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Animal Rights Attitudes Among Veterinary Students: Associations with Sociodemographic Characteristics

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Simple Summary

Understanding veterinary students' attitudes toward animal rights can inform discussions about their future professional responsibilities. We surveyed 400 veterinary students at one university in Türkiye, and the main analyses included 354 students who answered all retained scale items. Female students and students who owned pets had more favorable attitudes in the initial comparisons. When the measured characteristics were considered together, attitudes were associated with sex, class year, and place of residence, while the association with pet ownership was less clear. These findings concern general animal-rights attitudes and do not show which approaches to stray-animal management students support. Because the study was conducted at a single faculty at one point in time, it cannot establish causes or changes during veterinary education. Studies involving other faculties and following students over time could help clarify these relationships.

Abstract

This cross-sectional study examined general animal-rights attitudes among veterinary students and their associations with sociodemographic characteristics. A voluntary classroom survey was conducted among 400 students at Aydın Adnan Menderes University, Türkiye, in May 2026. Students completed a sociodemographic form and the Animal Rights Attitude Scale in Turkish. Following item analysis, two items were excluded, and the resulting 30-item score was analyzed in 354 students with complete scale responses. Female students and pet owners had higher attitude scores in unadjusted comparisons. In the multivariable analysis, which included 352 students with complete outcome and predictor data, sex, class year, and place of residence were associated with attitude scores. Pet ownership was not statistically significant after adjustment, and some findings were sensitive to influential observations. The findings suggest that general animal-rights attitudes vary across student characteristics, but do not establish causal relationships or changes during veterinary education. The scale does not directly measure preferences for specific stray-animal management practices. The single-faculty design and exclusion of incomplete scale responses limit generalizability. Multicenter and longitudinal studies are needed to clarify the relationships observed.

Keywords: animal rights; ethics; cross-sectional study; sociodemographic characteristics; veterinary education; veterinary students

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1. Introduction

Veterinary students' attitudes toward animal rights are relevant to the ethical decisions they will face in professional practice. Veterinary education offers a setting in which students can examine their responsibilities toward animals and consider how those responsibilities relate to animal health and welfare.

The protection of stray animals is one setting in which these questions arise. International guidance on dog population management emphasizes responsible ownership, humane interventions, and consideration of community attitudes [1–5]. Studies of free-roaming animal populations and their management describe variation across settings and differences in the methods used to assess interventions [6–8]. In Türkiye, sheltering, adoption, and public awareness have featured in discussions about the protection of stray animals [9,10]. Related research has examined students' views on animal sentience and animal use [11] and how people respond to stray animals [12]. The Universal Declaration of Animal Rights and Türkiye's Law No. 5199 provide broader ethical and legal context for these discussions [13,14].

Veterinarians have professional responsibilities for animal health and welfare [15]. Previous research has reported differences between veterinary students and students in another faculty in their endorsement of an animal rights perspective [16]. Other studies have explored veterinary students' views on animal welfare and animal rights [17], including research in Türkiye [18]. Studies in different educational settings have also examined related constructs, including attitudes toward animals and perceptions of animal welfare [19–23]. These studies provide a basis for examining how general animal-rights attitudes vary among veterinary students with different sociodemographic characteristics.

This study aimed to assess general attitudes toward animal rights among veterinary students at Aydın Adnan Menderes University and to examine their associations with selected sociodemographic characteristics. Attitudes were measured using the Animal Rights Attitude Scale.

2. Materials and Methods

2.1. Study Population and Sampling

The study population consisted of 685 students enrolled in the Faculty of Veterinary Medicine at Aydın Adnan Menderes University during the 2025–2026 academic year. Recruitment was organized by class year, and data were collected face-to-face in classroom settings in May 2026. All students present during the data collection sessions were informed about the study and invited to participate. No random selection procedure was applied within class years. Participation was voluntary, and 400 students completed the questionnaire, corresponding to participation by approximately 58.4% of enrolled students (400/685).

The sample included 76 first-year students (19.0%), 85 second-year students (21.3%), 78 third-year students (19.5%), 85 fourth-year students (21.3%), and 76 fifth-year students (19.0%). The proportions of enrolled students who participated in each class year were approximately 56% for first-year students (76/136), 62% for second-year students (85/137), 56% for third-year students (78/139), 62% for fourth-year students (85/137), and 56% for fifth-year students (76/136).

