses used to pull carts, which received clinical care and were taken to the UDCA.

Approximately 40 students participated in this field project. Students in veterinary medicine and animal sciences from different years who were interested in the species, animal welfare and in solving problems of mistreatment for work horses took part. The students participated in the health brigade in teams, with guidance from teachers and the veterinary professionals, carrying out clinical assessments of the patients. Here the students learn using the method “concrete experience and reflexive observation.”

Results of the research project include students gaining in-depth knowledge of specific scientific themes, public speaking skills, ability to disseminate knowledge and a passion for research, in view of the fact they want to be associated with other projects.

The results of the health brigade include recognition of the clinical approach and safe patient handling.

Animal welfare content addressed in the teaching strategy, practice or activity

The Animal Welfare Group focuses on activities in extension, research and teaching in line with the five freedoms and the needs of the animals. For this reason, the different activities integrate the knowledge of these needs in the different species and how to address them in a scientific and compassionate manner, considering respect for animals and life as a fundamental element and operational guideline for the group.

The project “Identification of behavioral problems in horses that pull carts in Bogotá, Colombia, as an indicator of animal welfare” was based on a review and approach using the five freedoms in horses, which are affected by the specific conditions of housing and handling where this group of animals is kept.

On the other hand, the animal welfare operation conducted to care for these work horses was based on an evaluation of the freedoms: freedom from hunger and thirst; freedom from pain, injury and disease; freedom from fear and distress (WSPA, 2007). An assessment of the body condition and a general clinical exam were conducted, as well as an assessment of the absence of discomfort (evaluating characteristics of infrastructure where the animals were housed) and the freedom to express natural behavior (evaluating the handling to which they were submitted).

Teaching results obtained

From the project:

- Greater commitment, responsibility and dedication to the project.
- Attitude and aptitude for research.
- Ability to search for scientific information and the correct use of university databases.
- Critical analysis of scientific documents.
- Organization of information.
- Analysis of results, discussion and development of knowledge.
- Recognition of the importance of the methodological order for collection of samples.
- Strengthening of interpersonal relations.
- Confidence and self-assuredness when making presentations in public.
- Participation in different research events.
- Interest in continuing to learn more about the subject and a desire to research others.

From the Health Brigade:

- Awareness and recognition of the mistreatment of specific animals to the detriment of the five freedoms of animal welfare.
- Development of skills in the handling of patients.
- Learning about physician – owner interaction.
- Strengthening knowledge of semiological exploration and complete clinical exam of the patient, conducted on real patients.
- Knowledge and practice of some palliative therapeutic approaches for horse patients. These techniques
include therapies with fluids for rehydration and the administration of vitamins.

- Provision of clinical veterinary care as part of the promotion of welfare in work animals.

**Impact of the teaching strategy, practice or activity on students, animals, community, etc.**

The impact of the project:

On students:

- Increased in knowledge, self-knowledge and practice.
- More in-depth understanding of the importance of horse welfare based on behavioral change.
- Awareness of the importance of animal welfare as an essential component so that humans, animals and the environment can live in harmony, and the responsibility of man to achieve this goal.
- Recognition on a local and regional level as a research team on the theme of welfare.

On the animals:

- Recognition of the different behavioral diseases when determining therapeutic approach.
- Clinical and ethological care of the animals when conducting clinical exam.

On the community:

- Use of horses in animal traction vehicles has been a significant socio-cultural problem in Bogotá. It was initially addressed in a city action plan and implemented starting in 2012. Support from the communities, the owners of the animals, the police, the city of Bogotá, the educational communities and the general public was necessary to achieve the goal of prohibiting the use of animals as animal traction vehicles in the city. The achievement of this macro project influenced the thinking on the responsibility of man with animals and our surroundings, for a more harmonious coexistence and a place where animal resources are not exploited, and new technologies can be used to replace them.
- The behavioral changes were recognized as important diseases, like physical changes, in the animals used as animal traction vehicles.

The impact of the health brigade

On students:

- Increase in knowledge, self-knowledge and practice.
- Awareness of the role of the veterinarian and his responsibility to act to promote the welfare of horses and other species.

Recognition of animal welfare as part of the practice of veterinary medicine.

- Recognition of the appropriate approach, examination, diagnosis, prognosis and decision-making under specific conditions, as in the case of the mistreated animals.

On the animals:

- Successful clinical recuperation of all cases.
- Improved quality of life.

On the community:

- The community reported the poor conditions to the authorities, requesting immediate action to recuperate the animals. As such, it is evident that the residents of the city are especially concerned with the issue and are motivated to collaborate on the welfare of the animals, with intermediation from other entities that facilitate closer relations, the approach in these cases, apprehension of the animals, veterinary care and referral for adoption.

**Conclusions/ observations/ recommendations**

The general conclusions of these activities that involve research and extension are:

Man domesticated horses and has the moral responsibility to care for and promote their health and welfare.

The students played an essential role in promoting collective good through their participation in specific actions, in this case the welfare of the horses.

The students delved deeper into different areas of knowledge, including animal welfare, semiology, medicine, therapy, etc.
The students recognize the importance of scientific research as a structural pillar of education and as a true source of knowledge.

The animals received a clinical examination in search of different diseases for diagnosis, prognosis and treatment, with the aim of recuperating any change or pathology and offering better living conditions.

The community in general showed interest in participating in the animal recovery activities, as a result of public awareness of the sociocultural problem of the animal traction vehicles and the awareness of animal welfare and man’s obligation in this respect.

The first step to addressing animal welfare is to contextualize the problem from all points of view, raise the awareness of the groups of people to carry out the activities completely and responsibly, and achieve the objectives and the goals proposed.

Records and evidence of use of teaching strategy, practice or activity

Regional Research Group Seminar and Researchers Seminar
Health Brigade for Horses

References


Teaching animal welfare in animal science

Priscila Cotta Palhares
Brazil

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used
Ethology and Animal Welfare

Introduction, context and justification for the teaching strategy, practice or activity
Animal science has played an extremely important social role since it was regulated as an undergraduate program by Law no. 5550 on December 4, 1968 by generating employment in various sectors, such as the husbandry and administration of poultry, pigs, cattle, goats, sheep, forage, pastures, horses, fish, bees, rabbits, wild animals and pets, the environment, fertility, handling and conservation of soil and mechanization and agricultural implements. In recent decades animal science has faced enormous challenges to continue producing products of animal origin. In this context issues concerning animal welfare, environmental pollution and food safety have emerged. It is known that improper handling, in addition to causing unnecessary stress and suffering, directly affects the quality of meat through factors such as color, pH, texture and shelf life of the product, in addition to significantly reducing the yield of the carcass.

Because this profession is directly related to animal production, it is of fundamental importance that this professional is well prepared to deal with the management of animals, in view of the production associated with animal welfare, when he leaves the educational institution. For this to occur, measures of welfare must be introduced at the start of the program, so that the student can familiarize himself with the application of these concepts as he learns about the different types of animal production.

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity
To ensure that animal welfare is applied appropriately it is necessary that the future professionals in these fields understand clearly how these measures are applied, in order to obtain production results without harming an animal’s quality of life.
This practical teaching methodology for animal welfare is aimed at familiarizing students in animal science programs, through investigative approaches, with measures of animal welfare and their applications. Another objective is to encourage students to apply the measures in a rational manner without being imposing or radical, since they will come into direct contact with producers with various levels of knowledge and traditional management practices in different areas of animal production. In addition to helping to introduce the practice of identifying and describing animal behavior. And also, continuously promoting the use of animal welfare measures in production.

**Methodology**

This methodology can be used by any institution and for any animal science program, on a graduate or undergraduate level, and the duration can be adjusted according to the time available for the discipline. The students are evaluated on the reports they submit. Initially, the class should be divided into pairs, or groups of three or more, depending on the size of the class. Next, each group will determine on their own (or by drawing lots), the species and phase of life that they will work on. The project will be carried out in two stages as detailed below:

1. Observation of the animal behavior chosen and the creation of an ethogram: [14 days] Two students must make daily observations of approximately 2 hours, twice a day (mornings and afternoons), for 10 days, of the behavior of the animal chosen, in the production phase selected. They should be instructed to wait 1.5 to 30 minutes after their arrival to begin observation, as animals may be frightened by their arrival. This can happen when animals do not have frequent contact with handlers. Each day of observation, the behavioral information should be written down, to enable the drafting of an ethogram (which has been previously explained to students).

2. Description of the handling employed: [7 days] student should observe and describe in a detailed manner the handling that these animals receive.

3. Literature review of the natural behavior of the animal in question during the phase of life chosen. [7 days]

4. Literature review of the measures of animal welfare for the animal species and the production phase chosen, in accordance with national and international norms. [7 days]

5. Report correlating the handling observed and the recommended welfare practices for the handling in the phase of life and animal species chosen. [7 days]

6. A report with possible solutions to resolve the problems encountered in the evaluation of the farming practices. [7 days]

7. Roundtable to discuss the problems encountered and strategies developed to resolve them. (1 day) Students should take all the material and everything they’ve learned to the student roundtable, where the teacher will serve as the mediator for the discussion. This is used to improve the solutions suggested for the problems found.

8. Apply solutions (in accordance with the circumstances encountered) and observe the behavior of the animals. (14 days) Students should introduce one or more of the solutions suggested to resolve the problem found and monitor results, as done in phase 1.

9. Draft a report on the results obtained for the project. (7 days)

10. Prepare and present a seminar for an academic association, producers, secondary schools and/or consumers of a product of animal origin. (21 days) Each group will develop a seminar on animal welfare using the experience they gained through the activity and select (or draw lots for) an institution, event or public location for presentation.

**Animal welfare content addressed in the teaching strategy, practice or activity**

Definitions of animal welfare and related concepts;

Tools used in the assessment of animal welfare (animal welfare indicators); behavioral indicators of animal welfare; environmental effects on animal welfare; assessment of animal welfare; importance of animal welfare and society; welfare of production animals and welfare of pets.

**Teaching results obtained**

- Awareness by the students of the importance of animal welfare;
- Learning about how to assess conditions animal welfare in different types of production;
- Learning how to apply measures of welfare for two different animal species;
- Learn to disseminate education on animal welfare to laypeople;
• Develop ethograms for animal welfare.
• Develop a critical sense and ability to find solutions.
• Develop the skill of conveying knowledge acquired in a clear and objective manner without being radical.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

Greater awareness of the importance of animal welfare for students, teachers, rural producers, consumers of foods of animal origin and by society.

Raise the interest of students in animal welfare measures, so that they are able to apply these concepts and measures as a complement to learning in various disciplines taken during the program.

Encourage a critical sense of all of those involved, so that they are able to observe the animals at any time and be able to identify the absence of welfare. As well as being able to resolve these situations, whether directly or by directing others.

That the students are capable of promoting animal welfare and disseminating knowledge contained in the discipline and in the teaching practice to producers during internships and other events, and after they graduate.

Conclusions/ observations/ recommendations

This teaching practice was aimed at contributing and promoting animal welfare through the learning of students of animal science programs. And this can be achieved by using practical teaching strategies, placing the students to actively observe welfare deficiencies, and apply animal welfare measures for different species. This also allows them to promote animal welfare as students and as professionals, since they have gained greater awareness of the importance of these measures in production and the quality of life of the animals.

This teaching practice can be employed in various educational environments: in production on properties associated with educational institutions, in production associated with the educational institution itself or even in the production or animals raised by the students themselves. Which boosts the development and results of the project.

References


Teaching strategies, practices and activities for effective education in animal welfare
Chapter 2

Strategies and teaching practices oriented to the teaching of animal welfare in small animals and responsible pet ownership
Carmen Luz Barrios Gómez
Chile

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used

Course in Ethology and Animal Welfare

Introduction, context and justification for the teaching strategy, practice or activity

Currently, in Chile there are approximately 3.4 million dogs, of which 1.4 million reside in the capital. Of those residing in the capital, it is estimated that 52.4% are community dogs and 21.9% have no owner. Most of these animals that move daily though the streets fail to meet even the minimum standards of animal welfare, and create various problems: indiscriminate reproduction, traffic deaths, malnutrition, diseases, etc. At present, Chile does not have a policy to control dog populations that solves the problem on a national level. Individuals and NGOs working with animal protection have created a significant number of shelters for dogs and cats, where, despite their good intentions, in many cases, they do not have the resources to maintain adequate levels of animal welfare, and the animals suffer from behavioral problems as a consequence of the absence of environmental stimuli due to prolonged periods of confinement, which will affect them upon re-abandonment and reduce the quality of living conditions during the animal’s stay in the shelter. In view of this situation, a “Workshop on environmental enrichment for animals in shelters” was introduced into the course Ethology and Animal Welfare in the School of Veterinary Medicine at the Mayor University of Chile, where the students visit a shelter and assess the behavioral needs that are not satisfied at the location, and develop an item for environmental enrichment. Here the objective is to apply the knowledge acquired in the course Ethology and Animal Welfare, which includes: Behavior of cats and dogs, Definition of Animal Welfare, Indicators of welfare in pets, Scientific assessment of animal welfare, Frequent problems presented by pets, Environmental enrichment in the same species and recognition of the role and the limitations of shelters for pets. The students visit a shelter where they assess the
behavioral needs of the animals. Later, they attend two workshops, where they create an item for environmental enrichment. Finally, a second visit is made to install the elements in the shelter.

**Objetivos, competencias e iObjectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity**

This teaching initiative is aimed at integrating and applying animal welfare knowledge for pets in the course Ethology and Animal Welfare, that the students of veterinary medicine at the Mayor University take in their third semester, by assessing the environmental enrichment conditions that the cats and dogs experience in the shelter “Unión de Amigos de los Animais,” identifying needs and proposing alternative solutions.

The key to this initiative is the assessment of the conditions of animal welfare and the implementation of a measure to improve the facilities through environmental enrichment. The exercise was evaluated based on two tasks: creation of a toy for environmental enrichment and drafting of a report to justify the activity.

**Methodology**

Description of the activity: part of the course Ethology and Animal Welfare, which is given in the third semester of the veterinary medicine program. The entire course is 90 hours in length and the workshop 30 hours, which is divided into 16 hours of theory and 6 hours of workshop, the latter for building the elements of enrichment after the assessment visit, and 8 hours of work in the field.

The activity is divided into 5 stages: 

1. **Student training stage:** The students attend different classes that provide a basis for the analytical assessment and the building of the environmental enrichment item. In these classes the following themes are introduced: Clinical Ethology: cats and dogs, Introduction to Animal Welfare and Problems of welfare in pets – Environmental enrichment. Similarly, the students receive two introductory lessons to help them focus on the appropriate points during the assessment, and the assessment criteria that will be considered both for its informative value and for the building of the environmental enrichment item.

2. **Shelter assessment visit:** The students assess the conditions of animal welfare at the shelter. To do so, they use behavioral indicators of animal welfare, complemented by information collected regarding the environment.

3. **Workshop sessions for the building of the enrichment toys:** The students, in groups of four, search for complementary information and gather the necessary material to build the toys (one for dogs and the other for cats), meeting with two professors, which are charged with directing the construction of the enrichment elements, answering questions that the students may have and handing out a written guide (Annex 1).

4. **Drafting the report:** The report contains the following elements: Introduction, justification of the construction of the environmental enrichment element, discussion and conclusions. Evidence of the assimilation of the knowledge acquired. Photos of the elements built and of the animals using them should also be included.

5. **Visit to install the toys:** Finally, a second visit to the shelter is made, when the toys are delivered and employed. Materials for the creation of the environmental enrichment item: ideally recyclable materials are considered like: plastic bottles, pieces of carpet, etc. Finally, three professionals supervise the previous phases, which are spread over different stages of education.

**Grading process:** The students are graded with two scores, one that evaluates the building of the environmental enrichment (Annex 2) and the other that evaluates the report (Annex 3).

**Animal welfare content addressed in the teaching strategy, practice or activity**

The present activity includes the themes:

- Methods for studying animal behavior: methods of sampling and recording behavior (Unit I: Introduction to Ethology).
- Behavior of cats and dogs (Unit II: Applied Ethology)
- Introduction to the science of Animal Welfare (Unit III: Animal Welfare)
- Behavioral indicators of animal welfare (Unit III)

**Teaching results obtained**

Students assess the conditions of animal welfare at the shelter. This learning outcome is initially addressed in the assessment process carried out by the student for the conditions in which the animals are found, and continued in the drafting of a complete report, where initially a litera-
ture review is necessary to enable the student to justify the construction of the enrichment element. All of this after an analysis of the information found in the literature, the lessons and fieldwork.

Integrate knowledge of animal welfare in the users/patients of the shelter: This learning outcome was addressed both in the building of the toy and in the drafting of the report. After the field assessment, the student must assimilate the knowledge and apply it to create and install the enriching element that fulfills all of the necessary characteristics for each of the species and, at the same time, that meets the behavioral needs of an animal confined for a prolonged period of time.

Justify the selection of the environmental enrichment elements created on the animals in the shelter: Justification of the choice of the enriching element will consolidate the work done previously and will show an understanding of the information received regarding animal welfare.

**Impact of the teaching strategy, practice or activity on students, animals, community, etc.**

This activity has a direct impact on the students participating in the activity and on the animals that receive the elements created during the lessons, and, indirectly, on the team responsible at the animal shelter and on the future owners of the animals. Next, a table with the main impact indicators of this teaching experience is created.

Impact indicators: “Workshop on environmental enrichment in animals housed in a shelter,” 95 students, 8 members of the shelter team “Unión de Amigos de los animales,” 40 cats, 95 dogs, 20 adopters.

In addition, a group of 7 students initiated a project in a shelter motivated by the activity, called AMIDOGS. It is supported by professionals of the Department of Ethology and Animal Welfare at Mayor University.

**Conclusions/ observations/ recommendations**

Conclusions: The integration of knowledge acquired in the classroom was facilitated by this type of field practice, all of this the result of being able to create a situation to assess animal welfare and then propose solutions.

It is important to incorporate analytical exercises to ensure full assimilation of knowledge acquired by the students in each of the training stages.

The practical field experiences are very useful to improve the problem-solving skills of the students, which is one of the main focuses of preparing a complete professional.

The educational activities in which the students feel involved in making a concrete social contribution (demonstrating the use of their work to society) maximizes their dedication to the work and improves the performance of the team.

The educational activities in animal welfare that incorporate social stages increase the impact of the intervention, reaping benefits from this course outside the classroom and strengthening the link of the students with the community.

Recommendations: to ensure that the teaching activity is successful and reaches its full potential, teachers should structure and write down instructions for the work. If they do not, they run the risk of the students not achieving the desired objective.

To achieve greater commitment to the educational intervention, it is essential to introduce the problem in its entirety and, ideally, in person (visiting the animals that will be assessed).

Video presentations of previous experiences with students from other classes and the success obtained with other elements increase the enthusiasm of the new participants.

The positive feedback from the people who receive the intervention by the group of professionals that organize the activity and by the students is fundamental to promote the involvement of students and teachers in this type of activity. This is why interaction is suggested between a representative of the organization where the welfare measures are applied and the class participating in the educational activity.

