

Perceptions of Veterinary Students at North Carolina State University about the Use of Animals in Teaching and Research

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Teaching through the use of animals is an integral part of veterinary education. In addition to interactions with privately owned animals, veterinary students often learn using cadavers and institutionally owned animals. Veterinary students also frequently participate in research involving animals. Animal-based research is essential for the development of therapies and techniques that improve the lives of both animals and people. To investigate the perceptions of veterinary students at the North Carolina State University, College of Veterinary Medicine (NCSU-CVM) toward the use of animals in teaching and research, an anonymous survey was provided to current and recently graduated veterinary students. The aims of the study were to 1) gain a general understanding of veterinary student perceptions surrounding the use of animals in research and teaching, 2) determine if providing simple facts about the contributions of animals to medical advancements would increase the acceptance of animal use for teaching and research, and 3) determine if general perceptions regarding the use of animals in teaching and research change over the course of completing the veterinary curriculum. Descriptive statistics and frequency distributions were calculated for applicable response types. χ^2 tests were used to identify factors that influenced perceptions of the use of animals in teaching and research. A change-indicator variable was created, and binary logistic regression was used to compare responses before and after completion of the educational component of the survey. Of 141 total survey respondents, 78% were accepting of the use of animals in teaching and research, with no significant difference in the overall acceptance after reading 6 facts about animal research. In addition, 24% of respondents stated that their perceptions had changed during the course of their veterinary education. Overall, veterinary students surveyed had a high acceptance of the use of animals in teaching and research.

Abbreviations and Acronyms: NCSU-CVM, North Carolina State University, College of Veterinary Medicine

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Introduction

The veterinary profession is committed to animal welfare and the prevention and relief of suffering,^{3,9} but it also depends on the medical advances made through the use of animals in biomedical research. However, the need to use live animals in teaching and research has long been publicly debated. Within the United States, approximately 50% of the population approves of using animals in research.⁹⁻¹² Similarly, a survey in the United Kingdom found that two-thirds of the population could accept animal research for medical or scientific purposes when an alternative was not available.⁶ Gallup's 2022 annual moral acceptability poll found that approximately 52% of the US public found medical testing on animals to be morally acceptable.⁹ Gallup has asked the US public the same question since 2001; in that year, 65% of those polled found medical testing on animals to be morally acceptable.⁸ However, moral acceptance was 56% in 2020 and is currently 51%.⁹

The use of animals for teaching and research is integral to training veterinarians, providing an evidence base for human

and veterinary medical practice, and achieving medical advances in the future. Both healthy and unhealthy animals are used to train veterinary students at all American Veterinary Medical Association-accredited veterinary schools.² Just as physicians learn to practice medicine by working with healthy and sick human patients, veterinarians learn to practice medicine by working with healthy and sick animal patients. In addition, veterinarians who provide clinical care for research animals undergo focused training in Laboratory Animal Medicine, which is a recognized specialty area within the veterinary medical profession. These veterinarians are specifically trained to diagnose, treat, and prevent diseases in research animals. Furthermore, veterinarians working with research animals are committed to the welfare of research animals. Thus, veterinary students and veterinarians are likely to have a unique perspective on the use of animals in teaching and research.

Unlike the US surveys, a UK survey⁶ asked participants "Which, if any, sources of information would you trust to give balanced information about the use of animals in scientific research?" In 2018, 45% of respondents stated they would trust "the vets who look after the animals in research." Additionally, in a 2002 poll, UK citizens were asked to describe their trust in different professionals; 94% of survey respondents said they trusted veterinarians either "completely" or "generally."⁵ Indeed, members of the public often seek the opinions of veterinarians as a trusted resource, and informed opinions are crucial to

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educating the public and maintaining trust between the public and veterinarians.

Every veterinary student at the North Carolina State University, College of Veterinary Medicine (NCSU-CVM) is exposed to cadavers, privately owned animals, and institutionally owned animals that are kept for instructional purposes as part of the standard curriculum. In addition, veterinary students at the NCSU-CVM are offered formal education on laboratory animal medicine and the regulations surrounding the use of animals in teaching and research in both the core and elective curricula.

Considering the current need to use animals in teaching and research and the public trust in veterinary professionals, the objective of this study was to obtain a broad understanding of how veterinary students and recent graduates from the NCSU-CVM perceived and accepted the use of animals in teaching and research. The study also aimed to investigate how the veterinary curriculum itself affected that perception. We hypothesized that providing 6 facts about animal research to veterinary students and recent graduates would increase their overall acceptance of the use of animals in research and teaching.