No demographic or attitudinal information was collected from nonrespondents; therefore, it was not possible to determine whether they differed systematically from participants. Voluntary participation may have introduced self-selection bias. In addition, collecting data in classroom settings may have introduced perceived social pressure or social desirability bias.

Recruitment used voluntary convenience sampling organized by class year. Although students from all five class years were included, their relatively balanced distribution does not establish that the sample was representative of the faculty's entire student population.

2.2. Data Collection

Sociodemographic data included age, sex (female/male), class year (1st–5th year), maternal education level (non-literate, primary school, middle school, high school, associate degree, bachelor's degree, or postgraduate degree), place of residence (family home, state dormitory, private dormitory, student house, or other), socioeconomic status (low, lower-middle, middle, upper-middle, or high), pet ownership (yes/no), and membership in civil society organizations (yes/no).

Data were collected using an eight-item sociodemographic information form and the 32-item Animal Rights Attitude Scale developed by Çağlar [24]. The scale is a five-point Likert-type instrument, with response options ranging from "strongly disagree" (1) to "strongly agree" (5). Permission to use the scale was obtained from the author prior to the study. The questionnaire was administered in Turkish. The complete English version of the instrument is provided in the Supplementary Material (File S1).

2.3. Ethical Considerations

An informed consent statement was included on the first page of the questionnaire. Before participation, students were informed about the purpose and procedures of the study and that participation was voluntary. Students indicated their consent by choosing to complete the questionnaire after reading this statement. The questionnaire was completed anonymously, no personally identifiable information was collected, and all responses were analyzed collectively.

The study was approved by the Social and Human Sciences Research Ethics Committee of Aydın Adnan Menderes University (Decision No. 32/03; 17 April 2026).

2.4. Data Analysis

Data were analyzed using IBM SPSS Statistics 26.0 and Python (https://www.python.org/, accessed on 10 November 2026). Descriptive statistics included frequencies, percentages, and means ± SEM. Negatively worded items were reverse-coded; Items 4 and 27 were excluded for corrected item–total correlations < 0.30. The retained-item total was reconstructed from the 30 retained items, with higher scores indicating more favorable animal-rights attitudes. Primary scoring required all 30 responses (allowable missing-item count: zero; possible range: 30–150), without imputation or prorating. Cronbach's α and outcome comparisons used 354 complete records. Of the 400 respondents, 354 completed all retained items, 34 missed one item, nine missed two, and one each missed three, four, and five.

Welch *t*-tests and Welch one-way ANOVA compared scores between groups; Cohen's d summarized sex and pet-ownership differences. Multivariable linear regression included sex, class year, maternal education, socioeconomic status, residence, pet ownership, and civil society organization membership as categorical predictors. Excluding two records with missing predictors yielded 352 regression records. Coefficients, HC3 robust standard errors, and 95% confidence intervals were reported. Joint partial F and HC3 Wald F tests evaluated overall categorical effects; R^2 and adjusted R^2 summarized model fit.

Residual-versus-fitted and scale–location plots, Q–Q assessment, the Breusch–Pagan and RESET tests, and influence diagnostics assessed regression assumptions; multicollinearity checks followed established guidance [25]. HC3 inference addressed heteroskedasticity. To distinguish sample restriction from score construction, sensitivity analyses compared the

previously stored total with the reconstructed retained-item scores in all-respondent and complete-response samples (Section 3.5; Supplementary Tables S1 and S2). Reconstructed available-item sums were included only as diagnostic comparisons because participants with missing responses do not share a common maximum score. Tests were two-sided at $p < 0.05$. No global multiplicity adjustment was applied; all individual regression category contrasts were exploratory. Custom Python code was used for scoring and analysis. The study was not preregistered.

3. Results

3.1. Participant Characteristics

A total of 400 veterinary students participated in the study. Their mean age was 21.92 ± 0.15 years (SEM), and 63.5% were female. Most participants reported middle socioeconomic status (63.2%). State dormitories (43.0%) and student houses (37.5%) were the most common places of residence. Overall, 53.0% owned a pet and 19.5% were members of civil society organizations. Participant characteristics are summarized in Table 1.