It is a good idea to keep a record of elements that were built in previous years that contain desirable characteristics to be able to show them to future classes to serve as a guide for doing better work. Similarly, recording previous work that presents evidence of recurring errors may prevent students from making the same errors.
Records and evidence of use of teaching strategy, practice or activity

Methodology annexes

Anexo 1: Pauta de trabajo. Taller de Enriquecimiento ambiental en especies menores.


1. Buscar y recoger información relacionada con enriquecimiento ambiental en animales en confinamiento, especialmente en perros y gatos.
2. Luego deberán determinar que juguete construirán para perros y para gatos (1 para cada uno).
3. A continuación comenzarán con la construcción de los elementos seleccionados.
4. Finalmente deberán desarrollar un informe, el cual se entregará el mismo día que el juguete. Este trabajo deberá contar con los siguientes:
   - Introducción
   - Justificación de la selección del juguete (uno para perro y otro para gato, con fotos y si quieren con videos)
   - Discusión
   - Conclusiones

*La entrega del trabajo (informe + juguete) se realizará el día Viernes 20 de junio del 2014, en la oficina de Ectología y Bienestar Animal en el 4to piso del edificio corporativo.

Anexo 2: Pauta de evaluación del juguete de enriquecimiento

<table>
<thead>
<tr>
<th>Items de evaluación</th>
<th>Parcialmente Logrado (1 pto.)</th>
<th>Moderadamente Logrado (2 pto.)</th>
<th>Totalmente Logrado (3 pto.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Originalidad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistencia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interés para la especie</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seguridad del material</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Anexo 3: Pauta de evaluación del informe escrito

<table>
<thead>
<tr>
<th>Items de evaluación</th>
<th>Parcialmente Logrado (1 pto.)</th>
<th>Moderadamente Logrado (2 pto.)</th>
<th>Totalmente Logrado (3 pto.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redacción</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estructura</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacidad de análisis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calidad de las referencias</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Academic and training activities - “Workshop”
Enriching elements - toys

References


Applying animal welfare to the medical care of small animals

Ángela Olavarría Cortés
Chile

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used:
Medical Care for Small Animals

Introduction, context and justification for the teaching strategy, practice or activity

It was observed, through research and focus groups, that the students, despite their awareness of and conceptual work with welfare in previous years in courses on animal production, the basic themes of animal welfare for pets were not taught, except for obvious situations of serious mistreatment. Students are unable to recognize common situations that can promote or compromise the welfare of hospitalized animals. Against this backdrop, initially the concept of the five freedoms will be addressed to make them evident in the work of students when they focus on the area of small animals.

The objective is to change their traditional manner of viewing hospitalized animals to consider the welfare of small animals already hospitalized, in check-ups and work dogs. They should be aware of all of the actions that are taken with the animals that they find.

In the hospital, there are three work dogs that are used to practice physical examination, and they live at the hospital facility, where they are used as examples of how animal welfare practices are applied in pets.

It is an activity that, although part of the field, is not an explicit part of the skills that need to be developed. It came about as the result of feedback on the module from students of the previous year, where a lack of integration of the animal welfare theme was noted in the training received in 2013 by the WSPA for university professors in the city of Valdivia, and interest shown in this theme by current students.

The students are in their ninth semester, of an area that is divided into ruminants, horses, production and small animals, where this activity took place. It is the
first time this activity has been fully implemented. Questions always surround the welfare of the patients, and there are many theoretical arguments that allow us to analyze the welfare of patients or search for strategies to improve situations that lack welfare. This is why work dogs were used as models for pets, to allow for the planning of corrective measures, and patients hospitalized, as an activity that will enable animal welfare to be assimilated by all students that train in the Veterinary Hospital (HCVET).

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

• Analyze animal welfare in daily procedures in the medical care of small animals, with a view to recognizing the level of welfare of hospitalized patients and work animals.

• Determine the level of knowledge achieved by students on the theme animal welfare in the medical care of small animals.

• Diagnose the level of welfare in animals in the HCVET at the Catholic University of Temuco and make relevant improvements.

• Promote professional skills in the area of animal health: by implementing routine medical and/or surgical treatments, according to standards of animal welfare and professional ethics, which enable the recuperation of individual or collective health.

• Promote transversal skills: orienting the quality of the work and the team.

• The skill of working in a team, at our university, is associated with the institutional value of fraternity. At the same time, as the individuals interact, participate and assimilate the proposals and objectives of their team, their link with the group strengthens, demonstrating integration and collaboration in an active manner in achieving common objectives with other people, areas and organizations.

• The skill of quality refers to excellence that transcends the individual and touches other spheres of life, specifically professional development, in pursuit of excellent results in each of the efforts and systemizing learning on a permanent basis. The latter enables people to continuously improve the processes under their responsibility to be able to face a globalized world in constant change, exhibiting a constant pursuit of excellence in professional management through continuous self-evaluation, planning and management of processes, aimed at achieving quality results.

The objective is that students take responsibility for developing their knowledge, creating work teams that achieve the best solution to problems that emerge in the clinical care of small animals.

Methodology

Collaborative work, class divided into four groups, each group with six sets of three students, where each group performs a diagnosis of the theme received and submits a proposal to resolve it, including the welfare of patients in the small animal clinic. Time is set aside for discussion in groups and sharing of documents over the Internet. The proposals are shared by each group in the course and corrected based on feedback for the entire course.

The objective is that, during the second semester, the proposals from each group can be implemented in a test phase, to analyze and improve them, on an ongoing basis in the hospital during the year 2015 and beyond. It takes a year to implement the initiatives that promote animal welfare for the hospitalized patients.

Group 1: develop an animal welfare record for hospital patients. This hospital record should be tested and adjusted depending on feedback and then put into practice. The objective is to ensure that appropriate conditions are provided for the hospital patients.

Group 2: analyze the welfare and make suggestions for changes to the environment for the hospital work animals. The work animals used in previous classes reside, on a permanent basis, at the HCVET facilities. Despite having excellent lodgings and sanitary handling, we want to improve the conditions as much as possible. In addition to the diagnostic phase, improvements will be implemented, including any construction deemed necessary.

Group 3: analysis of animal welfare in hospital facilities for cats and implementation of the concept of environmental enrichment. The concept of environmental enrichment for the welfare of hospitalized animals should be assured. With improved conditions the mental state of the hospitalized cats is likely to recover more quickly, while making them easier to handle. This group will build elements that will allow the cats to entertain themselves and hide themselves during their stay, respecting the space that cats need.

Group 4: analysis of animal welfare and hospital facilities for dogs and the concept of responsible ownership. The focus of the work is to provide education on the responsible ownership of pets, creating instruments that help owners understand the responsibilities that
they assume when they have a pet. In addition, this group will teach the basic level (levels 1 to 4).

For the entire period, an open door policy was established to discuss the progress of each group and contribute to the improvements that could be implemented immediately, in an activity that began in April 2014 and ended in June 2014.

A lecture is planned with an environmental inspector who will talk about the legal mechanisms that exist to report the mistreatment of animals and deficiencies in animal welfare, in view of the legal changes that have occurred recently in Chile.

Animal welfare content addressed in the teaching strategy, practice or activity

Generalities, conceptual framework, five freedoms, responsible ownership of pets, legislation on animal welfare, physiological aspects of pain and stress and animals, role of professional and animal welfare.

Teaching results obtained

It is a strategy that is developed during the semester. The steps include:

1. First draft of the animal welfare record used to analyze hospitalized patients. The objective is that this record becomes visible to students who pass through the veterinary hospital, that the activities carried out with patients are related to some of the freedoms and that treating them well goes beyond empathy, but rather a duty associated with the welfare of the patient.

2. Diagnosis of the environment for work dogs, which despite complying with animal welfare, can be improved. Plans are being made to improve the lodgings, to provide a space for play and students are already aware that walking the dogs is necessary for their physical and mental health. Students walk the dogs two or three times a day every day. The change in attitude of the students in relation to work dogs is visible, and the dogs are calmer. A commitment to the mental health of the work dogs was achieved.

3. The diagnosis of the hospital for cats led to the planning of sweeping changes that should be implemented in the lodgings of the hospitalized cats. The environment is being enriched, with the creation of disposable toys, aromatherapy and musical therapy, which has already been implemented and achieved good results.

In the hospital for dogs, changes have yet to be implemented due to time constraints for the students, but this group is committed to the semester work of their colleagues and have provided feedback on the work of other groups, contributing to improvements that are being implemented. The educational lectures will be held at the end of the semester, and contact is being made to provide access to elementary school students.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

On the students: keeping them motivated with a theme that they know exists, but one that they believe they don’t apply, like animal welfare, changing their views of activities conducted in clinical practice, taking responsibility for the mental health of the patient. Students who worked in teams to build and create spaces for hospitalized and work animals showed greater motivation. They presented a project to the student initiative fund associated with the welfare of hospitalized animal patients.

On the animals: in the case of the work dogs, there was an improvement in their environment, with environmental enrichment and, above all, an improvement in their mental health; the students became aware of the need to walk the animals as an enjoyable activity, taking turns walking them two or three times a day. The animals are much calmer and more balanced than before.

The hospitalized cats have a more pleasant environment in the hospital, which facilitates their handling because they are more relaxed.

On the school: the record developed is enabling access to basic concepts of animal welfare by younger students who pass through the hospital.

Support from the administrators of the program for costs associated with the improvements that the students requested for each work area.

Although the project is incipient, it has fostered a process of self-evaluation and change in the curriculum by integrating concepts more explicitly than before.
Conclusions/ observations/ recommendations
The application of the concepts makes the students visualize and internalize learning, making it meaningful to them.

Emphasis was placed on the theme animal welfare in the Catholic University of Temuco School of Veterinary Medicine, and has been submitted to analysis for the creation of a new curriculum.

Records and evidence of use of teaching strategy, practice or activity
Analysis of animal welfare and the record for hospitalized patients
Work in teams and collaborative integration

Work with animals and implementation of improvements for welfare

References
Curso WSPA para docentes universitarios, Universidad Austral de Chile 2013.
Lectures on Responsible Pet Ownership

Graciela Estrada Dávila
Ecuador

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used
Ethology and Animal Welfare

Introduction, context and justification for the teaching strategy, practice or activity

The Responsible Ownership Program at UDLA is a collaborative effort organized by Prof. Graciela Estrada, a veterinarian, who works in conjunction with nine students in their fourth to sixth semesters, who, in turn, coordinate the students that are currently studying Ethology and Animal Welfare (third semester). These students form groups of five and are charged with giving lectures on responsible ownership, which is one of the requirements for passing the course. This task is part of a relationship project with society sponsored by the veterinary and animal science department.

The present project is justified by the evident need to teach the Ecuadorian public about their implicit responsibility to care for an animal as part of the family (pet), since it is easy to find polarized examples of care: anthropomorphism and mistreatment.

The strategy focuses on a process of participatory learning to establish a link between the university students and the elementary school students. The third semester veterinary students give entertaining lectures, based on the five freedoms, to fourth grade elementary school students, at both public and private schools, since they will have the greatest impact on the actions of their parents. They are the ones who will teach them how to better care for a pet. At the end of the lecture, the students sign a pledge and they receive a button with the logo of the program, encouraging parents and family members ask them about the topic and, in this way, conveying the information learned in the lecture.

A faculty member accompanies each group of students to the lecture to help answer any questions and support them in conveying the information. This activity begins after the students receive introductory classes and concepts on animal well-being that are put into practice throughout the semester.
Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

The program has the following objectives:

- Disseminate the basic aspects of responsible pet ownership to society.
- Prepare upstanding students and future professionals at UDLA, who are concerned with and understand the important role they play in society.
- Encourage the students of Universidad de Las Américas to participate in the development and internalization of the subjects learned, in daily life.

Methodology

The methodology employed is based on a talk given by five students, based on the five freedoms as a scientific way of assessing the welfare of animals. This is done under the supervision and support of the teacher in charge, Graciela Estrada, and the students of the Responsible Pet Ownership Group. The lectures also contain audiovisual aids in the form of posters, Power Point presentations, and questions about the topic (students participate as assistants) as well as educational games to reinforce the information supplied during the presentation (WSPA games were used). Finally, buttons bearing the program logo are given to children, who are then charged with teaching what they learned in the lecture to their parents at home.

The students used graphics extensively to convey the information. Photos and drawings are exhibited, which are then complemented by games. Finally, a pledge is made by the children, that they will go home and teach their parents how they should responsibly care for their pets.

The following phase of the program, which is already planned for the entire year of 2015, will include the qualitative and quantitative assessment of this impact.

Animal welfare content addressed in the teaching strategy, practice or activity

The content used in the strategies is the five freedoms with the following explanation:

- Freedom from hunger and thirst. Clean water should always be available. It is necessary to follow recommendations for a balanced diet (feed) in relation to quantity and nutritional needs, in accordance with the age and physiological state of the pet. Freedom from discomfort. Animals should have enough space to walk freely. This does not mean that what is appropriate for a human being is appropriate for animals. We have to understand normal behavior and, based on this understanding, provide the necessary space for them to exhibit their normal behavior.

Teaching results obtained

In line with the objectives, it became clear that the basic aspects of responsible pet ownership are being disseminated in society.

Up until now, a total of 1,330 elementary school students have attended the lecture, at 27 educational sites inside the cities of Quito and Machachi. According to national demographics, each person belongs to a family of four, so if each child disseminates the information to their homes, around 5,320 people could potentially receive the message.

The second and third objectives were not quantified, but qualitatively it was observed that, after the presentation of the lecture, the students took a more active and participatory role in relation to communicating knowledge on animal welfare. The students who are now coordinators were selected from the group of students that have already experienced the activity.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

Since the start of the program, 1,337 children between the ages of eight and eleven have been benefited, from
27 schools of the Pichincha province, specifically from the outskirts of Quito and Machachi.

According to statistics from the National Normalization Institute (INEN), it is estimated that each person who received training belongs to a family with four members, therefore 5,348 people were potentially impacted.

Conclusions/ observations/ recommendations

The children who attended the lectures received practical knowledge on responsible pet ownership and, indirectly, their family members, and this is the greatest motivation to continue with the program and with plans for new complementary objectives, to obtain further results and a quantifiable impact.

Records and evidence of use of teaching strategy, practice or activity

Lectures on Responsible Pet Ownership

References


Chapter 3

Strategies and teaching practices promoting humanitarian use of animals in education and research
Development of models to simulate collection of blood samples and administration of intravenous drugs as humanitarian alternatives in the teaching of veterinary medicine

Edison Alberto Cardona Zuluaga y Sergio Alejandro Salas Suárez
Colombia.

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used

Courses: Physical Examination and Methods of Exploration and Introduction to Veterinary Medicine and Animal Science

Introduction, context and justification for the teaching strategy, practice or activity

In our profession, the collection of blood samples and administration of drugs or solutions to replace liquids and electrolytes is almost routine. That is why professionals need to develop the necessary dexterity and skill to competently collect samples and correctly access blood vessels. However, when developing these skills some animal rights—freedom from suffering and discomfort, pain, injury, disease, fear and distress—are consciously, though inadvertently, violated. In the teaching of veterinary medicine, despite the care and respect for animals, practices like these violate their freedoms because any action, deliberate or not, that affects the current or future welfare of the animal with the aim of learning by the student is a harmful approach («Alternatives Brochure Spanish tcm46 33730 pdf free ebook download», s. f.). Modern universities should prepare their students to ply their trade in a suitable manner. A dual perspective on the educational process is therefore fundamental: how our students learn and, as a consequence, what and how they are taught (Ruiz Esteban, 2002). Historically, live animals were used in the teaching of veterinary procedures. However, in the past decade, new technologies have been produced, such as manuals, videos, images and virtual reality simulators, in an effort to develop skills and dexterity in students (Perez-Rivero & Rendón-Franco, 2011). For human medicine, high-precision simulators have been developed in recent years (Fletcher, Militello, Schoeffler & Rogers, 2012).
Teaching strategies, practices and activities for effective education in animal welfare

Unfortunately, the simulators are unaffordable for some academic institutions. For these reasons, the development of portable, easy-to-manufacture, low-cost animal science simulators is justified. The objective of this teaching strategy was to develop simulators for venipuncture, venous access and collection of blood samples in dogs, cats, horses and cattle, to allow students of livestock sciences to acquire dexterity, to increase the number of successful interventions on live animals and reduce the stress, fear, pain and suffering to which they can be submitted in this type of academic practice.

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

The objective of this teaching strategy was to develop simulators for venipuncture, venous access and collection of blood samples in dogs, cats, horses and cattle, to allow to students of livestock sciences to acquire dexterity, to increase the number of successful interventions on live animals and reduce the stress, fear, pain and suffering to which they can be submitted in this type of academic practice.

Skills and teaching aim:

- Acquisition of skills and dexterity in the collection of samples, administration of drugs and venous access in different animal species.
- Learn standard techniques for collecting blood samples; use of disinfection, tourniquet, hemostasis and safe handling of patients.
- Appropriate handling of devices for venipuncture: vacutainer system, syringes, needles, catheters, venoclysis, use of gloves and final disposal of hospital waste.
- Learning based on handling and humanitarian physical restraint of the animals.
- Reduce the use of animals in education and learning, substituting initial direct intervention with venipuncture simulators, by first refining skills to reduce the pain caused to animals by reducing the amount of direct intervention (3Rs principle).
- The development of simulation models as an educational tool creates a stimulating environment for education and learning that facilitates access to cognitive structures.

Methodology

This project uses a constructivist teaching tool to create an environment that stimulates experience and facilitates access to cognitive structures (Flórez Ochoa, 2005). Physical models of venous access points were developed for the different species of domesticated animals, striving for models that were anatomically correct and felt real to the touch, with similar textures and physical proportions to the real patients through the use of materials like latex tubing, textured and printed screens that simulate the skin of the animals, pumps to move the fluid and preparation of pigmented fluid to imitate blood, using wooden structures covered in foam. The vascular circuits are fed through venoclysis connected to squeeze and release pumps that keep the fluids moving.

Before the use of the simulation models, students are given master classes with images and videos where they learn about patient handling, surface anatomy, handling and disinfection of the venipuncture area, recommendations for the collection and manipulation of samples, venous access, administration of drugs, use and choice of intervention elements (needles, syringes, catheters, venoclysis, disinfectants, etc.).

During the practical, the student is taught using real patients. They are immobilized in a humanitarian manner and temporary tourniquets are used to identify veins and observe engorgement. Using the models, the students apply disinfection, tourniquets, palpate blood vessels and collect samples, administer drugs or gain venous access, depending on instructions from the teacher, who provides constant feedback on the activity. In the assessment, the actions surrounding the act of venipuncture and the event itself are covered, in other words: handling of patient, disinfection, use of elements to collect these samples, administration of drugs and venous access in accordance with the scenario created, handling of the sample and final disposal of hospital waste.

The students who carried out the practices beforehand with the simulators were more successful in the direct intervention on the animals than those who had received just the master class. The act of direct intervention on the animals was justified by the collection of samples to determine their health profiles (samples for the diagnosis of blood parasites Brucella, leptospirosis, equine encephalitis, etc.).