Materials and Methods

Participants. The study protocol was reviewed and approved by the Institutional Review Boards at both the North Carolina State University and Vanderbilt University Medical Center. Respondents that chose to participate were required to answer an informed consent question before beginning the survey. All survey data were anonymous, and participation was voluntary. Participants did not receive compensation or academic credit for completing the survey.

Survey. The survey was designed and administered using the web-based survey tool REDCap (Version 10.0.0, Vanderbilt University, Nashville, TN). The survey began by asking 7 demographic questions. Thirteen questions regarding acceptance of the use of animals in teaching and research followed (Table 1). Participants were then presented with 6 facts (Tables 2 and 3) about the use of animals in teaching or research and their contributions to medical progress. Eleven of the original 13 questions were then repeated to determine if awareness of those 6 facts would immediately change the participant’s attitudes (Table 4). An additional, open-ended question concluded the survey. Respondents were prevented from seeing their original responses and from reviewing the 6 facts once they reached the repeated

Table 1. Survey, part 1

All in all, do you favor or oppose the involvement of live animals in scientific research	<input type="checkbox"/> Favor <input type="checkbox"/> Oppose <input type="checkbox"/> Neither/Nor <input type="checkbox"/> Don't Know
How strongly do you agree or disagree with the following statements about the involvement of live animals in scientific research in the United States?	
I can accept medical research with live animals when there is no alternative.	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither Agree Nor Disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
I can accept research with live animals to help our understanding of human health when there is no alternative.	
I can accept research with live animals to help our understanding of animal health when there is no alternative.	
I can accept all types of research with live animals when there is no alternative.	
I can accept working with live laboratory animals for nonterminal teaching purposes.	
I can accept working with live privately owned animals for nonterminal teaching purposes.	
I can accept working with live laboratory animals in terminal procedures for teaching purposes.	
I cannot accept working with any live animals for teaching purposes.	
I cannot accept any scientific research with live animals.	
Medical research with live animals is important to human AND animal health.	<input type="checkbox"/> True <input type="checkbox"/> Not True
Which, if any, sources of information would you trust to give balanced information about the involvement of live animals in scientific research (check all that apply)?	<input type="checkbox"/> Veterinarians who look after the animals involved in research <input type="checkbox"/> Animal Rights Organizations <input type="checkbox"/> National Institutes of Health (NIH) <input type="checkbox"/> Veterinarians who work in private practice <input type="checkbox"/> Disease specific advocacy organizations (ex: American Cancer Society, Breast Cancer Foundations, Alzheimer's Associations, etc.) <input type="checkbox"/> Other: please specify
How strongly do you agree or disagree with the following statements: My view on scientific research with live animals has changed since beginning my veterinary school education.	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither Agree Nor Disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
If you agree or strongly agree, how have your views changed?	Free text response

Table 2. Survey, part 2; educational component

The following statements are TRUE. Please select whether you did or did not know the statement was TRUE.	
Did you know that at least one veterinarian must review all live animal research proposals before they can begin?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Did you know that hamsters, mice, and cattle were involved in discovering that human papilloma viruses (HPV) can cause cervical cancers?	
Did you know that the laboratory mouse was instrumental in the developmental of the rabies vaccine, used today in humans and animals?	
Did you know that through studies with dogs, scientists first discovered insulin, a drug used by approximately 24 million patients in the U.S. today?	
Did you know that horses were instrumental in the development of the tetanus vaccine, used today in humans and animals?	
Did you know that 95% of laboratory animals are rats, mice, and other rodents?	

Table 3. Percent of respondents who were aware that the presented statement was true before taking the survey

At least one veterinarian must review all live animal research proposals before they can begin.	93%
Hamsters, mice, and cattle were involved in discovering that human papilloma viruses (HPV) can cause cervical cancers.	44%
The laboratory mouse was instrumental in the development of the rabies vaccine, used today in humans and animals.	67%
Through studies with dogs, scientists first discovered insulin, a drug used by ~24 million patients in the U.S. today.	62%
Horses were instrumental in the development of the tetanus vaccine, used today in humans and animals.	48%
95% of laboratory animals are rats, mice, and other rodents.	96%