Table 1. Demographic and Social Characteristics of the Participants.

Variable	Category	*n*	%	Mean ± SEM
Age, years	Female	254	63.5	21.93 ± 0.20
	Male	146	36.5	21.90 ± 0.21
	Total	400	100.0	21.92 ± 0.15
Class year	1st	76	19.0	—
	2nd	85	21.3	—
	3rd	78	19.5	—
	4th	85	21.3	—
	5th	76	19.0	—
	Total	400	100.0	—
Maternal education level	Non-literate	19	4.8	—
	Primary school	83	20.8	—
	Middle school	61	15.3	—
	High school	109	27.3	—
	Associate degree	33	8.3	—
	Bachelor's degree	78	19.5	—
	Postgraduate degree	16	4.0	—
	Total	399	99.8	—
Socioeconomic status	Low	7	1.8	—
	Lower-middle	58	14.5	—
	Middle	253	63.2	—
	Upper-middle	76	19.0	—
	High	5	1.3	—
	Total	399	99.8	—

Table 1. *Cont.*

Variable	Category	*n*	%	Mean ± SEM
Place of residence	Family home	25	6.3	—
	State dormitory	172	43.0	—
	Private dormitory	46	11.5	—
	Student house	150	37.5	—
	Other	7	1.8	—
	Total	400	100.0	—
Pet ownership	Yes	212	53.0	—
	No	188	47.0	—
	Total	400	100.0	—
Membership in civil society organizations	Yes	78	19.5	—
	No	322	80.5	—
	Total	400	100.0	—

Note: SEM, standard error of the mean. Percentages are based on the full sample ($n = 400$) and may not sum to 100% due to missing responses and rounding. Maternal education and socioeconomic status each had one missing response ($n = 399$).

3.2. Scale Scores and Reliability

The 354 participants with complete responses to all 30 retained items had a mean score of 123.90 ± 0.80 (SEM; observed range, 79–146). Cronbach's α was 0.881. Forty-six participants (11.5%) had at least one missing retained item and were excluded from the primary outcome analyses. The distribution of missing-item counts is reported in Section 2.4.

3.3. Bivariate Comparisons of Animal Rights Attitude Scale Scores

Female students scored higher than male students (mean difference, 10.12 points; 95% CI, 6.91–13.32; $p < 0.001$; Cohen's d = 0.71). Pet owners also scored higher than non-owners (mean difference, 5.33 points; 95% CI, 2.23–8.43; $p < 0.001$; Cohen's d = 0.36). Welch ANOVA indicated differences across class years ($p = 0.002$) and places of residence ($p < 0.001$). There was no statistically significant evidence of differences by maternal education ($p = 0.069$), socioeconomic status ($p = 0.252$), or civil society organization membership ($p = 0.563$). Group summaries and overall comparisons are presented in Table 2.

Table 2. Thirty-item scores in complete-response participants and Welch comparisons.

Variable	Category	*n*	Mean ± SEM	Overall *p*
Sex	Female	221	127.71 ± 0.88	<0.001
	Male	133	117.59 ± 1.37	
Class year	1	67	120.27 ± 2.30	0.002
	2	71	128.49 ± 1.29	
	3	71	125.85 ± 1.66	
	4	75	120.27 ± 1.87	
	5	70	124.66 ± 1.48	
Maternal education	Non-literate	15	121.07 ± 3.45	0.069

Table 2. *Cont.*

Variable	Category	*n*	Mean ± SEM	Overall *p*
	Primary school	71	120.15 ± 1.83	
	Middle school	51	120.41 ± 2.30	
	High school	99	125.82 ± 1.40	
	Associate degree	29	124.76 ± 2.76	
	Bachelor's degree	73	126.60 ± 1.72	
	Postgraduate	15	127.87 ± 3.61	
Socioeconomic status	Low	6	130.33 ± 4.14	0.252
	Lower-middle	52	120.17 ± 2.10	
	Middle	221	125.07 ± 0.96	
	Upper-middle	71	122.72 ± 2.00	
	High	3	121.33 ± 10.09	
Residence	Family home	21	134.86 ± 1.58	<0.001
	State dormitory	146	122.55 ± 1.26	
	Private dormitory	42	127.71 ± 2.14	
	Student house	140	122.10 ± 1.27	
	Other	5	136.00 ± 5.03	
Pet ownership	Yes	188	126.40 ± 1.06	<0.001
	No	166	121.07 ± 1.17	
Civil society membership	Yes	68	122.91 ± 1.93	0.563
	No	286	124.14 ± 0.87	