Animal welfare content addressed in the teaching strategy, practice or activity

- Animal welfare addressed by the five freedoms.
• The relationship between animal welfare, disease and production.
• The role of the veterinarian in the welfare of animals and ethical issues.
• Decision-making in veterinary practice.
• Attitudes of students and veterinarians (including pain management).
• The role of the veterinarian in changing attitudes.

Teaching results obtained
Acquisition of skills and dexterity in the collection of samples, administration of drugs and venous access in different animal species.

Learning about standard techniques for collecting blood samples; use of disinfection, handling of tourniquet, hemostasis and safe handling of patients.

Appropriate handling of devices for venipuncture: vacutainer system, syringes, needles, catheters, venoclysis, use of gloves and final disposal of hospital waste.

Learning based on handling and humanitarian physical restraint of the animals.

Reduce the use of animals in education and learning, substituting initial direct intervention with venipuncture simulators, by first refining skills to reduce the pain caused to animals by reducing the amount of direct intervention (3Rs principle).

The development of simulation models as an educational tool creates a stimulating environment for education and learning that facilitates access to cognitive structures.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

On students: The simulation environment creates a challenge in the form of a game where they play the role of the veterinarian in an exercise in the context of a routine situation, with the administration of a drug, the collection of samples or venous access, deriving knowledge and acquiring skills and dexterity.

On the animals: Direct use was reduced in the education and learning process, minimizing painful and stressful events to which they would be exposed with the educational activities.

On the institution: teaching tools that improve the educational and learning process, which can impact a larger number of students by not having to depend directly on animals.

Conclusions/ observations/ recommendations
Although the notion that animals are harmed in veterinary education is controversial, even in some types of academic practices, like learning venipuncture for the collection of blood samples, venous access and the administration of drugs, it may be correct. However, in schools of veterinary medicine and/or animal science, this paradigm may be partially resolved by using inanimate alternatives such simulators, which are relatively easy and cheap to manufacture, portable and easy to manipulate for the teaching of some procedures like those described.

It was observed that the use of the simulation models for practice in general encountered no resistance from students, who also found the alternatives very pleasant for obvious reasons, including less resistance to repeating procedures to develop dexterity. Since they know that it does not cause any pain or suffering to an animal.
Records and evidence of use of teaching strategy, practice or activity

Development of a simulator for venipuncture using dog and cat cephalic vein
Development of a simulator for venipuncture using dog and cat cephalic vein

Practical sessions in the classroom

References


Use of simulation models in the teaching-learning of clinical skills for small animals

Cintya Boroni González and Alberto Goldsack Merino
Chile

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used:
Clinical Anatomy

Introduction, context and justification for the teaching strategy, practice or activity
Clinical simulation is commonly used in university medical education worldwide. This strategy offers students the opportunity to learn, perfect and refine a clinical technique before using it on real patients, allowing them to improve their confidence while reducing the possibility of harming subjects submitted to the technique.

In clinical practice with small animals, techniques such as placement of peripheral venous access, venipuncture and tracheal intubation are frequently used, but, because they are invasive, must follow good practices to minimize harm to the patient.

In this context the use of the simulation models serves as an important teaching-learning tool for frequently used clinical techniques, since it allows students to master a skill, achieving the skill necessary for professional use, and enabling them to face real patients and perform the technique successfully and safely, minimizing mistakes associated with nervousness and anxiety.

The strategy presented is related to a fifth semester course (out of a total of ten semesters), called clinical anatomy, which marks a transition between basic and professional study. The first part of the discipline entails working with...
Teaching strategies, practices and activities for effective education in animal welfare

Simulation models to acquire clinical skills and techniques, such as urinary catheter, thoracentesis, tracheal entubation, cardiac and pulmonary auscultation. While, in the second part, work is done on real animals, teaching students the correct handling of their future patients, from the initial approach to more invasive techniques.

The incorporation of simulation models provides an extremely important tool in this phase of a veterinarian’s education, since it prioritizes the use of animals for procedures where they are necessary and difficult to replace, and, in doing so, minimizes the number of patients used to master basic techniques.

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

Overall objective:

Obtain technical skill in placement of peripheral venous catheter, venipuncture and tracheal intubation in animal simulation models.

Specific objectives:

- Learn routine clinical techniques for small animals such as the placement of peripheral venous catheter, venipuncture and tracheal intubation.
- Understand the use of simulated models for the education of veterinarians in accordance with the ethical handling of animals for teaching and animal welfare.
- Perform routine clinical techniques using low-fidelity simulators to acquire the desired skill.

Methodology

The teaching methodology employed in the clinical anatomy course, which is taught in the fifth semester of the veterinary medicine program (out of ten total semesters). This course contains 3 hours (135 min.) of theoretical classes and 3 practical activities per week. The activities are divided into 15 practical sessions per semester, of which 8 contain work with simulators, 5 with the handling of real patients (2 practical sessions with small animals, 2 practical sessions with horses and 1 practical session with cattle) and 2 are used for evaluations (1 with techniques using simulators, 1 a clinical exam on horses).

In each practical session, 30 students work in 3 groups. The activities are supported by three teachers who guide the students through the procedures.

To master the routine clinical skills and techniques, low-fidelity animal simulation models are used (RescueCritters®), in this course, 8 forelimbs are used for venous access, 2 heads for tracheal intubation, 2 models for thoracic auscultation, 2 for thoracentesis, 2 for cardiac massage and 2 for the insertion of urinary catheter—this activity uses the first two models mentioned. In addition, materials like peripheral venous catheters, syringes, butterfly needles, medical tape, laryngoscopes, tracheal tubes, etc. are used.

Description of activities: In the first class, basic concepts of animal welfare are presented in order to justify and familiarize the student with the use of veterinary simulators.

The theory provides students with the necessary concepts to perform the clinical techniques, and a document that contains detailed protocols with the steps necessary to perform each of the procedures is also provided.

The practical sessions are conducted in the anatomy laboratory, which has enough room for the students to work. At the start of each practical lesson, each technique is demonstrated. In the laboratory, there are three workstations, where a different technique is practiced for one hour, and then the groups rotate stations until they complete all the activities.

The technique is done based on anatomical knowledge and audiovisual support, which entails videos of the same technique being performed on real patients. In these videos, both successful techniques and common mistakes are shown, so that students do not repeat them.

Evaluation and feedback: Students are graded on the technique, the number of repetitions and the time spent. Feedback is continuous during each practical session and also during the evaluation. In addition, the students are surveyed for their opinion on the practice with the simulation models.

Animal welfare content addressed in the teaching strategy, practice or activity

Module 1: Introduction to animal welfare.

Present basic concepts and definitions of animal welfare.

Module 2: Welfare of animals used in Research, Tests and Education.

This module addresses the justification and familiarization behind the use of alternative simulation models for
Teaching strategies, practices and activities for effective education in animal welfare

Teaching results obtained

In addition, the students are surveyed regarding their perception of the practice with the simulation models.

In 2013, more methodical work was planned for simulation models. During that semester, 70.6% of the 51 students surveyed thought the practical sessions with simulators allowed them to develop their skills in clinical procedures.

In the first half of this year (2014), feedback from students was measured in more detail, therefore, the following data is for the second year the methodology was used.

Out of a total of 56 students, 52 responded to the survey which included specific questions on the methodology, the evaluations and their perceptions on the use of models. Of the students surveyed, 36.5% stated that they had performed some of the techniques covered in the course on real patients, before the training with simulators; 63.5% of the students surveyed had not performed these clinical techniques on real patients.

94.2% of the students surveyed believe that the use of the simulation models is supported by the concept of animal welfare and 96.2% believed that their use reduces animal suffering. 80.8% believe that their training and education in clinical techniques with simulators was adequate. While 19.2% believed that the training was not adequate.

67.3% responded that the time used for the practical sessions and the repetition of the clinical techniques allowed them to develop skills, while 21.2% of the students surveyed held a neutral opinion.

With regard to the motivation that the work with the animals generated, 92.3% indicated that the use of the models was motivating, while 7.7% indicated a neutral opinion. With regard to the attitude of students during the work with the models, 90.4% said that they maintained a serious and professional demeanor. On the other hand, 53.8% indicated that they felt anxious and nervous when performing clinical techniques on the models, while 23.1% held a neutral opinion and the same number felt no anxiety. And while 61.5% believed that the practice with the simulators prepared them to face a real patient, 11.5% held a neutral opinion and 26.9% believed it did not. Finally, 94.2% would recommend the work with animal simulation models to younger students.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

Training with simulators in basic and transition courses in the veterinary medicine program is well accepted by students, who understand that this step is to their advantage, since it helps them master clinical techniques and skills without the anxiety involved in learning on live animals, as was reflected in the student feedback survey for 2014. 53.8% of the students surveyed indicated that they felt anxious and nervous when performing the clinical techniques, which reinforces the fact that this type of simulator is advantageous for the students who use it. They recognize and are motivated by the reduction in the number of animals used in teaching. New generations of students are very much attracted to the field of animal welfare, primarily by animals that are used in teaching, since they recognize that these patients are necessary to obtain a full education, but are very critical when animals are used in the most basic activities of their education.

From a teaching perspective, the acceptance of the use of the models is of paramount importance, both with regard to animal welfare, and for the learning results that can be obtained with their use.

On an institutional level, the Andres Bello University is part of the network of Laureate Universities that work actively to establish internal guidelines for good veterinary practices, focusing primarily on animal welfare, favoring and recommending the use of different types of simulators and simulated cases in the preparation of students in veterinary medicine.

The main criticisms that the students make regarding the work with the simulators is that many of them are not anatomically correct or that the texture is different than the animals, which reduces the number of repetitions of the technique.

Conclusions/ observations/ recommendations

The use of simulators in training the more invasive basic clinical techniques, like venipuncture and the insertion of intravenous catheters, is very well received by students, since they value the repetition and refinement of the techniques before using them on live animals. This use requires a process of adaptation and description of the results expected with their use, so that the purpose of the
activity can be understood. This type of activity reinforces the concept of animal welfare with the 3Rs and the ethical handling of animals in the teaching of undergraduate veterinary medicine.

The faculty at the university, who work actively with simulators, express concern over the fidelity of the simulators, as well as their durability, since the investment in the mannequins is considerable and low durability and fidelity may discourage students from wanting to work more actively with them. Another important point to be considered is when they should be introduced, since the learning outcome has to be well established to maximize the effectiveness of this tool.

It is necessary, from a teaching standpoint, to conduct satisfaction surveys and receive feedback to address the concerns of students with regard to the work with mannequins, and gather sufficient evidence to validate to work with simulators. Learning curves for the different techniques need to be generated to maximize the use of this teaching strategy and facilitate comparison of traditional training versus the training with simulators, and these results should be published in the scientific literature to validate the methodology.

Records and evidence of use of teaching strategy, practice or activity

Practical class with demonstration - Anatomy lab
Practical steps of the teaching methodology employed
Evaluación y feedback – Survey on Simulators

Universidad Andrés Bello
Anatomía Clínica

1º PRUEBA PRÁCTICA ANATOMÍA CLÍNICA

<table>
<thead>
<tr>
<th>Nombre:</th>
<th></th>
<th>Sección:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firma:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### RESULTADOS DE ENCUESTA DE EVALUACIÓN DEL USO DE SIMULADORES


Se sumaron los resultados de TA, A y PA y se consideraron como percepción positiva (POS), asimismo los PD, D y TD para obtener la percepción negativa (NEG) respecto a la pregunta planteadada.

<table>
<thead>
<tr>
<th>PREGUNTAS</th>
<th>TA</th>
<th>A</th>
<th>PA</th>
<th>POS</th>
<th>N</th>
<th>PD</th>
<th>D</th>
<th>TD</th>
<th>NEG</th>
</tr>
</thead>
<tbody>
<tr>
<td>El uso de modelos de simulación animal se apoya en el concepto de bienestar animal.</td>
<td>76,9% (40)</td>
<td>15,4% (8)</td>
<td>1,9% (1)</td>
<td>94,2% (49)</td>
<td>5,8% (3)</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>El uso de simuladores disminuye el sufrimiento animal.</td>
<td>84,6% (44)</td>
<td>11,5% (6)</td>
<td>0%</td>
<td>96,2% (50)</td>
<td>1,9% (1)</td>
<td>1% (1)</td>
<td>0%</td>
<td>0%</td>
<td>1,9% (1)</td>
</tr>
<tr>
<td>La preparación y formación en técnicas clínicas (venopunción, canulación, auscultación, etc.) con simuladores fue adecuada.</td>
<td>34,6% (18)</td>
<td>26,9% (14)</td>
<td>19,2% (10)</td>
<td>80,8% (42)</td>
<td>0%</td>
<td>7,7% (4)</td>
<td>3,9% (2)</td>
<td>7,7% (4)</td>
<td>19,2% (10)</td>
</tr>
<tr>
<td>El tiempo destinado a la práctica de cada técnica clínica en modelos de simulación me permitieron desarrollar habilidades clínicas.</td>
<td>15,4% (8)</td>
<td>28,9% (15)</td>
<td>23,1% (12)</td>
<td>67,3% (35)</td>
<td>21,1% (11)</td>
<td>5,7% (3)</td>
<td>5,7% (3)</td>
<td>0%</td>
<td>11,5% (6)</td>
</tr>
<tr>
<td>Mi actitud durante el trabajo práctico con simuladores fue seria y profesional</td>
<td>42,3% (22)</td>
<td>36,5% (19)</td>
<td>13,5% (7)</td>
<td>90,4% (47)</td>
<td>7,7% (4)</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Las prácticas con modelos de simulación motivaron mi proceso de aprendizaje.</td>
<td>42,3% (22)</td>
<td>36,5% (19)</td>
<td>13,5% (7)</td>
<td>90,4% (47)</td>
<td>7,7% (4)</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Sentí ansiedad o nerviosismo al ejecutar las técnicas clínicas en los modelos.</td>
<td>25% (13)</td>
<td>15,4% (8)</td>
<td>13,5% (7)</td>
<td>53,8% (28)</td>
<td>23,1% (12)</td>
<td>3,9% (2)</td>
<td>13,4% (7)</td>
<td>5,8% (3)</td>
<td>23,1% (12)</td>
</tr>
<tr>
<td>La práctica con simuladores me ha preparado para enfrentar a un paciente real.</td>
<td>9,6% (5)</td>
<td>21,15% (11)</td>
<td>30,8% (16)</td>
<td>94,2% (49)</td>
<td>11,5% (6)</td>
<td>11,5% (7)</td>
<td>3,9% (2)</td>
<td>9,62% (5)</td>
<td>3,9% (2)</td>
</tr>
<tr>
<td>Recomiendaría el trabajo con modelos de simulación animal a estudiantes de cursos inferiores.</td>
<td>61,5% (32)</td>
<td>23,1% (12)</td>
<td>9,6% (5)</td>
<td>61,5% (32)</td>
<td>1,9% (1)</td>
<td>0%</td>
<td>3,9% (2)</td>
<td>0%</td>
<td>26,9% (14)</td>
</tr>
</tbody>
</table>
References


Conservation of Anatomical Specimens and the Creation of an Embryological Collection

Daniel Fernando González Mendoza
Colombia

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used
Animal Anatomy, Embryology and Reproduction

Introduction, context and justification for the teaching strategy, practice or activity
Universities today should embrace innovation, change and up-to-date methodologies to improve the academic education of students. Globalization and use of technology enhances education, the means to convey information and knowledge. In veterinary medicine and other health programs, the “teaching-learning” process requires methodology, procedures and the means capable of absorbing the largest possible quantity of knowledge to transmit it to students (Correa Flavio, 2005), and for many years it was done without taking into account animal welfare, ensuring that animals do not suffer under the pretext of students acquiring knowledge. This work has been conducted by the students and teachers at the Juan De Castellanos University Foundation and is the result of a search for strategies that motivate and facilitate learning for students in areas such as anatomy, embryology and reproduction, where strategies are employed by the teachers: Problem-based learning (PBL) and Project-oriented learning (POL). Using these, they research, develop and apply projects that promote study materials for these disciplines, preventing animals from being affected, because one of the main objectives is to protect the health and welfare of students and animals; obtaining as a result the conservation of anatomical specimens and the creation of an embryology collection. In each of the projects, different anatomical parts were preserved using techniques such as transparentization, diaphanization and plastination, where the raw material comes in the form of cadavers or tissue obtained from animals that have died naturally in accidents or as patients in the clinic.

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity
• Use Problem-Based Learning (PBL) and Project-Oriented Learning (POL) as strategies to improve the learn-
ing process in the disciplines of anatomy, reproduction and embryology of the programs for veterinary medicine and agricultural engineering of the Juan de Castellanos University Foundation.

- Create materials that motivate and facilitate learning of subjects such as anatomy, embryology and reproduction. Search for conservation techniques for anatomical specimens and the creation of an embryology collection that protects the health and welfare of students and animals.
- Stimulate groups in an appropriate research and learning environment, proposing innovative, creative and constructive ideas, collaborating to develop activities that promote knowledge and active participation, in search of a better understanding of the discipline as an integral part of the profession.

The students develop skills such as:

- Learning to identify the anatomy of the reproductive systems of males and females
- Learning to identify the changes and the structures in fetal ages
- Learning to recognize anatomical features of different domesticated species.

**Methodology**

To implement the problem-based approaches, a volunteer activity was organized and proposed for all students who wanted to participate in projects that created study materials for anatomy, reproduction and embryology, where animal and student welfare is promoted, with a view to solving problems of anatomical specimen conservation for the study of veterinary medicine, in an effort to avoid dependence on animals that are sacrificed to carry out dissection work and the use of toxic substances and irritants, like formaldehyde, that hamper handling. As a result, the work began with the students from first to fifth semesters, with greater acceptance from younger students. Workgroups were put together under the guidance of a teacher to develop research proposals and projects to resolve this problem. The experimental projects were carried out in the amphitheater and the morphology labs of FUJDC, located on the outskirts of the city of Soracá, in the Department of Boyacá, in 2013 and the first half of 2014. A space was organized in the amphitheater for each of the groups that, with very limited resources, employed their techniques. All of the techniques were performed using donated animals, specimens and fetuses, which were submitted to a process of washing and disinfection. To obtain bone specimens, bones were exposed and submerged in a bowl of fruit (pineapple and papaya), which had been chopped into cubes of roughly 5 x 5 cm, for a period of one month to one and a half months, after previously removing as much muscle, tendon, blood vessels and other soft tissues as possible with dissection equipment. The fruits contained an enzyme called bromelain (pineapple), which catalyzes hydrolysis of peptide bonds, resulting in a wide range of protein bond breaking. Papain (papaya) has similar properties. For diaphanization and transparentization, the fetuses were dissected and feathers removed from some of the birds and then substances were added, data obtained via detailed monitoring, on a timetable in accordance with the activity of these chemical substances on the anatomical specimen, where transparency was obtained with the procedure, requiring an average of 10 months; we used different solutions and combinations for the transparency process; and shortly before the release of the coloring, the piece is placed in glycerin for conservation. Currently, techniques such as plastination present very rudimentary, but promising, results.