Table 4. Survey, part 3, repeated questions and conclusion of survey

With the previous true statements in mind, please answer the following questions.	
All in all, do you favor or oppose the involvement of live animals in scientific research?	<input type="checkbox"/> Favor <input type="checkbox"/> Oppose <input type="checkbox"/> Neither/Nor <input type="checkbox"/> Don't Know
How strongly do you agree or disagree with the following statements about the involvement of live animals in scientific research in the United States?	
I can accept medical research with live animals when there is no alternative.	<input type="checkbox"/> Strongly Disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither Agree Nor Disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly Agree
I can accept research with live animals to help our understanding of human health when there is no alternative.	
I can accept research with live animals to help our understanding of animal health when there is no alternative.	
I can accept all types of research with live animals when there is no alternative.	
I can accept working with live laboratory animals for nonterminal teaching purposes.	
I can accept working with live privately owned animals for nonterminal teaching purposes.	
I can accept working with live laboratory animals in terminal procedures for teaching purposes.	
I cannot accept working with any live animals for teaching purposes.	
I cannot accept any scientific research with live animals.	
Medical research with live animals is important to human AND animal health.	
What else would you like to tell us about your views on the involvement of animals in research or teaching?	Free text response

portion of the survey. The survey instrument, less the demographic questions, is presented in Tables 1, 2, and 4. The survey questions were developed by the authors with refinements and guidance from the Vanderbilt University Medical Center Qualitative Research Core to avoid bias. Survey functionality was tested by the authors and a small team of collaborators prior to distribution, which took place via email invitation through email lists of the NCSU-CVM. Using the email lists, the survey was administered to approximately 600 current or recently graduated students. The approximate response rate was 24%; however, because some intended recipients may not have received the email due to inherent problems with email lists, the percentage of responses may have been higher. The survey was open for responses between August 26, 2019, and October 17, 2019. After the initial email requesting participation, 2 additional email reminders were sent. Data collected through

the survey tool were analyzed in a statistical software program (IBM SPSS Statistics, Version 26.0, Armonk, NY).

Statistical analysis. To evaluate changes in perceptions before and after the presentation of 6 facts on animal research, a change-indicator variable was created in which the variable was set to one when the participant's attitude toward animal use was more positive at follow-up (more accepting of the use of animals in teaching and research), and was otherwise set to zero. Responses to the attitude questions were compared with regard to demographics by using a χ^2 test. Values of $P < 0.05$ were considered significant.

Results

Demographics. The survey had 169 respondents. Of those, 141 participants completed the entire survey. Incomplete survey data was discarded without analysis, resulting in an approximately 24% total response rate.

The ages of the respondents ranged from 21 to 50 y (average = 27 y). Of the 141 respondents, 109 (77%) identified as White, 9 (6%) as Hispanic or Latino, 9 (6%) as Black or African American, 2 (1%) as Native American or American Indian, 9 (6%) as Asian or Pacific Islander, and 2 (1%) as other; 1 respondent preferred not to answer. With regard to gender, 119 (84%) of the respondents identified as female and 20 (14%) identified as male; 2 respondents preferred not to answer.

In regard to the highest level of education attained before attending veterinary school, 124 of 141 respondents (88%), reported that they had obtained a bachelor's degree, 11 (8%) reported obtaining a master's degree, 2 (1%) reported they had obtained an MD, 2 (1%) reported obtaining a PhD, and 2 (1%) reported having some college, but no degree before attending veterinary school.

The 141 survey respondents included 18 graduates from the class of 2018 (13%) and 12 from the class of 2019 (8%). Respondents also included 25 students from the class of 2020 (18%), 33 from the class of 2021 (23%), 22 from the class of 2022 (16%), and 30 from the class of 2023 (21%). One respondent was a DVM-PhD dual degree student who expected to graduate in 2025 (< 1%).

Of the 141 respondents, 43 (30%) had worked in scientific research without direct live animal contact and 77 (55%) had worked in scientific research with direct live animal contact prior to pursuing their DVM. The remaining 21 respondents (15%) had no scientific research experience prior to attending veterinary school.