Note: Values are mean ± SEM. The main outcome sample is $n = 354$; maternal education and socioeconomic status each have $n = 353$ owing to one missing predictor response. Overall *p*-values use Welch *t*-tests for two-group predictors and Welch ANOVA for multi-category predictors. Cohen's d = 0.71 for sex and 0.36 for pet ownership. No multiplicity adjustment was applied. Small subgroups require caution.

3.4. Multivariable Linear Regression Analysis

The multivariable model included 352 participants and explained 22.9% of the variance in scale scores ($R^2 = 0.229$; adjusted $R^2 = 0.180$). With HC3 robust inference, female students had higher adjusted scores than male students (B = 8.441; 95% CI, 4.854–12.028; $p < 0.001$). Joint tests supported associations with class year ($p = 0.004$) and residence ($p < 0.001$), but not maternal education, socioeconomic status, or civil society organization membership. The adjusted estimate for pet ownership was positive, but its confidence interval included zero (B = 2.973; 95% CI, −0.173 to 6.120; $p = 0.064$). Table 3 presents the regression coefficients, and Table 4 presents the omnibus tests for each categorical predictor.

Exploratory category contrasts indicated higher scores among second- and fifth-year students than first-year students ($p = 0.007$ and $p = 0.040$, respectively). Students living with their families scored higher than those living in state dormitories (B = 9.919; 95% CI, 5.289–14.550; $p < 0.001$). The contrast for other residence arrangements was also significant ($p = 0.005$), although this category contained only five participants in the outcome sample. Category-specific contrasts were not adjusted for multiple comparisons.

Table 3. Complete-response multivariable regression with HC3 robust inference.

Predictor and Reference	B	HC3 SE	95% HC3 CI	*p*
Intercept	114.750	3.141	108.572 to 120.929	<0.001
Sex: Female vs. Male	8.441	1.824	4.854 to 12.028	<0.001
Class year: 2nd vs. 1st year	7.189	2.625	2.025 to 12.353	0.007
Class year: 3 vs. 1st year	5.611	2.898	−0.090 to 11.312	0.054
Class year: 4 vs. 1st year	0.280	2.965	−5.554 to 6.113	0.925
Class year: 5 vs. 1st year	6.099	2.954	0.287 to 11.911	0.040
Maternal education: Non-literate vs. High school	−5.021	3.429	−11.765 to 1.724	0.144
Maternal education: Primary school vs. High school	−4.031	2.387	−8.726 to 0.664	0.092
Maternal education: Middle school vs. High school	−3.245	2.799	−8.751 to 2.262	0.247
Maternal education: Associate degree vs. High school	−1.954	3.229	−8.307 to 4.398	0.545
Maternal education: Bachelor's degree vs. High school	−0.189	2.051	−4.224 to 3.845	0.927
Maternal education: Postgraduate vs. High school	−0.140	3.422	−6.873 to 6.592	0.967
Socioeconomic status: Low vs. Middle	6.533	5.324	−3.939 to 17.006	0.221
Socioeconomic status: Lower-middle vs. Middle	−1.574	2.160	−5.822 to 2.675	0.467
Socioeconomic status: Upper-middle vs. Middle	−2.518	2.055	−6.560 to 1.525	0.221
Socioeconomic status: High vs. Middle	−1.257	11.167	−23.224 to 20.710	0.910
Residence: Family home vs. State dormitory	9.919	2.354	5.289 to 14.550	<0.001
Residence: Private dormitory vs. State dormitory	3.525	2.458	−1.310 to 8.360	0.152
Residence: Student house vs. State dormitory	−0.682	1.959	−4.536 to 3.172	0.728
Residence: Other vs. State dormitory	12.490	4.467	3.702 to 21.278	0.005
Pet ownership: Yes vs. No	2.973	1.600	−0.173 to 6.120	0.064
Civil society membership: Yes vs. No	−0.652	2.114	−4.810 to 3.506	0.758