**Animal welfare content addressed in the teaching strategy, practice or activity**

- Animal welfare
- Bioethics
- Ethics and animal welfare
- Research and animal welfare
- Education and animal welfare
- Euthanasia and animal welfare
- Use of animals in research and education.

**Teaching results obtained**

Students were motivated to learn anatomy, embryology and reproduction of domesticated animals, encouraging research and a search for alternatives to using animals for study in these areas.

Various students became interested in participating voluntarily in projects that promote the conservation of anatomical specimens and fetuses, and foster a culture of respect for the environment, animals and their welfare.

A detailed document of protocols was generated for each process, by recording each one of the steps needed to perform the technique.
The techniques employed to preserve the anatomical specimens and fetuses yielded perfect transparency that enables viewing of the bone structure, internal organs and tissues, and the compounds used to preserve the parts do not contain toxic substances or elements that pose a risk to the health of laboratory employees, teachers, students or visitors that handle the collection.

FUJDC now has an anatomy and embryology collection, key for learning in veterinary medicine.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

- Improved class attendance because the “learning by doing” approach promotes greater interest and facilitates the acquisition of knowledge by students.
- Reduction in the number of animals used in dissection and a considerable increase in specimens for learning anatomy, embryology and reproduction.
- Increase in the number of students in animal welfare research groups.
- Academic endeavors, such as small abstracts, articles and participation in research events by students on the themes of conservation of anatomical specimens in the learning of veterinary medicine.

Conclusions/ observations/ recommendations

The aim of education is not to teach young people a particular science, but rather to open their minds, integrate concepts and relate them to the world so that they can be applied to some field and used to search for solutions for problems.

Traditional education has resulted in unmotivated and disinterested students, reflected in poor academic performance, which has created a need for strategic change in learning.

Research in the classroom is a tool that allows the teacher to improve comprehension and the quality of education.

Easy access to the specimens by students, since animals no longer need to be sacrificed and dissected to observe tissues and organs, and the fact that these techniques enable viewing of the organs permanently.

A reduction in the cost of tissue conservation and in the creation of lab waste and decomposing tissues, since with proper care the samples will last for years.

The information found in books and documents is not applicable to the real world, which led us to experiment with our own techniques and compounds and determine appropriate amounts.

There is a need for further study to evaluate the durability of these specimens in the laboratory and for comparative studies between these techniques and conventional bone cleaning, with the aim of evaluating the time necessary to obtain the bone specimens, their characteristics, impact on the environment and an evaluation of the microbial flora that is formed, etc.

The preservation methods can be implemented by the teachers to alleviate the need for dissections, focusing on aspects of animal health and maintenance of transparent cadavers to facilitate the study of domesticated animals.
## Cuadro Procesos Y Control De Investigacion

**Nombre De La Investigacion:** Proceso De Conservación De Piezas Anatómicas Diafanización  
**Cuarto Procedimiento**  
**Fecha Inicio:** 23 Julio 2013 / **Fecha Terminación:** 01 Febrero 2014

<table>
<thead>
<tr>
<th>Fecha</th>
<th>Hora</th>
<th>Proceso</th>
<th>Observaciones</th>
<th>Responsables</th>
</tr>
</thead>
<tbody>
<tr>
<td>23-07-2013</td>
<td>13:00 PM</td>
<td>Consecución</td>
<td>Se consigue una paloma pichona (Torcaza Naguiblanca; Zenaida Auriculata) de color café, que acaba de salir de su nido y aprendiendo a volar se estrella con un vidrio, causa al piso y muere, ya cuenta con su plumaje completo, no conocemos su edad.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13:30 PM</td>
<td>Alistamiento</td>
<td>Se ha pensado realizar un proceso de Diafanización, pero permitiendo realizar una disección, sustituyendo el sistema digestivo, incluyendo el corazón y los pulmones, para experimentar el proceso de transparencia en los órganos.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13:40 PM</td>
<td>Pelado</td>
<td>Se toma la paloma, se inicia a retirar el plumaje de su cuerpo en forma manual, muy suave para evitar laceraciones en su piel. Se termina de retirar el plumaje. Se lava la paloma desde la cabeza a los patas y se lista para fijación.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14:30 PM</td>
<td>Fijación</td>
<td>Se alista recipiente de vidrio con tapa, se agrega alcohol al 70% y se introduce el cuerpo de la paloma en el, se debe cubrir la paloma completamente de la sustancia fijadora. Se tapa y reserva en lugar seguro por 24 horas.</td>
<td></td>
</tr>
<tr>
<td>24-07-2013</td>
<td>13:00 PM</td>
<td>Observación</td>
<td>Se retira la paloma de la sustancia fijadora, se lava con agua a chorros suave y se seca con toalla de papel absorbente.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13:30 PM</td>
<td>Pesaje y medición</td>
<td>Se toma el cuerpo de la paloma ya lavado y seco, se coloca junto a una regla y se estira completamente para medir su cuerpo, en esta ocasión se hizo de largo desde su cabeza hasta las patas. También se realiza el pesaje, se estableció que mide 14 centímetros pesa 300 gramos.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14:00 PM</td>
<td>Disección</td>
<td>Realizando las maniobras de lavado, medición y pesado de la paloma, se alista el equipo de disección, con el ánimo de sacar el sistema digestivo junto con el corazón y los pulmones. Se inicia la maniobras desde la parte Cefalocaudal a la parte craneal (desde la cabeza, a la cloaca), se extrae con mucho cuidado el tracto digestivo, sin embargo se perdió la lengua y parte del esófago.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15:45 PM</td>
<td>Lavado</td>
<td>Una vez se termine la disección de la paloma, se procede a lavar el cuerpo con agua, tratando de retirar sangre y tejido graso. Luego procedemos a lavar el sistema digestivo con todo el cuidado posible para evitar ser dañado. Esta vez no se lava a chorros, si no que se utiliza un recipiente para que la caída de agua sea muy suave y no dañe los tejidos.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16:00 PM</td>
<td>Diafanización</td>
<td>Una terminado el lavado, se procede a alista un recipiente de vidrio grande con tapa, se lista la mezcla Diafanizadora, Agua H2O, Hidróxido de Potasio KOH al 0.2 %. [En un litro de Agua se agrega 2 gramos de KOH] se revuelve hasta obtener una mezcla uniforme. Se colocan las dos muestras anatómicas en el recipiente y se agrega la mezcla, se tapa y se deja en un lugar seguro lejos de la luz directa del sol y de la mano de extranos, se debe hacer observación sobre el material.</td>
<td></td>
</tr>
<tr>
<td>Fecha</td>
<td>Hora</td>
<td>Tipo</td>
<td>Observación</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>--------</td>
<td>-------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>31/07/2013</td>
<td>13:00 PM</td>
<td>Observación</td>
<td>Se puede percibir que la mezcla está turbia, con sangre, con desechos de comida; difícilmente se puede hacer una observación clara sobre el cuerpo de la paloma y el sistema digestivo de la misma, al destapar el recipiente de vidrio, se percibe un olor desgradable, por esta razón se programa recambio de la mezcla diafanizadora.</td>
<td></td>
</tr>
<tr>
<td>07/08/2013</td>
<td>13:00 PM</td>
<td>Recambio</td>
<td>Se sustrae la mezcla diafanizadora del recipiente sobre un colador, tratando que las muestras no se dañen con el movimiento del líquido. Se lavan las piezas y se sustrae el material sólido que se encuentra en el frasco, como es el caso de piedritas, arroz que se encontraba en el tracto digestivo del ave, se extrae de igual forma piel de la paloma. En otro recipiente se mezcla un litro de Agua H₂O, y 2 gramos de Hidróxido de Potasio KOH al 0.2 %. Se centrifugan los compuestos con la mano hasta obtener una mezcla uniforme. Se colocan las dos muestras anatómicas en el recipiente y se agraga la mezcla muy despacio, se tapa y se deja en un lugar seguro lejos de la luz directa del sol y de la mano de extraños, se debe hacer observación sobre el material.</td>
<td></td>
</tr>
<tr>
<td>17/08/2013</td>
<td>13:00 PM</td>
<td>Observación</td>
<td>Sustancia diafanizadora se encuentra transparente amarillento, la paloma está perdiendo piel; se observa trasparencia en alguna parte del cuerpo de la paloma como son las patas, alas. El sistema digestivo muestra un color negruzco.</td>
<td></td>
</tr>
<tr>
<td>24/08/2013</td>
<td>13:00 PM</td>
<td>Observación</td>
<td>El compuesto diafanizador se encuentra turbio amarillento, se observa bastante tejido suelto, al parecer es piel del ave; se puede distinguir transparencia en la mayoría del cuerpo de la muestra, el sistema digestivo está oscuro sin progreso.</td>
<td></td>
</tr>
<tr>
<td>31/08/2013</td>
<td>13:00 PM</td>
<td>Observación</td>
<td>Se encuentra el líquido un poco turbio, de color amarillento, permite hacer observación, se observa piel del paloma suelta, por este motivo se sustrae la muestra para limpiarse. Se alista un recipiente y un colador, se destapa la muestra, se puede percibir un olor fuerte, se desocupa el contenido del recipiente de vidrio sobre el colador. Se lava el frasco y la tapa y se alista para depositar nuevamente la paloma. Mientras tanto se toma el ave, se nota su trasparencia, se distinguen los huesos de las extremidades, alas, cabeza, se observa el castillo, aros de la tráquea, huesos craneales y aros oculares. Se lava a chorros suave para evitar su daño, se limpia la piel suelta, su textura es blanda, gelatinosa como de silicona. Se observa también el aparato digestivo, en él se puede distinguir los pulmones de color blanco amarillento, el corazón esta blanco, la mollera de color negro, esófago trasparente, el intestino de color negro.</td>
<td></td>
</tr>
<tr>
<td>07/09/2013</td>
<td>13:00 PM</td>
<td>Recambio</td>
<td>Se sustrae la mezcla diafanizadora del recipiente sobre un colador, tratando que las muestras no se dañen con el movimiento del líquido. En otro recipiente se mezcla un litro de Agua H₂O, y 2 gramos de Hidróxido de Potasio KOH al 0.2 %. Se centrifugan los compuestos con la mano hasta obtener una mezcla uniforme. Se colocan las dos muestras anatómicas en el recipiente y se agraga la mezcla muy despacio, se tapa y se deja en un lugar seguro lejos de la luz directa del sol y de la mano de extraños, se debe hacer observación sobre el material.</td>
<td></td>
</tr>
<tr>
<td>14/09/2013</td>
<td>13:00 PM</td>
<td>Observación</td>
<td>El líquido de Diafanización está claro, se muestra la pieza (paloma) bien, permite visualizar en forma clara, no presenta sangre, se puede ver los huesos de la cabeza, cavidad torácica, alas, patas, anillos cartilaginosos de la tráquea. El sistema digestivo, se está claarando, el esófago muestra unos pequeños anillos cartilaginosos, el corazón esta blanco al igual que las pulmones.</td>
<td></td>
</tr>
</tbody>
</table>
### 21-09-2013 13:00 PM Observación

Líquido diafanizante está claro, permite visualizar en forma clara, no presenta sangre, se puede ver los huesos de la cabeza, cavidad torácica, alas, patas, anillos cartilaginosos de la tráquea, el sistema digestivo, se está aclarando, el esófago muestra unos pequeños anillos cartilaginosos, el corazón está blanco al igual que los pulmones, la molleja e intestinos están negros, al parecer por la materia fecal.

### 28-09-2013 13:00 PM Recambio

Se hace recambio, a pesar que el líquido diafanizador no está turbio, permite hacer una observación perfecta, se cambia el compuesto para tratar de agilizar el proceso de transparencia, se sustrae el líquido junto a los órganos sobre un colador, se reservan.

### 05-10-2013 13:00 PM Observación

El líquido diafanizante se encuentra completamente limpio, transparente, sin partículas.

### 12-10-2013 13:00 PM Tinción

Se alista el material requerido para el proceso de tinción, por esta razón se tiene un recipiente adecuado de laboratorio para mezclas, una pinza Kelly sin garra, pinza mosquito y gramera. Se alista 800 ml de fenol (C₂H₆O) al 99%, 5 gramos Hidróxido de potasio (KOH) al 0.5% y 1 gramo Violeta Alizarina (C₁₄H₈O₄).

### 19-10-2013 13:00 PM Observación

Se hace observación de la muestra, se puede ver que el líquido diafanizador esta de color violeta, que la paloma se ve transparente, muestra el sistema óseo, el sistema digestivo tiene un color violeta agradable, permite observar con facilidad algunos órganos como el corazón, bucle, partes del intestino. Se dejarán unos días más y se hará recambio de la sustancia conservadora.
26-10-2013 13:00 PM Observación

Se toma la muestra y se puede ver que la paloma está mostrando una mejora en la transparencia: el sistema óseo está más visible y completo, se puede distinguir cada uno de los huesos del cuerpo.

El aparato digestivo está mucho más transparente, se pueden distinguir algunos órganos con mayor claridad, de igual forma el corazón se observa blanquecino.

02-11-2013 13:00 PM Observación

Se hace revisión del recipiente en el cual se encuentra la muestra de la paloma y su sistema digestivo, se observa que el líquido diafanizante ha adquirido un poco de tinción, se hace una nueva revisión del sistema óseo y se observa que se ha mantenido la transparencia.

09-11-2013 13:00 PM Observación

Se hace observación de la muestra, se puede ver que el líquido diafanizante está mucho más lleno de tinción tomando un color rojizo pero sin partículas que enturbien el líquido, se hará un recambio de líquido diafanizante en la próxima visita.

16-11-2013 13:00 PM Observación

El líquido diafanizante se encuentra tintado ya que la paloma está soltando el exceso de pintura.

Las muestras de la paloma están claras y se pueden observar los huesos de la paloma y su sistema digestivo, se observa que el sistema digestivo ha tomado una mayor transparencia.

13-11-2013 13:00 PM Observación

Se hace recambio, a pesar que el líquido diafanizante no está turbio, solamente está un poco tintado debido al proceso que se está llevando.

Se lava el frasco donde se está haciendo el proceso, se lava el cuerpo de la paloma y se introduce nuevamente al frasco, se toma el aparato digestivo para lavarlo y cuando se está haciendo esta maniobra, se observan partículas del proceso de la paloma que se encontraban atrapadas dentro de la molleja y resto del tracto digestivo.

Se lava el frasco y se alista el líquido diafanizante, así:

| 23-11-2013 13:00 PM Recambio |

Se toma el recipiente donde se encuentra la muestra en proceso de diafanización. En otro recipiente se mezcla un litro de Agua H2O, y 2 gramos de Hidróxido de Potasio KOH al 0.2 %.

Se centrifugan los compuestos hasta obtener una mezcla uniforme.

Se agrega la mezcla muy despacio, se tapa y se deja en un lugar seguro lejos de la luz directa del sol y de la mano de extraños, se debe hacer observación sobre el material.

Se coloca todo en el frasco y se alista el líquido diafanizante, así:

| 30-11-2013 13:00 PM Observación |

Se toma el recipiente donde se encuentra la muestra en proceso de diafanización. Se aprecia que la muestra está soltando sustancia de tinción, se observa en forma clara la parte ósea de la paloma que se encuentra abierta para la extracción de su sistema digestivo, este sistema se encuentra en perfecto estado, en él se ve con claridad (tráquea, esófago, buche, hígado, corazón e intestinos).

Se coloca todo en el frasco y se alista el líquido diafanizante, así:

| 07-12-2013 13:00 PM Observación |

El líquido diafanizante está completamente limpio para este proceso, la paloma se observa con claridad, cada uno de los huesos que forman el sistema óseo de la paloma se observan perfectamente. Es claro que podemos pasar al proceso de sujeción, aliviamos los elementos necesarios para el proceso.
Teaching strategies, practices and activities for effective education in animal welfare

Se han reunido los elementos requeridos para el proceso de sujeción.
Entre los que encontramos: Nailon, Recipiente de vidrio completamente redondo en forma de cilindro, tapa de vidrio que es perfecta para la abertura del frasco, lámina de vidrio de 3 mm y glicerina blanca transparente.

Se retira el líquido diafanizador del frasco, se saca la pieza (paloma) del recipiente de vidrio donde reposa, se deja escurrir.

Luego se coloca sobre la lámina de vidrio la paloma y el intestino y se busca la correcta ubicación para sujetarla, con el nailon se amarán las piezas (paloma y aparato digestivo a la lámina de vidrio, se da la forma deseada y se introduce con cuidado todo esto al recipiente de vidrio.

Por último se agrega la glicerina hasta tapar las piezas anatómicas, se tapa y se deja en observación. Para este proceso se requiere 3.000 ml de glicerina.

Se puede observar que la glicerida donde se encuentra la paloma con su sistema digestivo está clara sin partículas, pero presenta burbujas y rayas de aire ya que no se ha homogenizado.

La glicerina está clara, presenta una pequeña maza de líquido de tinción que la paloma ha desprendido, la glicerina tiene burbujas y no se ha terminado de homogenizar.

La glicerina está homogénea, transparente, no hay partículas que contaminen la pieza anatómica (paloma y sistema digestivo, se observa completamente el sistema óseo de la muestra, la glicerina tiene una mancha de tinción leve.

La muestra de la paloma sigue mostrando trasparencia, el sistema óseo está viéndose en todo su esplendor. El líquido de glicerina sigue mostrando destelos de violeta alizarina pero se esperará unas semanas más para realizar un recambio de glicerina y dar por terminado el proceso de trasparentación.

La muestra de la paloma es todo un éxito, la trasparencia ha llegado a su feliz término, el grupo de trabajo está satisfecho con el resultado se programa para hacer recambio de glicerina y concluir el proceso.

Se alista glicerina líquida trasparente, se toma el recipiente de vidrio donde reposa la paloma, se vierte el contenido de glicerina sucia donde está la paloma en un recipiente para ser reservado, se deja escurrir tanto el recipiente como la muestra para sacar lo más posible la antigua glicerina, se vierte nueva mente glicerina nueva y limpia sobre la paloma, se tapa y se limpia el vidrio del recipiente para dar una buena presentación, se reserva para su estudio.

Una vez terminados todos los procesos de trasparentación de la pieza anatómica denominada paloma, podemos concluir que todo el proceso fue un éxito. Que se logró el objetivo principal que era mostrar el sistema óseo completo, la paloma se puede ver en toda su magnitud, mostrando todos y cada uno de los huesos que la conforman.