Attitudes toward animal use. The survey included 11 questions on the use of animals for research or teaching. Questions were presented in a combination of formats including multiple choice, true/false, and statements with which the participant could agree or disagree on a 5-point Likert scale. The first question was, "All in all, do you favor or oppose the involvement of live animals in scientific research?" Survey respondents were largely in favor of animal research, with 78% in favor, 6% opposing animal research, 12% neither favoring nor opposing animal research, and 3% selecting "don't know." Table 5 shows the distribution of responses to the 9 questions with a response scale from strongly disagree to strongly agree. The first 7 of these questions were written with an affirmative connotation ("I can accept..."), and the last 2 were written with a dissenting connotation ("I cannot accept..."). For the latter, a

disagreement showed a favorable attitude toward animal use. For 7 of the 9 questions, favorable attitudes were present in over 90% of participants. Two questions, one regarding all types of research and the other regarding using animals in terminal procedures for teaching, showed more varied responses with only 60% agreeing or strongly agreeing with the statement. A final true or false question asked, "Medical research with live animals is important to human AND animal health", 139 of 141 respondents (99%) answered "true."

Responses to all questions were compiled and compared across respondent demographics using a χ^2 test. Two demographic factors had significant effects on responses. In response to the true/false question "I can accept working with live laboratory animals in terminal procedures for teaching purposes", participants who had worked with animals in scientific research were more likely to strongly agree than participants who had not worked with animals in scientific research ($P < 0.02$). Responding to "I cannot accept any scientific research with live animals", participants with animal research experience were more likely to strongly disagree and less likely to agree than the participants without animal research experience ($P < 0.04$).

Educational component. In the middle portion of the survey, participants were presented 6 facts regarding animal research and were asked whether they knew if the statement was true (Table 2). Table 3 shows the 6 statements and the percentage of respondents who knew that the statement was true. For every statement, at least one respondent knew the statement was true. However, there were no statements for which all participants already knew the material.

Changes in attitude. To conclude the survey, students were asked 11 of the 13 initial questions (Table 4). The aim of repeating the questions was to determine whether presentation of the 6 facts in the educational component of the survey would immediately change the participant's perceptions. A change-indicator variable was created and set to one when the student's attitude was more accepting of animal use in teaching and research at follow-up, and was otherwise set to zero. Responses to 7 of the questions had 6 or fewer participants with changes, demonstrating a persistent attitude (Table 5). However, 4 of the questions showed a change in 9 to 18 responses, suggesting flexibility in respondent attitude toward the subject matter (Table 5).

Table 5. Distribution of responses from strongly disagree to strongly agree. Data presented as the number and percentages of responses in each response category. The total number of respondents was 141.

Question	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I can accept medical research with live animals when there is no alternative.	0 (0%)	1 (< 1%)	5 (4%)	36 (26%)	99 (70%)
I can accept research with live animals to help our understanding of human health when there is no alternative.	1 (< 1%)	4 (3%)	5 (4%)	35 (25%)	96 (68%)
I can accept research with live animals to help our understanding of animal health when there is no alternative.	0 (0%)	3 (2%)	3 (2%)	35 (25%)	100 (71%)
I can accept all types of research with live animals when there is no alternative.	6 (4%)	27 (19%)	23 (16%)	37 (26%)	48 (34%)
I can accept working with live laboratory animals for nonterminal teaching purposes.	1 (< 1%)	0 (0%)	5 (4%)	32 (23%)	103 (73%)
I can accept working with live privately owned animals for nonterminal teaching purposes.	2 (1%)	3 (2%)	2 (1%)	36 (26%)	98 (70%)
I can accept working with live laboratory animals in terminal procedures for teaching purposes.	11 (8%)	21 (15%)	24 (17%)	43 (31%)	42 (30%)
I cannot accept working with any live animals for teaching purposes.	100 (71%)	34 (24%)	3 (2%)	3 (2%)	1 (< 1%)
I cannot accept any scientific research with live animals.	105 (75%)	31 (22%)	3 (2%)	2 (1%)	0 (0%)

Table 6. Binary logistic regression analysis data. The resultant coefficients (β) of each model are shown under the significant predictors of attitude change. * = $P < 0.05$, ** = $P < 0.01$

Item	Total number of responses that changed	Significant predictors of attitude change			
		Previous nonanimal research experience	No previous research experience	Age	Nonwhite
I can accept all types of research with live animals when there is no alternative.	18	1.23	6.98**	0.76**	0.76**
I can accept working with live laboratory animals for nonterminal teaching purposes.	9	1.37	1.86	0.92	0.95
I can accept working with live privately owned animals for nonterminal teaching purposes.	9	5.76*	1.92	0.98	1.33
I can accept working with live laboratory animals in terminal procedures for teaching purposes.	15	0.78	2.56	0.89	3.75*