Note: $n = 352$; B, unstandardized coefficient; SE, HC3 heteroskedasticity-robust standard error; CI, t-based robust confidence interval. The model includes all seven categorical predictors simultaneously. Reference categories are listed in the predictor labels. $R^2 = 0.229$; adjusted $R^2 = 0.180$; conventional $F(21, 330) = 4.664$, $p < 0.001$. Category contrasts are exploratory and uncorrected for multiplicity. Diagnostic assessment indicated heteroskedasticity (Breusch–Pagan $p < 0.001$), tail departures from normality, and some curvature in the residual trend. HC3 robust standard errors were therefore used for inference. The RESET test was not significant ($p = 0.129$), although this does not establish correct model specification. Thirteen observations exceeded the Cook's distance threshold of 4/352; the maximum Cook's distance was 0.065 and maximum leverage was 0.387. VIF values ranged from 1.060 to 1.961. Diagnostic plots are presented in Figure S1.

Table 4. Joint tests of categorical predictors in the complete-response model.

Factor	df	Partial F	*p*	HC3 F	HC3 *p*
Sex	1	27.872	<0.001	21.428	<0.001
Class year	4	4.218	0.002	3.980	0.004
Maternal education	6	0.799	0.571	0.835	0.543
Socioeconomic status	4	0.848	0.496	0.935	0.443
Residence	4	3.844	0.005	7.013	<0.001
Pet ownership	1	3.774	0.053	3.455	0.064
Civil society membership	1	0.118	0.731	0.095	0.758

Note: Denominator degrees of freedom = 330. Omnibus tests evaluate all indicator coefficients for each factor jointly. Category-specific contrasts in Table 3 are exploratory.

3.5. Scoring and Influence Sensitivity Analyses

Supplementary Table S1 distinguishes the full survey sample ($n = 400$), the sample with complete responses to all 30 retained items ($n = 354$), and the primary regression sample with complete outcome and predictor data ($n = 352$). Supplementary Table S2 reports the omnibus tests across the scoring and influence sensitivity analyses. The previously stored total, the reconstructed available-item sum, and the reconstructed complete 30-item score are presented separately. Sex comparisons yielded $p < 0.001$ in both samples under both score constructions. For the previously stored total, the pet-ownership Student *t*-test yielded $p = 0.025$ in the 400-participant sample and $p = 0.107$ in the 354-participant sample; the corresponding regression R^2 values were 0.091 and 0.106. For the reconstructed complete 30-item outcome, the Welch pet-ownership comparison yielded $p < 0.001$, and the adjusted HC3 contrast yielded $p = 0.064$. The available-item sum was diagnostic only; primary conclusions were based on the common-metric complete 30-item score. Differences between the earlier and revised analyses reflect changes in score construction, sample inclusion, and inferential procedures and cannot be attributed to sample restriction alone.

After excluding the 13 observations flagged by Cook's distance, the exploratory model included 339 participants. HC3 joint tests continued to support sex, class year, and residence. Results for pet ownership ($p = 0.030$), socioeconomic status ($p = 0.032$), and the private-dormitory contrast ($p = 0.006$, compared with $p = 0.152$ in the primary model) were sensitive to these exclusions. All eligible observations were retained in the primary analysis.

4. Discussion

In the present study, veterinary students' general attitudes toward animal rights were evaluated in relation to several sociodemographic characteristics. The higher scores observed among female students are consistent with the general pattern reported in previous studies. Colombo et al. [26] reported higher levels of empathy toward animals among female veterinary students. Similarly, Peek et al. [27] reported greater support for animal-rights advocacy among women and discussed this finding in relation to gender socialization and orientations toward care and protection. Phillips et al. [28], in a multinational study, also reported more favorable attitudes among female students toward the use and protection of animals. Kruse [29] likewise found greater support for animal rights among women.