Esta lista para hacer los estudios que se requieran, esta muestra tendrá una tapa flotante que no le da otro que tomar la paloma para su análisis y visualización.
Experimental projects – Amphitheater and Morphology Lab - FUJDC
Diaphanization (transparency) of fetuses

References


Quality, validity, reproducibility, respect and recognition: an integrated transnational model for learning in animal research ethics

Carmen Alicia Cardozo de Martínez
Colombia/Chile

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used

Universidade Nacional da Colômbia – Background Courses

Introduction, context and justification for the teaching strategy, practice or activity

Animal research ethics has an important place in current scientific development due to the urgent need for higher standards of quality in the results obtained based on the use and care of animals, supported by values of respect and sensitivity to the possibility of pain and suffering that they can be exposed to. The mandatory nature of norms and principles is equally important in ensuring strict compliance, against a backdrop of reflection and recognition of individuality and a moral obligation to all forms of life. Although great strides have been made in the field of health in the last 150 years, there is room for more research in this field in Latin America, where neither regulations nor laws have kept pace with international standards despite the existence of guidelines with technical specifications for production, care and use, which promote the application of the three R’s principle as an expression of research quality carried out with care and respect for animals, as manifested by the Basel Declaration, signed as a pledge that combines technical (use) and ethical aspects (care) in an effort to promote responsible research with future generations. The programs for veterinary education and related sciences do not include education in laboratory science and technology for animals, which requires technical training and constant reflection on human-animal relations. The reinterpretation and search for meaning among the different rationalities and personal and interpersonal sensitivities through a citizen-libertarian dialogue is the ideal analytical perspective to identify the best course of action for complex collective problems such as those described here, a situation that could be solved in theory using hermeneutic bioethics, a strategy that is being developed.
Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

Overall objective of the program. Update, train or prepare professionals to care and use laboratory animals to enable them to understand the world context, with criteria to evaluate, formulate and aid in research projects.

The participants will learn five basic skills:

- They will be capable of assuming an active role in developing and conducting research with animals in accordance with bioethical principles that ensure animal welfare.
- They will have a broad spectrum of elements and tools to apply the 3Rs in their countries of origin.
- They will be trained to guide and participate in committees to evaluate research ethics.
- They will be capable of developing content for programs in research ethics.
- They will be capable of integrating research ethics on Internet networks.

Specific objectives.

- Develop high level of technical skills in the use and care of research animals.
- Employ deliberative methodology and analysis related to animal research.
- Promote skills for the management and development of research with animals, where training and knowledge of animals is the key focus.
- Use knowledge to analyze and evaluate research with animals, for which ethology is fundamental to ensuring animal welfare.
- Understand regulations, norms and parameters for research with animals on a world level.
- Promote discussions and plural, interdisciplinary and international reflection on the use and care of research animals.

The content and methods of the program will enable the participants to:

- Use dialogue methods of mediation and negotiation to solve bioethical dilemmas and in decision-making on committees for the evaluation of research ethics.
- Assume positions of leadership in education and bioethics and in research in their countries.
- Strengthen their capacity to address ethical and social themes in research in the context of international intercultural research.
- Strengthen the capacity to identify and discuss bioethical aspects regarding public policies.

Methodology

The strategy brings together participants from all fields of knowledge and all regions of Latin America in an open and plural space for learning and collective construction. We use a methodology called intervention through research, which is a type of group work, creating an environment of freedom for participation based on experiences, which enables the identification of common ground and potential points for developing interventions for conflicts that arise in relation to animals in the research environment.

The conceptual framework of this methodology uses hermeneutic bioethics, which promotes the application of methodologies to analyze conflicts and all the concepts related to a problem in order to achieve fair actions. On one hand, the methodology of this strategy allows for technical training on aspects that are validated, recognized and required on an international level in relation to the use and care of animals, and on the other hand allows for debate, reflection and deliberation where there is room for all stances regarding research with animals. The idea is to make responsible work with animals more visible, and listen to the points of view of those who want to eliminate all types of animal use, in an effort to arrive at minimally ethical agreements to achieve better coexistence in the social spaces related to research.

Given that research with animals requires the participation of ethologists, biologists, chemists, geneticists, statisticians, mathematicians, etc., participation is promoted from people from all fields of knowledge who are interested in this field and want to participate in a discussion that finally expresses our responsibility to create less violent models of coexistence.

The strategy has three stages: an initial virtual stage lasting three months, conducted by the University of Miami in the CITI program, and an attendance-based stage in Santiago de Chile for 12 weeks and then fieldwork for
six months in the participant’s country of origin, which will focus on applying the three Rs principle in research.

Animal welfare content addressed in the teaching strategy, practice or activity


Guarantee of quality of biotechnical products: definitions and characteristics of the concept of quality applicable to biological and biomedical products. Components of the quality of the products, quality of the development, quality of the conformity, quality of the resources, quality of the process. Models to resolve problems. Techniques to identify problems. Management of quality of biotech products: Guarantee of quality, good laboratory and production practices, control of quality, sanitation and hygiene, validation, self-inspection and audits of quality, employees, facilities and equipment, materials and inputs, and documentation.

Regulatory norms that ensure quality: safe animal house practices if laboratory animals are used, occupational health and safety, international regulatory norms, occupational health and safety service, electrical installations, work with specific risks, fire protection, training, safety rules regarding work with animals, biological risk, categorization of animal research laboratories, drafting of scientific articles that use animals, description of animals and the experimental conditions, welfare and enriched environments, analysis of scientific literature, most common mistakes made in research with animals, required environmental conditions for laboratory animals and their influence on experimental results, biology and ethology of the species most used as laboratory animals.

Teaching results obtained

Implementation of the 3Rs principle calls for a public policy, which would, on one hand, provide a scientific and technological boost that is sought after in this field of research, openly express recognition and respect for animals and ensure their welfare in recognition of their individuality, and, on the other hand, ensure that research justifies their use and care. Reduction requires strong technical knowledge of the science and the technology in laboratory animals and the existence of technical conditions and infrastructure that comply with international standards. Replacement requires an exhaustive search for alternative models, the importance of partnerships with engineers, mathematicians and anyone who can provide new ideas to build models that are, partially or totally, equivalent to animals, and enable the production of equivalent proof. Refinement obliges the researchers to learn more about the biological and social behavior of animals, the neurobiology and the ethology of the animal, to be able to recognize the individuality of the animal and, therefore, promote its welfare in accordance with the urgency to obtain excellent results based on a healthy animal in good condition, and, on the other hand, in response to a clear conscience in relation to the continued use of the animal, making the researcher a better human being, since he has become sensitive to the pain and suffering of the animal.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

The creation of spaces for training and education, and, more importantly, forums for reflection and debate, contribute to the transformation of the daily routine. While conducting these educational activities, we saw that it was possible for people with extreme views (animalistic and non-animalists) to have a respectful and tolerant dialogue about their positions. Most of the participants, at the end of the activities, recognized their lack of knowledge about advances made in research and the social and emotional aspects of animals, and assumptions, beliefs and advances in ethology.

It is urgent that these models be applied broadly in our countries to reduce the uproar and violence surrounding the use of animals in research. The Basel Declaration is an open pledge by the scientific community for the rational use of animals, leading increasingly to their substitution to ensure the welfare and respect of all forms of life.

At the National University of Colombia, where this strategy was first employed 25 years ago, there was no policy
regarding the use and care of animals, and there was no forum for discussing this subject. All this work led to the formulation of the institutional policy for the use and care of animals, developed by the Institutional Research Ethics Committee, led by the vice-director of research in 2011. This development also enabled meetings to be called for ethics committees on the use of animals for academic purposes; participation in a new formulation of the Statute for the Protection of Animals by the Congress of the Republic of Colombia and continued teaching, for the last eight years, of the course on research ethics and the module in research ethics with animals. This course provided fifty places for students from all fields of knowledge, with strong participation from students of animal sciences.

Evaluation of the conditions of twenty eight institutions that use animals in research was carried out to determine and understand the major limitations in order to try to overcome them. An interdisciplinary group of professors representing all fields associated with the use of animals was created to propose policies and foster compliance with CICUALES inside the institution.

Conclusions/ observations/ recommendations

This strategy was first applied in Colombia and now in Chile, where Latin American researchers are accommodated in a model that led to the development of the Interdisciplinary Center for Studies in Bioethics, for ten years, with support from Fogarty, in humans and now with animals.

The transformation of the researchers is palpable in relation to the use and care of animals, when they are armed with the basic minimum knowledge to understand that this exercise provides important training in aspects never before considered in educational programs. The effort to understand totally unknown living beings, from their social, emotional and biological behavior, fosters new attitudes and values in the researcher which makes him more tolerant, respectful and considerate of his work companions and even more so toward the animals. It is possible to apply the 3Rs principle in research groups alongside principles of CIOMS or the Basel Declaration, while ensuring the existence of space for training, construction, and different, open and plural thinking around the needs of research. It is possible to conduct and generate low-cost work models, with quality, excellence and reproducibility and respect animals if we create the conditions for interdisciplinary support.

The generation of networks in relation to the use and care of animals in research is urgent in our countries. Support like www.bioterios.com is a clear example that change is possible in a field as developed as the science of research animals.

Our experience in Colombia has shown that, after twenty years of training researchers and students interested in the theme one by one it is possible to rethink the inclusion of animals in research. We have created a quality work model, but one with compassion, in other words, technically very strong and based on the values of respect and consideration for animals. In the beginning, oftentimes, researchers requested animals for their projects, and since our premise was to train them first, by the end of the process, they decided on another plan or another model or strategy before using the animals.
Records and evidence of use of teaching strategy, practice or activity

Laboratory Animal Science - IBUN Colombia
References


Ethics in the Use of Animals and Animal Welfare

Marta Luciane Fischer
Brazil

Introduction, context and justification for the teaching strategy, practice or activity

The ethics of animal use and animal welfare is an important theme for discussion by different professional fields and different levels of education. Given the new ethical fundamentals that guide decision-making when faced with an ethical dilemma, associated with the realities of a globalized world, economic interests and recognition of individual perspectives, a new intervention is required. Bioethics emerges in this scenario as a discipline that bridges the gap between biological and human sciences, with a view to dialogue between all subjects/actors involved in the pursuit of new ethical paradigms that establish a more just relationship among all living creatures. Among the parameters used to attribute moral status to animals is sentience and the ability to experience pleasure and suffering, whereby it is considered immoral to promote the suffering of any sentient being. Considering that our society bases its conduct on utilitarian and anthropocentric parameters, and that in the short and medium term abandoning the use of animals to satisfy the needs of humans is not realistic, the science of animal welfare must be developed on different levels, in order to promote the best possible conditions for these animals who have to be kept in captivity under our care. In this manner, we propose to present students from different programs and at different levels of education an outline of animal ethics and the science of animal welfare, in order to create a network of professionals, citizens and human beings who understand that it is possible to provide a good existence for all. In parallel with the development of reflections, discussions, production of information and awareness, we propose that diagnostic methods for conditions of welfare be encouraged and supported to minimize the artificial and stressful conditions of captivity.

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

• Work with ethics of animal use and animal welfare at the masters, specialization, undergraduate and
secondary [extension] level, as elective and mandatory disciplines—with a view to preparing students and professionals from different fields to act in the area of animal ethics and welfare.

- Make students aware of emerging and traditional ethical issues in the use of animals by our society
- Prepare students to diagnose conditions of animal welfare
- Encourage students to reflect on the arguments of all actors/subjects involved in the issue using bioethical principles as a guide in this dialogue and direct the evaluation of the animal using biological and ecological, societal and legal input.
- Guide students in building their own concept on the issue, culminating in the awareness of their role as professionals, citizens and human beings in the resolution of these conflicts
- Encourage the positioning of students on issues by preparing them to draft and publish scientific articles in different languages.

Methodology

The proposal addresses ethics in the use of animals and animal welfare for students in masters, specialization, undergraduate and secondary [extension] programs, as elective and mandatory subjects. In the mandatory coursework for programs in biology and psychology, the theme is addressed in the course Ethology, where students learn to create ethograms and quantify behavior. The teaching proposal for this course includes initially a historical and conceptual positioning of the theoretical framework.

The students are encouraged to develop an in-depth study on specific topics in ethics in the many uses of animals by our society. The study should be presented in the form of an essay which is published on the Blog http://etologia-no-dia-a-dia.blogspot.com.br/ and finalized with a virtual (university’s internal system) and classroom discussion. In the essay, the student will use a blog approach that includes hyperlinks and videos, present ethical themes in the use of animals and animal welfare and a real case study from news reports, addressing biological and ecological issues of the animal, and social and legal issues regarding the ethical problem identified. Students then present their position. The results have been fantastic, with people from around the world using the material from the blog and social networks where the material is published.

Teaching results obtained

The electives and mandatory courses on the ethics of the use of animals and animal welfare for students in masters, specialization, undergraduate and secondary [extension] programs have produced fantastic results. In the theoretical work requested from all educational levels, the students present a report on a real case of animal use analyzed from a technical standpoint [considering animal welfare in terms of biology, ecology and behavior, ethics [reflection on procedures that treat animals as living beings and thus worthy of respect. Taking into consideration the emotional and sentient systems of physical and psychological pain]], political [laws that regulate the use of these animals in the situations evaluated] and inference [suggestions for procedures to temper the effects on animal welfare].
The essays are published on the Blog http://etologia-no-dia-a-dia.blogspot.com.br/ and on social networks, where partial results have already been presented in congresses in the field of education (http://educere.bruc.com.br/ANAIS2013/pdf/8982_4770.pdf and http://educere.bruc.com.br/ANAIS2013/pdf/10278_5315.pdf). The ethogram is presented in the form of a scientific article and as a presentation. The data are characterized in flowgrams and graphics and the students are asked to evaluate the conditions of welfare provided for these animals, and reflect on what would be possible to do to mitigate these conditions. We highlight that numerous final papers and masters dissertations are written on this work. Important teaching results include the development of paper writing skills in different languages, investigative research, reflection on subjects/actors involved and arguments backing a critical position.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

The courses on the ethics of the use of animals and animal welfare for students in masters, specialization, undergraduate and secondary (extension) programs, as electives and mandatory subjects, have produced a significant impact on local and global society. After receiving a theoretical framework, students are ready to research a specific theme and build a solid bioethical argument, in addition to preparing themselves to explore different languages that can be used to reach different publics. Their work and positions are not limited to the classroom, but touch the world, raising the awareness of others, positioning themselves on both social networks and the blog, and drawing interest from the media which seek out the authors in order to write reports on the theme. The discussions that take place in the internal virtual system and in the classroom constantly produce ideas and changes in the perspective of the students who report satisfaction with the new reality proposed, which will make a difference in how they act as citizens, professionals, and mainly, as people.

Conclusions/ observations/recommendations

The ethical use of animals and animal welfare are extremely challenging practices for any professional to implement, especially in Brazil. In addition to being a new discipline, economic interests and deep rooted cultural beliefs impose many barriers that make professionals and citizens vulnerable to accepting certain conduct as normal, even if they do not agree. Anthropocentrism distances man from animals, leading people to doubt their sentient and cognitive capacities, which underpins many practices. So it is a huge challenge to educate professionals who have always fallen in line with these views. Today, we need a multidisciplinary approach, from bioethicists in search of new paradigms to guide social conduct and veterinarians, animal scientists and biologists to develop technologies to diagnose the conditions of animal welfare and propose new ways of making captivity for the animals under our care less harsh. We encourage professionals from all fields to include these themes in their courses.
Records and evidence of use of teaching strategy, practice or activity

Flowgram of the themes and methodology in the ethical use of animals and animal welfare at different levels of professional education

Essays published on the Blog http://etologia-no-dia-a-dia.blogspot.com.br/ and interface for the group for dissemination on social networks
References


Chapter 4

Strategies and teaching practices with community outreach for effective teaching of animal welfare
Everyone in support of the welfare of domesticated animals

Sandra Adelly Alves Rocha
Brazil

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used

Workshop for teaching practices, methodology in biology and ecology, etc.

Introduction, context and justification for the teaching strategy, practice or activity

The Goiano Federal Institute (Ceres Campus) has teaching programs in biology and chemistry as well as programs in agronomy, animal science, secondary and technical education, information technology and agriculture and livestock farming, in addition to Ministry of Education programs like Mulheres Mil, PRONATEC, distance education, etc. In most of the programs themes related to the welfare of domesticated animals could be inserted. The teaching strategies and practices for effective education in animal welfare presented here are part of the project “Society and animal welfare,” registered in September 2013, as an extension project of the Goiano Federal Institute, although the activities and reflections presented here are from before the registration, since they began in the second half of 2010. The project’s main proposal is to insert the theme of responsible care for domesticated animals into formal and informal education and implement public policies for animal welfare, including the organization of events, registration and monitoring of the current population of domesticated animals, as well as providing technical support and temporary homes and shelters, in addition to working with voluntary, free and/or low-cost sterilization programs for domesticated animals. These initiatives are aimed at reducing the problem of abandonment, abuse, lack of basic knowledge on the needs and care required for domesticated animals as well as promoting the control of zoonoses and accidents caused by stray animals.

Partnerships were signed between the Goiano Federal Institute, their employees, students, educational entities, companies and cities, in addition to the community in general. This cooperation between different sectors of society is a viable solution for cities.

We should stress that the cities of Ceres and Rialma (Goiás, Brazil) do not currently have projects that promote animal welfare. Nevertheless, many residents of the cities are concerned with this issue and work voluntarily, in
Teaching strategies, practices and activities for effective education in animal welfare

an unorganized manner, to care for these animals, whether they have homes or not. In this manner, it is urgent to continue the implementation of initiatives like “Everyone in support of animal welfare.”

These benefits are priceless and justify the implementation and maintenance of the project “Society and Animal Welfare.”

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

Overall objective:

Introduce the strategy “Everyone in support of animal welfare” in the city of Ceres.

Specific objectives:

• Train environmental education agents to intervene in situations in which animals are suffering and change these situations, using the principles of animal welfare.
• Conceive and carry out environmental education aimed at responsible ownership, with the introduction of educational programs using different types of media and actions, in order to involve all of society, including government, so it can play its part in the care of animals.
• Follow the creation of temporary homes, from planning to the maintenance of the location, considering the context related to those responsible for the homes.
• Monitor and provide technical support for informal temporary homes and shelters.
• Contribute to the organization of free voluntary sterilization for part of the dog and cat population of the cities of Ceres and Rialma.
• Organize and promote community sterilization efforts with veterinary schools, and follow-up on healing processes.
• Provide basic care for sick dogs and/or cats for the low-income population, stray and/or community animals, in cases of extreme urgency.
• Help to create and promote public policies and initiatives to protect animals;
• Perform censuses and monitoring of the dog and cat population in the cities of Ceres and Rialma.
• Monitor individuals of the dog and cat population without homes.
• Create and maintain a site to register and follow-up on animals and announce project activities.

Methodology

In September 2013, the animal welfare project was formalized, and registered as an extension project at the Goiano Federal Institute. For the project, people involved were divided into 4 groups, called task forces (TFs). Each task force was composed of an administrator and students from the institution. The table below contains information regarding the characteristics of the task forces.

Animal welfare content addressed in the teaching strategy, practice or activity

Physical health of animal, main diseases, how to avoid them and treat them (vaccination, deworming and basic treatment). Basic hygiene and maintenance for animal welfare. Capture techniques. Psychological health of animal and behavior of dogs and cats. Basic notions of training.
Temporary homes and shelters, environment, administration, legislation...