For the 4 questions that showed changes in attitude, a binary logistic regression analysis was conducted and is presented in Table 6. Three of the models identified significant predictors of this attitude change. For the question, “I can accept all types of research with live animals when there is no alternative,” having no previous research experience was associated with greater odds of an attitude change to a more favorable view of the use of animals in research and teaching after the educational component of the survey. In contrast, older participants and nonwhite participants were less likely to change their attitudes in either direction. The question, “I can accept working with live privately owned animals for nonterminal teaching purposes,” revealed a significant predictor of change among students with previous nonanimal research experiences. These participants had a higher odds ratio and were more likely to exhibit a shift toward acceptance of animal use in research and teaching after the educational component of the survey. The third question with significant change predictors was, “I can accept working with live laboratory animals in terminal procedures for teaching purposes.” For this question, nonwhite students had a higher odds ratio, again exhibiting a shift toward a more accepting view of the use of animals in research and teaching after the educational component of the survey. No significant predictors were identified for the question, “I can accept working with live laboratory animals for nonterminal teaching purposes.”

Change over the course of curriculum. The survey also asked subjects if they agreed or disagreed with the following statement: “My view on scientific research with live animals has changed since beginning my veterinary school education.” Of the 141 respondents, 14 (10%) strongly disagreed, 48 (34%) disagreed, 45 (32%) responded as “neither agree nor disagree”, 28 (20%) agreed, and 6 (4%) strongly agreed.

The 34 respondents who agreed or strongly agreed were then asked to elaborate on how their views had changed. These free text responses were scored to determine if the change described was a shift toward a more accepting view, a less accepting view, or if the response was neutral. Of the 34 responses, 10 were scored as neutral, 3 as a shift toward a less accepting view, and 21 as a shift toward a more accepting view. The neutral responses often included comments about how awareness of why or how animals were used in research and teaching had increased but resulted in no appreciable change in view. The 3 responses that were scored as less accepting included the phrases “I have concerns with proper animal care in research settings”, “More opposed to use of animals in research”, and “I am more opposed to research with live animals since starting vet school.” Of the 21 responses that showed a shift toward greater acceptance, comments included “I did not think it was truly necessary but now I do”, “I have a better view of how research with live

animals helps both animal and human medicine progress”, “I learned more about their necessity in teaching”, and “prior to vet school I thought models were an acceptable teaching tool, but after using models and working with cadavers and other live specimen it is hard to compare the knowledge and experience you get from using the real thing. Models are helpful but they are only so helpful.”

Trusted sources. The survey also asked the question “Which, if any, sources of information would you trust to give balanced information about the involvement of live animals in scientific research?”. Respondents could choose all that applied. For the 141 respondents, the 2 most trusted sources included “veterinarians who look after the animals involved in research” and the National Institutes of Health (NIH), with 136 (96%) and 116 (82%) responses, respectively. Less trusted sources included “disease specific advocacy organizations” (52 responses), veterinarians who work in private practice (40 responses), and animal rights organizations (6 responses). Ten individuals selected “other” and gave free text responses including “the Institutional Animal Care and Use Committee (IACUC)”, “animal welfare organizations”, and “the American Association for Laboratory Animal Science (AALAS)”. One respondent wrote, “I do not trust any single resource to give the entire story.”

Discussion

A primary goal of this research was to determine how veterinary students in the US perceive the use of animals in research and teaching by focusing on a subpopulation of students and recent graduates from the NCSU-CVM. This population of survey participants had a largely favorable view of using animals in research and teaching, 78% of survey respondents indicating acceptance. In addition, while some students communicated that their perceptions had changed over the course of the veterinary curriculum, this was not consistent across the population, nor were all changes in the same direction.

The curriculum at every AVMA-accredited US veterinary school exposes students to privately owned animals, cadavers, and/or institutionally owned animals for instructional purposes. A 2015 publication provides an inclusive review of animal use in research and veterinary education, pointing out that the use of animals in the veterinary curriculum is extensively studied and its necessity repeatedly re-evaluated.⁷ This re-evaluation includes the implementation of alternatives to the use of live animals. These alternatives are gaining acceptance together with the development of Clinical Skills Laboratories.⁷ However, despite these alternatives, the article concludes that the use of animals will likely continue to be a necessary and significant part of the veterinary curriculum for the foreseeable future.⁷