Teaching results obtained

Communication TF: Website.

- Ecological fun run (to promote animal welfare and responsible care campaign)
- Database with different bibliographies and legislation

Education TF: banners

- Environmental week “piggybacking” on different projects: 300 children from the city of Ceres watched a puppet show on animals, which emphasized the responsible care of dogs and cats.
- Scientific articles, eight lecturers at the Goiano Federal Institute, two coloring book primers.
- Folders, puppet show and vignette on animal welfare
- Project approved by the city council of Ceres and Rialma
- Content used in different disciplines, including 2,000 distance education students.

Census and monitoring TF:

- Training of 80 community agents, 4,000 homes visited and animals registered, census of stray animals being tested.

Animal capture TF:

- Registration of temporary homes and homes
- Animals sterilized by the city in partnership with local veterinary clinic and by the animal welfare group.
- Monitoring of animals belonging to low-income public and strays.

- Sketch of new temporary homes.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

Impact on the community:

4,000 families visited, 300 children watched the puppet show, community awareness, including the city of Ceres. Data analysis, five homes assisted.

Impact on students:

- Student exposure to different materials on animal welfare.
- Training of “animal welfare inspectors within the Goiano Federal Institute.”

- Ability to work in a transdisciplinary manner. Around 200 students produced or attended lectures on environmental education. Awareness of number of animals abandoned. Data analysis

Impact on animals:

- Monitoring of welfare of 200 registered animals. Data analysis. Forty animals registered by the city, 40 animals registered by the group, over 100 vaccinations provided.

Conclusions/ observations/recommendations

This strategy was shown to be effective and the process is being adjusted. The census helped us to get a realistic idea of the number of animals in the city and outline more realistic goals. The communication and education task forces raised our profile in the community, enabling us to better understand and help the community to care for domesticated animals, where technical support is of prime importance for the community and local governments. Sterilization was a popular initiative with the community, generating a waiting list. The effectiveness of the joint efforts of the different groups of society, directed by the institution and the student members of the project, was evident.
Records and evidence of use of teaching strategy, practice or activity

Announcement of selection process for extension scholarships for students

Students and animals at the Ceres City Dump

Image of Primer “Big Dog” and Puppet Show on animals

References


GOIAS. Lei nº 17.767, de 10 de setembro de 2012. Dispõe sobre o controle da reprodução de cães e gatos e dá outras providências.


Learning about Animal Welfare outside the classroom

Rosemary Bastos
Brazil

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used
Animal welfare

Introduction, context and justification for the teaching strategy, practice or activity
The subject of animal welfare was introduced at the institution in 2007, after a visit from the WSPA aimed at encouraging the introduction of the teaching of animal welfare in the curriculum of the veterinary medicine program and after a course for teachers in animal welfare. The institution approved the introduction of the course, and currently students from other programs (agronomy, animal sciences) are also interested in enrolling. The course paved the way for lectures/courses on the theme at the institution, roundtable discussions, interviews for newspapers, courses and new lines of research related to the theme. The use of the material offered by WSPA was of fundamental importance to begin an exchange of knowledge, awaken an interest in learning by the students and introduce new teaching practices. In this manner, after years of experience with the course it became clear that just conveying the theoretical content of the discipline was not enough. The students needed to apply this knowledge outside the classroom, inside or outside of the institution. To complement the methodology used an idea emerged to employ a problem-based learning approach, which uses student-centered teaching. This type of methodology, an educational method that first emerged at the University of Maastricht, has been well accepted in the academic world. Inside this context, the students establish work groups to identify the problems surrounding animal welfare. They research, discuss and voice their opinions and interpret the results obtained in order to produce possible solutions or recommendations. According to the theory of knowledge, problem solving is highlighted as the central element of the methodology for classroom work and in this approach, questions should provoke and direct, in a significant and partici-
patory manner, the process of building knowledge by the student, and also serve as a mobilizing element for this construction (Vasconcellos, 1999, p. 147). The discussions generated are part of the teaching of animal welfare in different undergraduate courses, and, therefore, the students learn to learn and prepare themselves to solve problems related to their profession in which the science of animal welfare is involved.

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

The objective of the practice introduced is to demystify the concept of animal welfare in the sense that it can be applied by the students, in other words, that the discipline is not just theoretical, but is present in the day-to-day routine of the students inside the institution where questions can be raised regarding the different practices used with animals, or outside the institution where various types of animals can be observed: production, work, pets, experimentation and wild. Objectives also include discussions of ethical issues and making students aware of legislation on protection. The students learn how to apply the five freedoms to the problems encountered, develop critical thinking and build a set of viable solutions, through teamwork. In addition, when presenting these data their awareness of the problems observed is evident. Together with this practice the students are taught to prepare lectures for different target audiences: horse-drawn cart drivers, handlers, farmers, primary school students, student scientific initiation at the same institution, presenting the concept of animal welfare in easy-to-understand language.

Methodology

The course is divided into three stages:

Stage 1: the theoretical portion presents the concepts (introduction and evaluation); physiological, immunological and behavioral indicators; ethics; legislation; evaluations and issues of animal welfare for production, work, pets, use in entertainment, experiments and wild animals.

Stage 2: students conduct practical work, with the objective of learning more about the theme, observing the problems, formulating questions, finding answers to solve problems through practical observations and based on scientific literature. After the practical work, the students submit written work and present the results after preparation of the material. This step is important to foster discussion/debate of the problems found, creation and acceptance of knowledge, leading to an exchange of knowledge and search for solutions.

For this practice the students are divided into five groups:

• Group 1: Welfare of production animals: visit and evaluate a private farm and choose a species (pigs, cattle, buffalo or sheep);
• Group 2: Welfare of work animals: Evaluate 6 to 8 horses in the streets of the city;
• Group 3: Welfare of pets: evaluate 6 to 8 cats and/or dogs in their respective homes, protection agency or city pound;
• Group 4: Welfare of wild animals: choose one or more species sold in pet shops;
• Group 5: Welfare of experimental animals: visit and evaluate animals at an agriculture college or support unit (places where animal experimentation is conducted at the institution);

In accordance with the five freedoms each group scores each freedom from 0 to 10. After this evaluation, the groups describe the main problems of welfare and put together a practical program to improve welfare taking into consideration the five freedoms. Ethical and legal issues are also discussed within the context.

As described previously the results found are presented in written form and presented to the entire class, with the aim of fostering a discussion/debate and finding possible solutions to the problems encountered.

Stage 3: The aim is to train students to be able to pass on this knowledge to others. The groups prepared lectures focused on the five freedoms, each group taking into consideration the target public. The class was divided into 5 groups:

• Group 1: Welfare of production animals: lecture for owners and handlers;
• Group 2: Welfare of work animals: for horse-drawn cart drivers;
• Group 3: Welfare of pets: lecture for elementary school students;
• Group 4: Welfare of wild animals: lecture for elementary school students;
• Group 5: Welfare of experimental animals: lecture for scholarship recipients initiating scientific research at the institution.
Teaching strategies, practices and activities for effective education in animal welfare

The lectures are presented using a digital projector for the class to foster discussion/debate.

**Animal welfare content addressed in the teaching strategy, practice or activity**

Evaluation of welfare and use of the five freedoms. Physiological indicators of good/poor animal welfare: the relation between welfare and physiology; Behavioral indicators of good/poor animal welfare: Identify how behavioral indicators contribute to understanding animal welfare; learn how to identify possible causes of abnormal behavior; Immunological and production indicators of good/poor animal welfare: Understand the relationship between welfare and disease and the relationship between welfare and production performance; Ethics: moral status of animals; sentence. Legislation on protection: Brazilian laws.

Assessment and issues of welfare concerning production animals: causes of poor welfare; assessment of welfare on farms based on the five freedoms; problems related to mutilations; shipping and slaughter.

Assessment and issues of welfare for work animals: assess welfare based on the five freedoms; identify the problems that affect welfare; suggest improvements and alternatives for the short and long-term; understand the benefits of improving the welfare of work animals for the owner.

Assessment and issues of welfare concerning pets: assessment of welfare based on the five freedoms; responsible care; strategies for population control.

Assessment and issues of welfare concerning wild animals: assess welfare based on the five freedoms; problems related to conservation; identify issues of welfare that affect wild animals in the wild; wild animals in captivity; identify potential solutions for these welfare issues.

Assessment and issues of welfare for animals used in experiments: assess welfare based on the five freedoms; main questions regarding the welfare of animals in laboratories; procedures and methods of euthanasia; the use of the “3 Rs” (Replacement, Reduction and Refinement); types of legislation regarding the use of animals in science.

**Teaching results obtained**

Active participation by the students who learn about teaching of animal welfare was more productive when compared to previous years, when most of the classes were preoccupied with transferring information from the teacher to the student, showing that the process of learning should be focused on the student, since from observations made in the classroom students were encouraged to observe the problems, research, reflect, understand and create solutions within the context of their professions in relation to the theme addressed.

The discussion of the problems found in groups in relation to animal welfare promoted a link between the ideas and concepts and also favored cooperation between the students, enriching the lessons with their discussions. Using the knowledge acquired previously by the students, they formulate questions on what they need to know and actively building knowledge, demonstrating that through communication and reflection it is possible for newly acquired information about the theme to be retained in the long term.

Within this context, the practice used served as an incentive to motivate the student to learn and integrate the discipline of welfare with other disciplines. In addition, through the discussion/debate it was possible to highlight other important aspects of student preparation, such as communication, teamwork, attitude, ethical and professional values in relation to the theme studied, enabling an interlace with other disciplines. We also observed that the teacher became a facilitator of learning in relation to the teaching of animal welfare, once the student was directed to employ the self-directed learning approach.

**Impact of the teaching strategy, practice or activity on students, animals, community, etc.**

Students: introduction of animal welfare concepts; learn how to assess welfare using the five freedoms in the various types of animal studied; awareness of the main problems related to the welfare for various types of animals, studied inside or outside of the institution; awareness and interpretation of Brazilian legislation; training to conduct lectures/courses on the theme for different target audiences; interest awakened in the science of animal welfare for final papers.

Community: awareness of the main problems of animal welfare through presentation of lectures/courses on animal welfare during the Week of the Rural Producer and in public and private schools for the local population involving the students; greater interest from the media on the subject through interviews, articles and local magazines and/or discussions.
Institution: greater concern with the problems observed by the students, primarily with animal experimentation, interest in the theme from students and/or teachers responsible for the Academic Week in order to introduce lectures/courses on animal welfare, and interviews on the institution’s site on the topic.

Animals: direct awareness of the students, the community and the institution on the topic suggest that there may be a concern with the animals not only on matters related to welfare, but also the rights of these animals. It is expected that greater awareness by the public combined with public policies will lead to viable solutions for the problems encountered.

Impact indicators:

- Larger number of students interested in the animal welfare discipline;
- Larger number of lectures/courses given to the general public.
- Greater interest on the topic from the media;
- Greater interest from other teachers on the topic.
- Greater interest in the writing of final papers on the science of animal welfare.

With the presentation of previous impact indicators it is suggested that a greater number of animals be included.

Conclusions/ observations/ recommendations

The students presented greater motivation to learn, demonstrating interest in employing their critical thinking and creativity, while also developing skills and competencies for working in groups, for analyzing results and, most importantly, creating new solutions for the problems observed. The students presented increased awareness of the themes addressed, showing a keen interest in questioning actions taken not only outside the institution but also inside with regard to certain practices still in use. In addition, a clear understanding of the importance of the discipline animal welfare and its relation to other disciplines was observed through the discussion/debate of the groups. Within this context it is possible to conclude that the use of this methodology is viable not only for other disciplines, but can also be used in other segments of the institution to promote greater interaction of students with the academic community, leading to more discussion/debate on problems and possible solutions.

Records and evidence of use of teaching strategy, practice or activity

Students of the course BEA 2013 7

Assessment of animal welfare: Cats and Dogs – Institution 1 – Macaws and parrots
Assessment of animal welfare: pigs and birds

References


Animal welfare is the state of an animal as regards its attempt to cope with its environment (Broom & Fraser, 2010). Stress is a biobehavioral response of the body when faced with a challenge (stressor) capable of perturbing homeostasis to the point of damaging the regulation of the response, and is inherent to all living creatures (SGAI, 2010).

Various authors have conducted research showing that animals can motivate children with emotional, learning and linguistic problems. Animals help children to develop feelings of compassion and empathy, in addition to the ability to interpret aspects of nonverbal language. They also help to develop humanitarian attitudes in relation to animals and contact with them encourages ecological awareness. For the academic, this type of extension activity encourages positive feelings toward social responsibility and reinforces the application of animal welfare knowledge in practice.

The objective of the work was to motivate children to study and read on subjects related to the environment and responsible ownership of animals. In addition to providing undergraduate students an opportunity to apply their knowledge acquired in the classroom in a fun,
effective and creative alternative learning approach, and also to determine strategies to ensure that the animals that participate in the sessions of Animal-Assisted Education (AAE) and Animal-Assisted Therapy (AAT) were free of stress, anguish and fear in the event that such an act could lead to stress, as measured by changes in physiology and behavior.

Methodology

Children aged 3 to 14 years with speech delay (oral), who showed interest and motivation through contact with animals, with problems of self-esteem and difficulty in learning were preselected by teachers of public schools participating in the project and met weekly for six months for educational and therapy sessions assisted by animals.

In the sessions a guinea pig (Cavia porcellus), a cat (Felis catus) and a dog (Canis lupus familiaris) were used. All of the animals are part of the Mascotes da Alegria (Mascots of Joy - CESCAGE) extension project, which uses animals as facilitators to help children and special patients, in three different institutions in the Paraná city of Ponta Grossa.

All of the animals selected were evaluated based on health criteria established by the veterinarian in charge. The welfare of the animals was also prioritized, as well as striving to respect the five freedoms established by the Animal Welfare Council. All the animals were the property of the participants and/or volunteers of the project and were accustomed and trained for the routine.

The sessions were conducted by healthcare and educational therapists or in the form of lectures by professors of veterinary medicine, for no more than an hour, and water, beds and specific toys for animals were made available. The materials used in the therapeutic sessions were: comb, bed and water bottle for animals; food, feed and snacks.

Animal behavior was observed by the veterinary team responsible for ensuring the welfare of these animals in all therapy and educational sessions assisted by animals. It was established that whenever behavioral signs of anxiety or fear were observed, the sessions would be immediately interrupted.

Initially the dogs were classified according to Houpt [2005] into:

- Calm: whose ears and tail remain low;
- Alert: whose ears and tail remain pointed upward and/or with one of the paws pointed forward;
- Aggressive: dorsal fur standing up, showing teeth, ears pointing forward and tail slowly wagging;
- Fearful: the animal remains on the ground, with tail between its legs and ears down.

In addition to the classification for dogs, a table of signs was developed by the group and if an animal presented one, it would be exempted from the work:

- Small rodents: tries to bite student, vocalization, heavy breathing, rejection of snacks and listlessness.
- Dogs: constantly licks snout, destructive behavior, elimination disorders, constantly sniffing the ground, efforts to run away, increased in heart and respiratory rate and excessive vocalization.
- Cats: tries to isolate itself by finding a hiding place, excessive vocalization and reduced food intake.

Contenidos del bienestar animal

Animal welfare content addressed in the teaching strategy, practice or activity

Various types of content were explored during the projects, such as:

- Behavioral fundamentals: the basis for the behavior of the animals used was studied to identify possible signs of stress and behavioral disturbances.
- Fear, anxiety and suffering: knowledge of “out of place behaviors” or stereotypical behaviors in which these situations became evident.
- Stress mechanisms: studies on all neuro-endocrinological mechanisms that involve stress.
- Transportation of small and medium-sized animals – cats and dogs: because these animals were transported to the schools for the sessions, an understanding of the mechanisms to minimize stress provoked by the shipping was necessary.
- Assessment of animal welfare: learn to assess animal welfare on a scale.
- Five freedoms that determine animal welfare: study and apply in practice.
- *Sentience: The ability to feel is an important discussion today in our society and one that is working to change habits to minimize animal suffering.
• Pain: discussion on the relevance of pain in animals.
• Discomfort: signs and harm caused.
• Indicators of animal welfare:
  • Behavioral indicators of stress (signs of stress seen through reactions in posture and gait)
  • Physiological indicators of stress (rectal temperature, heart and respiratory rate).
• Indicators of pleasure: behavioral and physiological signs of satisfaction and well-being of each species.

In addition to the project, which has been conducted for four years in schools, there is a study group that meets weekly for a critical discussion in the classroom. The student must understand the mechanisms involved in animal suffering and the practices to try to minimize it.

Teaching results obtained
In all the sessions the children grew closer to the animal and expressed some emotion. In the 25 sessions held, the animal stimulation resulted in motivation most of the time (96%, 24/25). AAT and AAE resulted in spontaneous speech by the participants on all occasions. The behavioral assessment presented two negative results: one dog presented behavior considered aggressive and another fearful (2/20). During the study, no stereotypical behavior was observed. The academics of the program had the opportunity to evaluate, using the assessment records, by “entering” into the world of feelings of their future patients and learning in practice the concepts of animal welfare.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.
Contact with the animals appears to improve the quality of life of the children and their mere presence is capable of creating an interactive environment while minimizing difficulties. In addition to developing an ecological awareness through the lectures by the students. For the academics, it is also a way of encouraging respect for differences, difficulties and awakening a feeling of solidarity and understanding of animal welfare.

Conclusions/ observations/ recommendations
Animals are beings like us with feelings and emotions that need to be respected. The veterinarian is a specialist in Animal-Assisted Therapy who can identify signs of stress, fear and anguish that harm animal welfare.

The presence of animals in the assisted therapy and education sessions appears to be a strong predictor of motivation for the manifestation of emotions in this group of children.

The academics showed a spirit of solidarity in addition to developing public speaking skills and knowledge about animal welfare.
Records and evidence of use of teaching strategy, practice or activity

Lectures

Sessions were conducted by healthcare and educational therapists
Sessions - Animal-Assisted Education (AAE) and Animal-Assisted Therapy (AAT)

References


Humanitarian Education in Animal Welfare

Marcia Marinho
Brazil

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used:
Behavior and Animal Welfare

Introduction, context and justification for the teaching strategy, practice or activity

The course on animal welfare was introduced as a result of external requirement and pressure from society given the scientific determination of animal sentience. The capacity to feel pain and consciousness are no longer a state attributed exclusively to human beings. This course is based on the science of welfare, on ethical principles that consider the actions of man with animals and the legislation that determines the form in which we are obliged to treat them.

Because of this, and tremendous pressure from society, the animal welfare course was included in the curriculum of undergraduate programs under agricultural sciences. In our unit, the course Animal Behavior and Welfare was created, in 2000, with the aim of standardizing the course in the three units of the Paulista State University, and then offered as an optional course for junior and senior students of the undergraduate program in veterinary medicine. To enhance learning, the principles of humanitarian education were used in the teaching practices and strategies, which were associated and introduced into the course content to promote effective learning. Interdisciplinary was adopted, by establishing a multidisciplinary link, and allowing the animal welfare discipline to interact with other disciplines that make up the curriculum. There is also a proposal to make the course mandatory.

From this perspective, the discipline has been integrated with the aim of enriching the teaching policy of the veterinary medicine program, by combining the principles of humanitarian education and animal welfare. Thus building knowledge founded on the premises of teaching and learning, collaborating to make paradigm shifts in professional practice and citizenship.
Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

The objective of the course is to prepare generalist professionals, able to understand and translate the needs of individuals, social groups and communities with regard to the activities inherent to veterinary medicine. Considering the importance of this professional in the socioeconomic and political context of the country, as a citizen committed to the interests and continuous challenges that society produces, professional must realize their responsibility toward regional vocations and the preservation of ecosystems, the development of agriculture and livestock farming, the production of food, animal and public health, without compromising the future of mankind and humanity. It is against this backdrop that we seek to encourage and foster critical and reflexive thinking, collaborating in this way to build knowledge as a transforming factor. The objective of the current project was to: prepare and train generalist veterinarians, founded on the principles of humanitarian education and animal welfare; promote and foster critical and reflexive thinking, classroom discussion, stimulating the search for practical solutions, founded on humanitarian handling; promote quality of life of the public, communities, as well as the production, health and welfare of animals; promote ecological equilibrium and sustainable development in harmony with livestock farming and the environment; promote veterinary medicine as an ethical science founded on the rights of animals; promote respect and protection of animals in all spheres of the process; whether in education, research or extension; foster citizenship and ethics in veterinary medicine with the aim of promoting a just society founded on the principles of humanitarian education and animal welfare. (Text adapted from the Educational Policy Project of the Veterinary Medicine Program, 2013).

Methodology

Theoretical and methodological assumptions are presented in theoretical and practical classes, categorized and correlated in three main modules: I - Fundamental concepts of animal welfare and humanitarian education [EDUHBEA]; II - EDUHBEA applied to pets, production animals, wild animals, laboratory animal facilities, entertainment and work animals; and III - Proposals for EDUHBEA, which are presented in the form of extension and research projects, carried out by the students in the classroom.

Educational Advantages:

Humanitarian Education – Principles of Humanitarian Education are associated with the animal welfare course thus composing the Humanitarian Education and Animal Welfare [EDUHBEA] complex

Interdisciplinary - Establish an integrated and coordinated curriculum between EDUHBEA and other interconnected courses that compose the curriculum. From this perspective there will be a gradual substitution of animal cadavers with mannequins, and software to aid in classes on anatomy, surgical and clinical practice.

Critical and reflexive thinking - Promote and encourage discussion, searching for practical solutions founded on humanitarian handling.

Methodology: After theory is presented, we promote practical activities such as visits to farms, breeders, the zoonoses control center, zoo and laboratory animal facilities, with the aim of establishing a diagnosis of the situation. As a practical tool, a questionnaire is used that contains information on the system of breeding, environment, presence or not environmental enrichment, in addition to a profile of the animal, composed of the following information: body score, degree, intensity and location of injury, evaluation of mental state, which includes stereotypical behavior, intra- and inter-species interactivity or nonresponsive animal.

Issues are addressed regarding the health conditions of herds, production and work animals, colonies for laboratory animal facilities, zoos and/or pets. Later, after the diagnosis of the situation, research and extension projects are developed, founded on the principles of humanitarian education and animal welfare. Aims in this context also include: developing projects jointly with the community and government, such as mass castration campaigns, shipping of animals, campaigns for vaccinations and animal welfare practices. Participation in projects to raise public awareness on health practices, responsible ownership and animal sentience; and finally, encouraging the participation of students, together with the unit’s Animal Experimentation Ethics Committee, in the promotion of ethical and responsible education.

Assessment criteria: to gain approval, these students must present a project or program based on the principles of humanitarian education and animal welfare, as agreed to with the teacher.
Animal welfare content addressed in the teaching strategy, practice or activity

1. Introduction to Animal Behavior; fundamentals of behavior and Humanitarian Education; science, ethics and law; introduction to ethics of animal welfare; establish different points of view on the “moral status” of an animal; learn the main ethical theories and their relation to animals; reflection and ethical arguments on animals; physical, mental and natural welfare; concept of need; welfare and death; anthropomorphism

2. Assessment of welfare and the five freedoms; concept and potential use of the five freedoms.

3. Difference between factors that affect welfare (system data) and the real performance of welfare (effects); use of set Severity, Duration and Number (SDN) to quantify welfare.

4. Physiological indicators of welfare; study the relationship between welfare and physiology; investigate in what manner the autonomic nervous system and neuroendocrine system are associated with changes in welfare; evaluation of physiological, hormonal, behavioral and physiological indicators of stress; the pros and cons of different welfare assessment indicators

5. Behavioral indicators; stereotypical behaviors; animal selection

6. Immunological and production indicators of animal welfare; understand the relationship between welfare and disease and production performance; quantification of disease and production

7. Assessment and handling of welfare on a group level; understand the principles of welfare on a group level; recognize the applications of assessment on a group level; management of health and welfare in group systems; principles of welfare assessment (method, applications, research); voluntary certification schemes; legislation; tools for assistance – preventative medicine; management of health and welfare; health programs for herds

8. Man-animal interaction: pets, utility, work, wild and production.

9. Slaughter of production animals; slaughter as a “process”; aspects related to pre-slaughter, chutes, waiting area, pre-shipping fast; effectiveness of legislation on the protection of animals for slaughter; humanitarian slaughter methods; identify the legal protection of animals at the time of slaughter

10. Euthanasia; criteria for euthanasia techniques and procedures.

Teaching results obtained

Projects conducted during the implementation of the discipline

2004 - FOCA Course, held in our unit in partnership with the City of Araçatuba and the Secretariat of the State of São Paulo.

2006 - “Raise Awareness of Welfare” Project - Fun activity, divided into two modules: module I was produced in the form of a puppet show, and presentations were held in public and private elementary schools; module II organized lectures at secondary schools.

2009 - “Care and Good Practices in Animal Welfare” Project: This compartmentalized project was conducted in Welfare Practices applied to Dogs and Cats with an emphasis on Responsible Ownership, for animals in Zoonoses Control Centers (CCZ) and/or shelters. Welfare practices applied to animals in captivity (Zoo): Lectures for zoo employees on safety, zoonoses and welfare practices. Development of practical activity in environmental enrichment. We aided in the construction of furniture and toys, and documented this on video. Welfare practices for production animals: lectures on health management, with a view to training 5 workers, emphasizing mutual respect and sustainable development, primarily for small rural farmers or on settlements; we distributed material to be used in practices made from recycled bottles.

2011 - ECOVET Project: This project was created based on a proposal for the planting of tree seedlings as a part of welcoming activities for students. The planned arborization of our campus and integration of new and returning students was designed to consolidate knowledge while respecting the dynamic of nature. For the group that is successful with the trees a symbolic “ECOVET Award” is presented at the end of the program, during graduation.

2013 - Welfare Practices as applied to Laboratory Animals: We emphasize ethical principles, legislation and humanitarian handling and animal sentience. Within this scope, we held a workshop entitled “Welfare Practices as applied to Laboratory Animals,” with the aim of training technicians, researchers and students in animal welfare.
Graduate Activities: the discipline Topics in Animal Welfare was taught to graduate students in animal science; we advised on masters theses and dissertations. We also participated in scientific events by presenting works in congresses, symposiums and scientific and academic meetings with the drafting and publishing of results in the form of scientific papers published in indexed journals in the field, thus promoting dissemination of knowledge.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

Given the ensemble of activities conducted over the years, a growing concern with the welfare of animals in the different spheres of the production and breeding process has been noted. The awareness of technicians, researchers and students about sentience, introduction of animal welfare concepts and humanitarian education have been incorporated into our academic environment by many colleagues, facilitating interdisciplinary and contributing to the building of a dynamic approach to animal welfare.

It is also believed, empirically, that over a thousand animals have been benefited by the programs (good practices, castration and responsible ownership) carried out in our unit. Significantly reducing the dog and cat population, primarily on the streets of the city. Also helping to reduce zoonoses and consequently, mistreatment.

Another important point was the training of technicians, researchers and students on humanitarian handling and restraining techniques, enabling the reduction of mistreatment and violence. Ensuring an improvement in the animal welfare at breeders, lab animal facilities and shelters. Also in this sense, the organization of animal health projects, aimed at small breeders, horse-drawn cart owners and settlements contribute to reducing diseases, and improving productivity and consequently promoting not only animal welfare but also that of the individual and the environment.

We participated in initiatives with the zoo in an effort to train handlers and technicians, and aided in the organization of environmental enrichment activities for animals in captivity and developed suggestions for improvement for the facilities. We encourage and promote campaigns on humanitarian education and awareness for animal welfare at schools and public forums, promoting responsible ownership, handling and good practices in animal welfare.

We promoted and participated in events, together with the government and society with the aim of aiding in the construction of intelligent public policies that culminated in the creation of a Municipal Council for the Protection and Defense of Animals in Araçatuba. As a result of the partnership formed between the university, government and society, a link has been created that will benefit activities focused on animal and collective welfare. The construction of a just society founded on the pillars of education and animal welfare depends on the use of education as a transforming factor in the emergence of changes in paradigms in professional practice and citizenship.

Conclusions/ observations/ recommendations

We conclude that learning is a continuous and linear process. As knowledge is assimilated, we acquire understanding. As in any construction process technical knowledge alone is not enough. It must be associated with practice, which combine in the pursuit of solutions.

We recommend: that all content for the course is associated with practical exercises; interdisciplinarity is another very important factor in the success of full assimilation of the course. And for extension activities, partnerships must be established between the university, government and society, to create joint activities to consolidate a just society founded on the principles of humanitarian education and animal welfare.
**Records and evidence of use of teaching strategy, practice or activity**

"Raise Awareness of Welfare" Project

"Care and Good Practices in Animal Welfare" Project
References


Chapter 5

Strategies and teaching practices transverse and / or trans-disciplinary to effective teaching animal welfare
Building a concept of animal welfare at UFFS (Realeza Campus) using a problem-solving methodology: teaching challenges

Denise Maria Sousa De Mello
Brazil

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used

Animal welfare study group

Introduction, context and justification for the teaching strategy, practice or activity

Along with environmental issues and food safety, animal welfare is one of the top three challenges that face agriculture and animal production. Historically programs in veterinary medicine have resisted the introduction of animal welfare as a specific discipline believing that the theme should be addressed under ethics, which permeates other disciplines, without the need to deal with it separately. The UFFS veterinary medicine program offers a course in animal welfare at the end of the program, worth two credits. Animal welfare is a new science, but essential for professionals who work with animals and must be familiar with concepts such as: needs, freedoms, happiness, adaptation, control, ability to predict, feelings, suffering, pain, anxiety, fear, boredom, stress and health. The curriculum of the veterinary medicine program is dedicated to maintaining the physical health of animals, focused on the care, nutrition, hygiene, preventative medicine and treatment of injuries and diseases; however, less attention is paid to the study of how animals feel in the conditions which are imposed on them by humans. For the veterinary medicine program at UFFS, the question is: why not create a course, gradually, involving the academic community, before offering it regularly? What do the subjects [students, teachers, external community] know/understand about animal welfare? This situation prompted the creation of an animal welfare study group, as a place for teaching-learning, discussion and dialogue with aca-
ademic/external communities in an effort to build an animal welfare concept at UFFS. With regard to the teaching and curriculum, we believe that all knowledge that is part of the educational process needs to be meaningful for those who are learning. The rising trend of institutions that offer courses in animal welfare in Brazil is described in the literature and is probably related to the understanding that, by inserting the discipline of animal welfare into curriculums, the universities increase the aptitude of their graduates for the current job market and contribute to advancing ethics in the human-animal relationship.

A problem-solving methodology based on the Maguerez Arch was adopted to awaken the academic community to the will to create a course in animal welfare, in a collective, participatory and meaningful manner, breaking with traditional educational practices centered on the culture of lecture-based classes. The methodology is designed to increase the capacity of the student as a participant and transformer of social reality; stimulating the development of students in a collective manner, so that they are prepared for the challenges of society.

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

The course Ethology and Animal Welfare in the UFFS (Realeza Campus) veterinary medicine program is offered only in the ninth semester, when students are practically leaving the university. The theme is superficially addressed in other courses. Therefore, the intention of applying the problem-solving methodology with the Maguerez Arch, as a teaching strategy, was to gradually build the concept of animal well-being by involving students in the veterinary medicine program, academic and surrounding community. To achieve the objective, it was necessary to break with the traditional (formal) teaching process. We wanted to speak about animal welfare, instead of creating fixed course content with a restricted class load. The teacher, in the current context, needs a certain boldness and a certain set of knowledge, as well as the awareness of the complexity of the teaching act. The teacher must master the art of enchanting, awakening in people of the need to engage themselves and change. Based on this first intention, other objectives were outlined: understand how the academic community perceives the theme animal welfare; create a university culture for scientific, ethical and legal issues regarding the production and use of animals by man; dialogue with these subjects involved in the production chain of animal products on questions related to animal welfare; investigate the perception of animal welfare in the external community; propose educational activities with elementary school students, encouraging children and young people to discuss environmental, sustainability, food safety and animal welfare issues; propose actions in the external community on environmental, sustainability, food safety and animal welfare issues; propose research activities that investigate environmental, sustainability, food safety and animal welfare issues; pressure local government to review norms/legislation on environmental, sustainability, food safety and animal welfare issues; systematize all of the knowledge produced for the course on Ethology and Animal Welfare offered in the ninth semester of the veterinary medicine program for students at UFFS.

Methodology:

Application of the Maguerez Arch methodology:

- **1st stage:** Observe the situation and outline the problem: the course on animal welfare is offered in the ninth semester of the veterinary medicine program. Understand and build the concept of animal welfare at UFFS. Approval of the project “Animal Welfare as conceived by students at UFFS.” Individuals involved: three teachers, four students.

- **2nd stage:** Determine key points: the key points to be studied and discussed, used to support the resolution of the situation-problem, were identified by the group: animal welfare; sentence; five freedoms; human-animal relationship; animal protection laws; and humanitarian education. A framework is a set of interwoven concepts and it is through this mutuality that a correlation of meanings and values is created for a certain conception and action. At this time we begin a parallel action to consolidate perceptions/concepts in animal welfare [The construction of the concept of humanitarian education in schools: teaching animal welfare]. The group grew. There are now eight of us.

- **3rd stage:** Theorization: the subjects begin to understand the problem and question the reason for the events observed in the previous phases. A well-developed theorization leads the subject to understand the problem, not only in its manifestations based on experiences with situations, but also the theoretical principles that explain them. We expand our situation-problem to the external community, where the group went to determine the perception of animal welfare of consumers and veterinary medical professionals in the city of Realeza, Paraná. There are now ten of us. We are recognized as the Animal Welfare Group.
Animal welfare is a broad concept that can be represented in the teaching strategy, practice or activity of the group. Teaching strategies, practices and activities for effective education in animal welfare content addressed in the teaching strategy, practice or activity

Animal welfare content addressed in the teaching strategy, practice or activity

Animal welfare is a broad concept that can be represented as a continuum, from a high-level of welfare to poor welfare, considering all of its variables.

Animal welfare is not an attribute conferred by man, but a quality inherent to the life of the animal. The concept of animal welfare must include their biological and ethological needs, avoidance of suffering, fear and pain. Animals are sentient beings and, therefore, deserve humanitarian treatment. Individuals that experience pain, suffering and pleasure, can be considered, from a philosophical standpoint, a sentient being, an attribute that makes them an object of moral consideration and obliges human beings to fulfill their duties and attend to their interests. Most attempts by scientists to conceptualize animal welfare are summarized in the three viewpoints that express different types of concerns about the quality of life of animals: a) animals must feel well, that is, not be submitted to fear, pain or unpleasant states in an intense or prolonged manner; b) animals must function well, in terms of health, with normal physiological and behavioral growth and functioning; c) animals should lead natural lives through the development and use of their natural adaptations. The assessment of animal welfare is another challenge faced by professionals involved in the field. The criteria used for processing animal welfare are conventionally divided into two groups: measures «based on resources», related to the environment where the animal is located, and measures «based on the animal», related to the state of the animal. The Farm Animal Welfare Council (FAWC) had laid out five basic principles, the five freedoms to be met with regard to animal welfare: 1. Freedom from hunger and thirst; 2. Freedom from discomfort; 3. Freedom from pain, injury, disease; 4. Freedom to express normal behavior; 5. Freedom from fear and distress. Currently, the professions that work with animals are undergoing a transformation that is key to promoting animal welfare, with a demand for knowledge and action in this area. By integrating the teaching of animal welfare in their curricula, universities are better preparing their graduates for the current job market and contributing to advance ethics in human-animal relations. Education is the most effective manner to inform, change habits, values and transform people into disseminators of knowledge and active monitors.

Teaching results obtained

When we began in 2011, there was resistance from the academic community in discussing issues related to animal welfare. One of the positive findings of the Animal Welfare Group was that students who participate play the role of “facilitators” in the academic community. Generally, the students that come to the animal welfare group are motivated to do so by one of the members. Another way of working with the subject ethology and animal welfare was to insert symposiums involving other teachers at UFFS, in an effort to create a dialogue between animal welfare and courses on the subject. The results of the extension and research activities of the animal welfare group served as an example and a benchmark in the classes. Since the creation of the Animal Welfare Group six extension projects, four research projects, a cultural project and four final course papers have been approved. These projects did not come about by chance. There were always researchers to respond to the founding questions of the Animal Welfare Group. We interviewed students from the undergraduate programs in veterinary medicine, nutrition and biology. Of the three programs interviewed, only the veterinary medicine program has a mandatory curricular component in animal welfare. The results show that the perception of animal welfare is still very much focused on the biological aspect. We repeat-
ed the same questionnaire, with the same students of the veterinary medicine program, before taking the ethology and animal welfare course (2.5 years later). We found that the concept of animal welfare was more developed, and ethical concepts were found in addition to biological aspects. The perception of the concept of animal welfare was also investigated with professional veterinarians, consumers of products of animal origin and with family farmers, all in the city of Realeza. The veterinarians provided responses that were very similar to those obtained from students at UFFS, showing a little more knowledge with regard to legislation on the subject. Consumers and farmers said they knew of the subject, but could not define animal welfare. The Animal Welfare Group conducted educational activities on animal welfare in the public and private schools of the city, with elementary school students and teachers. We returned with an expanded proposal: consolidate the construction of an animal welfare concept in the community Realeza (schools, radio, city council, town square, farmers’ market), to change perceptions, values and behavior on the subject. All of the experiences by the Animal Welfare Group were and continue to be important, both for the well-rounded and humanized education of professionals alert to the needs and concerns of society, and to foster research, extension and teaching at UFFS. The triad teaching, research and extension, using a coordinated approach, have been central to the actions of the Animal Welfare Group. Research and teaching activities have promoted a better understanding of the situation and, by extension, the possibility of transforming it.

Impact of the teaching strategy, practice or activity on students, animals, community, etc.