The data presented here is limited by the small sample size, a sample population that is limited to one veterinary school, and a population of students that was not extensively diverse and whose participation in the survey was voluntary. Nonetheless, the largely favorable view of using animals in research and teaching is likely a true finding as it is consistent with the overall higher acceptance rate of animal research seen in individuals with an advanced education.⁶ In a 2020 study, the acceptance rate of animals in research was approximately 89% among medical students who were members of the American Academy of Neurology.⁴ Veterinarians, like physicians, often undergo over 7 years of education beyond high school before graduating from veterinary school. Compared with the approximately 50% acceptance rate of the public,^{6,9-12} our results are consistent with findings from this previous study⁴ and support the conclusion that higher education may result in a higher acceptance of animal research.

Among the survey respondents, 15% (21 individuals) had not participated in a research activity (with or without animals) before entering veterinary school, and therefore the large proportion of respondents with prior research experience may have resulted in bias. However, further analysis of this subset of participants who reported no research experience before veterinary school revealed that 67% of these participants had a favorable view of the use of animals in research and teaching; only a single participant changed their view from “Don’t know” to “Favor” in the repeated assessment (Survey Part 3: Table 4). Research experience is part of the standardized veterinary school application (Veterinary Medical College Application Service), and hours in research do apply toward the minimum required experience hours for admission. In fact, according to the Association of American Veterinary Medical Colleges, the average applicant in 2018 to 2019 reported 380 hours of research experience.¹ Further assessment of the impact of research experience on the perceptions of animal use in research and teaching is a worthy endeavor. However, with such a large proportion of veterinary applicants having some prior research experience, determining differences in views based on this factor may be difficult and may simply be related to the positive effect of higher education on the acceptance rate of animal use in research and teaching.

Future studies of the attitudes of the veterinary community toward animal use in research and teaching could expand the survey population to include students and veterinarians educated at other institutions. Anonymous survey tools are useful, but have inherent limitations, including the inability to verify reported information, limited control over the responding population (perhaps leading to sampling bias), and, often, the inability of respondents to ask questions or provide clarification within their responses. Surveying medical and undergraduate students, as well as students at other veterinary schools may help to indicate whether higher education in general leads to a higher acceptance of animal-based research and/or which components of the veterinary curriculum lead to a higher acceptance rate. The high initial acceptance rate of survey participants in this study hindered the likelihood of finding a statistically significant increase in acceptance after the educational component of the survey. However, administering the survey to the public and other populations may reveal that the presentation of 6 novel facts would lead to a statistically significant increase in acceptance for those with nonveterinary backgrounds. If indeed specific components of the veterinary curriculum lead to a higher acceptance rate, these components could be used

by animal research advocacy groups to tailor educational and outreach materials.

An example of tailored outreach material can be drawn from the data collected in the educational component of this study, which consisted of the presentation of 6 facts about the use of animals in research and teaching. Over 90% of respondents already knew that at least one veterinarian must review all live animal research proposals before the research can begin and that 95% of all animals used in research are rats, mice, and other rodents. A lower percentage of medical students, undergraduate students, and members of the public may be aware of these facts. Therefore, learning these facts through targeted outreach materials could change opinions about animal-based research. In our study, less than 50% of respondents knew that hamsters, mice, and cattle were involved in the discovery that human papilloma viruses (HPV) can cause cervical cancers and that horses were instrumental in the development of the tetanus vaccine. Respondents were least aware of the facts about the less common research species. Providing outreach materials that include information regarding the less common research animals, such as cattle and horses, could shift public perceptions toward a more favorable or accepting view of animal involvement in research and teaching. However, veterinarians and veterinary students in all types of practice should understand the critical role of various species in biomedical research and medical advancements for both human and veterinary medicine. The equipment, tools, techniques, and medications used every day in the practice of veterinary medicine were and continue to be developed and tested using research animals. These advances include discoveries such as the mechanism of diabetes and development of insulin, development of advanced surgical techniques including microsurgery and organ transplantation, and safety testing of most of the pharmaceutical products prescribed today including antibiotics and vaccines.⁷

Finally, because the public often considers veterinarians to be trusted professionals,⁶ the targeted education of veterinarians is important. The inclusion in the veterinary curriculum of information on the role of animals in research and teaching helps veterinarians to provide the public with accurate information on this topic. In addition, because of public trust in the profession, veterinarians may be strong allies for educational and outreach organizations that seek to distribute accurate information about the use of animals in research.

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