On the institution: In three years, the Group has generated five extension projects and four research projects. In May 2014, the Group approved the Cultural Project – Theater as a Tool for Humanitarian Education: The Five Freedoms of Animal Welfare. ON THE COMMUNITY: The Animal Welfare Group is working with the community of Realeza to promote dialogue between academia and underprivileged society, and help the university define its social role in the community where it operates. The most important indicator of the impact of the activities of the Animal Well for Group is the establishment of partnerships: City of Realeza; public and private schools; city council: the Animal Welfare Group was given time by the City Council of Realeza [second session/2014], to present the Group and information about the concept and importance of animal welfare. The Animal Welfare Group requested collaboration and support from the City Council for the drafting of Bill no. 6 to create a Municipal Fund for Animal Protection and Welfare; Farming Exhibition; Rural Worker Union; Radio Club for Realeza Family Farming. Many properties are used for the field lessons of the course Ethology and Animal Welfare.

On the animals: Direct contact by the Animal Welfare Group with animals is very recent. We began the research project to evaluate welfare, and now we have three final course papers underway. Indirectly, it is believed that by promoting activities for humanitarian education people will learn a little more about nonhuman animals and perceive that they have certain essential needs to live well, regardless of the “use” they make of them.

On the students: When we began the group, there were few students that sought out information about the group’s activities. Over time, the work of the group in the academic community awakened the interest of students and many spontaneously sought to participate in the group. Most of them began the activities on a voluntary basis. Over 20 students have been effectively involved with the group since 2011. The students come to the group to participate in the activities [we have a waiting list of volunteers]. We limit the number of participants because the group has biweekly (study) activities and some weekly engagements, and because the participants are from different programs and years, there is a problem with scheduling meetings. The Animal Welfare Group participated in the Animal Welfare Field Day promoted by the WSPA in 2011 (300 places) and in 2012 (100 places) – “Frontier Veterinarians.” In the veterinary medicine program, we have four students being advised by professors of the group; and four students with projects on the theme of animal welfare being advised by other teachers from the veterinary medicine program. In the group we have students from the programs in veterinary medicine, nutrition and biological sciences.

Conclusions/ observations/ recommendations

Concluding this report (because we have not completed the journey...), we can say that one of the great challenges of this century is the growing search for innovative methodologies that enable teaching practice capable of going beyond the limits of purely technical and traditional training, to effectively prepare students to be ethical, historical, critical, reflective, transforming and humanized beings.
We selected the Maguerz Arch problem-solving methodology because it has transforming and dialogical potential, by focusing on a certain situation, with a view to transforming it on some level. This methodology is composed of five stages with one that is aimed at influencing reality through practical action, intentionally changing it, demonstrating a coherent relationship between thinking and doing, between theory and practice, and between discourse and action.

The richness of this methodology lies in its characteristics and stages that mobilize different intellectual skills of the subjects, but require readiness and effort to systematically follow the basic guidelines and achieve the intended educational results.

Behavioral change is valued in this educational process, although it occurs gradually, and is achieved when intention becomes action. The actions carried out by the Animal Welfare Group were quantitatively and qualitatively significant in the sense that they consolidated questions about animal welfare, at times in an educational/informative manner, at times by evaluating animal welfare in practice.

There are a significant number of works that disseminate the results of the use of this methodology, elaborated particularly for higher education.

To conclude this work, we look to Paulo Freire and his call for constant reflection/action when he said, “knowing that I should respect the autonomy, dignity and identity of the student and in practice strive to act in accordance with this knowledge leads me inevitably to the creation of some virtues or qualities without which that knowledge would be inauthentic, empty and defective” (FREIRE, 2000).
Extension activities in the schools

Extension activities in the “Farming Exhibition”

UFFS Realeza promove atividade de conscientização sobre bem-estar animal

Assessoria

O grupo de estudos em “bem-estar animal” da Universidade Federal do Pará (UFFS) Campus Realeza promoveu uma série de atividades de conscientização a partir deste sábado (6R). Professores e acadêmicos dos cursos de Medicina Veterinária e Nutrição irão distribuir material informativo sobre o bem-estar de animais de produção e de companhia, na Praça Central de Realeza, às 8h. Já na próxima segunda-feira (10), o trabalho será feito nas escolas e colégios da cidade.


Atualmente, o grupo de estudos conta ainda com mais dois projetos de pesquisa “O bem-estar animal na percepção de produtores de leite de agricultura familiar do município de Realeza-PR” e “Bem-estar animal: avaliação das cinco de liberdades em gado de leite da agricultura familiar no município de Realeza-PR”.

Confira o calendário das atividades:
- Dia 08/02 – a partir das 8h: Entrega de panfletos e conversa sobre bem-estar animal.
- Local: Praça Central de Realeza.
- Dia 10/02 – às 20h: Participação na sessão da Câmara de Vereadores, apresentação das ações do grupo bem-estar animal.
- Local: Câmara de Vereadores de Realeza.
- Sábado do dia 10/02: Visita e entrega de folder informativo sobre bem-estar animal nas escolas da rede pública.
References


Understanding the behavior of animals in natural environments to promote minimum levels of welfare

Adriano Braga Brasileiro de Alvarenga
Brazil

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used
Theoretical Frameworks and Special Topics in Animal Behavior

Introduction, context and justification for the teaching strategy, practice or activity
The undergraduate program in biological sciences at the Soure Campus (Marajó Island) has been in existence for four years and its Teaching Policy Project covers disciplines like zoology and physiology. However, these disciplines address a wide range of behavioral categories of animals in a very superficial manner, underestimating some behaviors that are essential to minimizing and/or preventing the stress of animals and, consequently, ensuring a minimum level of animal welfare. The program is conducted in a location with one of the lowest HDIs in Brazil, a place where an unchecked dog population falls victim to the country’s highest rate of Leishmaniasus, with deplorable animal treatment and shipping practices. For example, pigs are tied to bicycles and there is a local culture of mistreatment and consumption of meat from wild animals like iguanas and primates.

In view of this situation and my academic education as an ethologist, I decided to insert an elective course into the curriculum to help shape a more critical opinion about the rights of animals. The course “Theoretical Framework and Special Topics on Animal Behavior” has already been offered to two classes over the last two years and generated a great deal of interest from students in the biology program, who will be the future teachers of the public school system for the city and surrounding area. The course includes field trips, one of them done in conjunction with a veterinarian (and former professor of the Federal Rural University of Amazônia), considered one of
the leading breeders of Buffalo in Brazil, with an emphasis on animal behavior and welfare. In this work, students will serve as disseminators with the aim of minimizing suffering of the animals in the region and as future opinion leaders, who will call for a minimal level of respect for animals, ensuring a good quality of life for them.

**Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity**

- Present basic concepts of animal behavior;
- Demonstrate the behaviors of animals in a natural environment and their needs while in captivity;
- Present basic concepts related to stress and animal welfare;
- Develop a critical awareness of the rights of animals used as pets and for production;
- Raise the awareness of future educators on the mistreatment of animals present in the city;
- Raise the awareness of teachers on their individual role in ensuring animal rights;
- Prepare and educate citizens who will demand animal welfare measures from the government.

**Methodology**

Classes were taught twice weekly using a lecture format with audiovisual aids (slide projector) during the semester, with a total course duration of 102 hours. The subjects were divided into behavioral categories and reading assignments and class presentations (in pairs) of scientific articles related to behavior and animal welfare were given. Seminars were presented (in groups of four students) on the same topic. The class also took a field trip to a private farm in the city where the breeder is a veterinarian (former professor of UFRA) mentioned in the “INTRODUCTION.” In this activity, the students learned the routine for the handling of the buffalo and practices that reduce or prevent animal stress, as well as some strategies adopted by the farm to offer the greatest possible welfare to the animals.

**Animal welfare content addressed in the teaching strategy, practice or activity**

Introduction to animal behavior; introduction to stress and animal welfare: HPA axis and the effects of corticosterone and cortisol; notions of welfare in pets and production animals: handling, facilities, population density, agonism, aggression, evolution, adaptation and function of behaviors (behavioral ontogeny); costs and benefits of behavior; genetics and physiology of behavior; neural mechanisms of control of behavior; biological, environmental and endocrinological rhythms; food behavior; anti-predator and anti-parasite behavior; sexual behavior; social behavior; evolution of cooperation (altruism), costs of life in group and behavioral ecology and animal communication.

**Teaching results obtained**

The teaching results are found in different areas, for example, the higher rate of involvement of students in activities related to the discipline, lower rates of absence, better performance in the course and other areas.

The course contributed to the writing of final papers on the theme and participation of a student who presented a poster at the National Meeting of Ethology at the University of São Paulo (USP) in 2013.

**Impact of the teaching strategy, practice or activity on students, animals, community, etc.**

The students performed better in related courses, showed a change in their conduct in relation to animals and are gradually modifying the actions and thoughts of their colleagues, friends and family members.

The greatest impact on the community is expected when the first class graduates (2015), when students will begin their role as educators and multipliers of initiatives aimed at animal welfare.

**Conclusions/ observations/ recommendations**

With the implementation of the strategy, it can be concluded that it is an activity that will achieve results in the long term. However, beginning these initiatives with a population that is lacking in all respects and observing a behavioral change in a number of students, confirms that it is possible to contribute to reducing animal suffering resulting from mistreatment.
A small critical mass of students can begin a process of promoting the cause on a personal level and at the local government level to implement initiatives that promote animal welfare.

Other professors could also involve their colleagues to promote the activities in other schools in the city, introducing the theme into their routine in group work, lectures, workshops, etc.

**Records and evidence of use of teaching strategy, practice or activity**

Visit to private farm in the city - routine for the handling of buffalo and practices that reduce animal stress, strategies adopted by the farm to offer the greatest possible welfare to the animals.

**References**


Elena de Varona Rodríguez
Cuba

Name of thematic area, program or discipline where the teaching strategy, practice or activity was used
Veterinary Practice and Special José Marti Program

Introduction, context and justification for the teaching strategy, practice or activity
The theme animal welfare is important on a social, legislative and professional level. In addition, researchers and politicians associate animal welfare with food safety, suggesting that, with improved animal welfare, safer food is produced. Maintaining animal welfare implies respect for the five freedoms (Brambell, 1965). These concepts coincide with five broad fields of study in production and reproduction, nutrition, housing, animal health, animal behavior and physiology.

It is necessary to recognize Dewey, who formulated one of the first and most important contributions to education as a practical activity, with his famous teaching principle learning by doing and his equally important proposal to associate research skills with an opening of minds, responsibility and honesty; weaving a network with bridges that connect the latent abilities of students, teachers and the community. When these abilities are combined, the only thing that remains unchanged is constant growth.

The School of Agricultural Sciences at the University of Camagüey has continually participated since 2008, with good results, in various scientific forums such as: Science Day, Student Forums and Provincial, National and International Events, where ties are strengthened for academic collaboration and exchange, including ties with the distinguished Gobernador Gregores Agricultural School in Santa Cruz, Argentina. This association and cooperation enables the animal welfare theme to be developed holistically, since, as explained, this collaboration is of funda-
mental importance for the students to expand their vision of animal welfare in other countries and other approaches, on one hand, that the university, but, on the other, broader still due to the nature of knowledge. The main objective of this project was to contribute to the preparation of specialists with an up-to-date view of domestic and international problems regarding animal health and the current major trends.

The projects, content and teaching strategies for science education should, therefore, adjust to the interests and experiences of the students, enabling the construction of new models that explain the achievements and phenomena in the different contexts and fields of knowledge. The classroom, and other institutional ambits, such as university extension, are transformed into a place of exchange, of different points of view, thinking and routines.

Objectives, skills and/or teaching aim achieved by implementing the teaching strategy, practice or activity

- Contribute to the development of educational activities that provide and facilitate the acquisition of skills in research and dissemination that enable the discovery and the assimilation of values, principles and methodologies, in science and technology, supplying an appropriate environment for the improvement and acquisition of knowledge as a social construction.
- Foster and develop the communication skills of students by presenting works in science and technology.
- Carry out science and technology projects in participating institutions.
- Exchange of educational experiences between different participants.
- Promote exchange and collaborative participation of students with the different animal welfare associations and foundations in Latin America and the Caribbean (communication by e-mail).

Methodology

Our approach covers the essential stages of scientific methodology: Recognize the problem, search for information, formulate a hypothesis, select strategies to resolve and confirm or reject the hypothesis.

Program Proposal: (For the Student Science Group)

Distribution according to type of teaching: classroom - 60 hours, practical - 60 hours, graded on submission and discussion of research protocol (cover of the project to be introduced) and final workshop - 2 hours. Distribution by type of class: conferences - 14 hours, seminars - 14 hours, practicals - 32 hours, for a total of 60 hours

Student evaluation process: At the start of each class (conference), and the theme to be developed at the final workshop (last meeting) is indicated.

Develop a research protocol and evaluate the skills and abilities that the students acquire. * Conducted during the community project, as well as during the student field trip to the national zoo and aquarium in Havana.

Comprehensive Final Workshop: The research report for the practical is submitted a week in advance and the works are presented (with the theme submitted at the first meeting). These presentations are evaluated individually, but are presented by the research team (composed of three to four students).

Methods for the dissemination and application of the animal welfare principles: Research on the handling practices and conditions, informative material is handed out, theoretical basis with audiovisual support, field study and/or visits to evaluate practice and demonstration, discussion and exchange of experience and anonymous feedback from the participants.

Animal welfare content addressed in the teaching strategy, practice or activity

At our school, we teach animal welfare as a theme within the courses or subjects below:

Veterinary Practice

- C. Generalities (Introduction and conceptual framework) Five Freedoms or Rights. S. Film Temple Grandin. Film discussion.
- S. National and international legislation regarding animal welfare (in conjunction with professors of the law school)
- CP. Hand out the animal welfare research guide that will be used during the course. Search for information and contact by students with animal welfare websites in Latin America and the Caribbean.
José Martí philosophy associated with the profession.

- Outside class activity (José Martí: protection and animal welfare)
- S. Use of alternatives in veterinary education [LABTED]
- CP. Search of sites dedicated to animal welfare

**Physiology**

- C. Physiology of stress. Physiological response.
- Outside class exercise recommended on Chapter 3 of Animal Liberation by Peter Singer
- C. Ethology and motivational systems of behavior.
- Outside class exercise recommended
- CP. Ethology (Animal Facilities)
- C. Physiological aspects of pain and fear
- CP. Assessment of animal welfare and physiological indicators. Conduct research (Zoo)
- Clinical practice and surgery
- C. Animal welfare and Ethics (Veterinary clinic)
- CP. Conduct research with clients (Veterinary clinic).

**Animal science and health**

- CP. Conduct work with animals and patients (Center for horse therapy, city zoo)
- Graduate and undergraduate (Masters PAS, Mention: Cattle)

- C. Animal Welfare and Sustainable Animal Production.
- Content: The senses of animals, the principal of the flight zone, design of facilities, devices for immobilization, handling and stress, humanitarian slaughter, animal welfare in handling and processing.
- CP. Statistical processing of research.

**Epizootiology**

- C. Animals in disasters. Risk management.

**University extension activities**

- Both domestic and international specialists of animal welfare are coordinated and invited
- PL. Assessment of animal welfare and physiological indicators.
- Animal welfare of pets. Welfare problems of animal groups and their implications (cats, dogs, national aquarium and national zoo)
- CP. Creation of PowerPoint presentation.
- TF. Presentation and/or exhibition of work, research on animal welfare

**Teaching results obtained**

Student became more motivated and took charge of various university and extension initiatives.

We combined efforts for the extension activities, which were carried out with students from other schools, such as law, journalism, sociocultural studies and economics; as with students from the “Carlos J. Finlay” University of Medical Sciences, participants of the 120 Year Club (AMECA).

The school will continue to teach undergraduate and graduate students, but, by converting the study into an activity for a lifetime, instead of something that we stop doing when we become “adults,” schools will have to organize approaches for lifetime education. The schools will have to be converted into “open systems.”

Into this strategy were inserted the José Martí Cultural Society and the “Antonio Núñez Jiménez” Honorary Chair of Nature and Man, the only one of its kind in the country, attributed to the foundation bearing the same name.

And now we need a new axiom: “The more instruction a person receives, the more education and culture this person will need.” But there is something even more important: access to higher education, without discrimination based on age or previously earned educational credentials, is a social need. Each individual should be able, at any stage in their lives, to continue their formal education and prepare themselves to work with knowledge (emphasis on the academic careers of the older generation).

The formation of knowledge is the greatest investment any country can make. Certainly, the return that a country or company receives from knowledge will increasingly determine its competitiveness. Knowledge productivity will be decisive in economic and social success and in global economic performance. And we know that there are tremendous differences in productivity on a world scale between industries and between individual organizations.
Impact of the teaching strategy, practice or activity on students, animals, community, etc.

On the animals: contribute to the rescue, improvement and protection of animals

*With emphasis on indigenous or endemic species [Hispano-American].

On students: stimulate attitudes, values and vocation with ethics and professionalism in future veterinarians. Transform the scenario by transforming them from mere spectators into active leaders, playing the role of cultural promoters of animal welfare.

On the institution: promote research needs and associated technological development. Expand the vision of the world of science and technology for those who participate and familiarize them with the state of the nation. Make the interdisciplinary and transdisciplinary character of knowledge visible.

On the community: promote the consolidation of communities, practices, teaching and knowledge, contributing to strengthening ties with the community.

Contribute to establishing a significant human relationship between teachers, students, specialists, family environment and society in general.

Disseminate knowledge, education and research that generates recognition and social inclusion [Associations like: ANSOC (deaf dumb), ANCI (blind and visually impaired) and ACLIFIM (people with physical disabilities), all members of the AMECA 120 Years Club].

Conclusions/ observations/ recommendations

Contribute to the education of animal welfare leaders, capable of recognizing the ethical and productive benefits of good work and immobilization practices by teaching the principles of handling based on animal behavior.

In this context it is important to focus on animal welfare, which will result in more, better quality and safer food.

Higher education is entering a new era, where the experience accumulated will determine a notable qualitative leap, with a positive outlook for the full development of our countries, which will result in the success of all the existing animal welfare projects, which, in turn, will improve the quality of life of the peoples of Latin America and the Caribbean.

Recommendations:

This study was produced for (and adapted to its conditions) the No. 1 Provincial Agricultural School, Governor Gregores, Santa Cruz, Argentina, and coordinated by Professor Juan Beltramino.

Working in pursuit of the collaborative implementation of a Latin American and Caribbean academic network for animal welfare.
Teaching strategies, practices and activities for effective education in animal welfare

Records and evidence of use of teaching strategy, practice or activity

Independent study and in teams – Student Seminar and Final Workshop

Educational technology laboratory, film discussion and information search
Teaching strategies, practices and activities for effective education in animal welfare

University Extension Activities
References


De Varona Rodríguez, E.; Terraza Gastelúm, T. (2013). Bienestar de las abejas, CYTDES. Universidad Ignacio Agramonte y Loynaz (3 al 5 de junio), Camagüey, Cuba.