The persistence of the sex-related association after adjustment suggests that the difference was not fully explained by the other measured sociodemographic characteristics. The explanations discussed in previous research are relevant to understanding this pattern, although empathy, gender ideology, and preferred areas of veterinary practice were not assessed here. Moreover, the cited studies examined related outcomes rather than an

identical measure. They support a comparison of the general pattern, rather than a direct comparison of score differences.

Taken together, the findings do not provide consistent evidence of an independent association between pet ownership and animal-rights attitudes. Previous studies have also reported inconsistent findings. Robbins et al. [30] found no significant association between childhood pet ownership and attitudes toward animals among first-year veterinary students, whereas Busch et al. [31] reported an association between pet ownership and values related to animal protection in the German adult population. The studies differ in their populations and in whether childhood or current ownership was assessed. Duration of ownership, animal species, frequency of contact, and the quality of the human–animal relationship were not measured in the present study. These characteristics could help clarify why ownership is associated with attitudes in some settings but not others. Students with more favorable attitudes may also be more likely to own a pet, so the direction of the relationship remains uncertain.

The differences between class years do not demonstrate a progressive change in attitudes during veterinary education. Although second- and fifth-year students had higher adjusted scores than first-year students in exploratory contrasts, the pattern was not consistent across successive years. Davitkov et al. [21] reported differences in some views concerning animals when comparing first- and final-year veterinary students. Such comparisons may identify differences between cohorts, but following the same students over time would be more appropriate for evaluating changes during veterinary education.

The findings for maternal education and socioeconomic status should be considered in relation to the measures used. Jerolmack [32] reported greater support for animal rights among younger and less-educated respondents in a general population sample, while income was not a significant predictor. That study assessed respondents' own education and income, whereas the present study assessed maternal education and students' self-reported socioeconomic categories. The findings are therefore not directly comparable. Small socioeconomic subgroups and the sensitivity of the adjusted socioeconomic result to influential observations further limit interpretation; the absence of statistical significance in the primary analyses does not establish that these characteristics are unrelated to attitudes.

For residence, the exploratory family-home contrast identified a difference between student groups but did not explain why their attitudes differed. The study did not assess features of family life or the residential environment that could account for this association. The private-dormitory contrast was not supported in the primary robust model and changed in the influence sensitivity analysis. Accordingly, the residence findings do not establish that a particular living arrangement promotes more favorable animal-rights attitudes.

Membership in civil society organizations was assessed only as a yes/no variable. The organization's field of activity, whether it was related to animal protection, duration of membership, and level of participation were not recorded. Consequently, this measure may not have been sufficiently specific to identify an association between participation in animal-related activities and attitudes toward animal rights. The finding should not be taken to mean that the nature or extent of organizational involvement is unimportant.

The conceptual focus of the present study should also be considered when comparing its findings with the broader literature. Paul and Podberscek [33] examined veterinary students' attitudes toward animal welfare, while Mijares et al. [34] evaluated animal-welfare perceptions and education among animal-science students. Animal rights and animal welfare are related but distinct constructs. These studies therefore provide educational context rather than directly comparable measurements of the outcome assessed here. Discussing both animal rights and animal welfare in veterinary ethics education could help

students critically evaluate different ethical frameworks and consider their implications for professional decision-making.

The inclusion of 400 students from all five class years allowed several sociodemographic characteristics to be examined within the same faculty. Nevertheless, the single-institution, cross-sectional design limits generalizability and does not establish causal relationships. Voluntary classroom participation may have introduced self-selection, perceived social pressure, or socially desirable responding. No information was collected from nonrespondents. Restricting the primary outcome analyses to 354 complete responses may also have introduced selection bias if completeness was related to attitudes or other characteristics; random missingness was not established, and no imputation or prorating was used. The scale measures general attitudes toward animal rights and does not assess preferences for specific stray-animal management practices.

The exclusion of two items produced a sample-specific 30-item score. High internal consistency does not establish its construct validity or equivalence to the original instrument. The scale measures self-reported attitudes rather than behavior, and strongly worded items may be particularly susceptible to socially desirable responses. Small subgroups reduced precision. HC3 robust inference addressed heteroskedasticity but does not correct possible misspecification of the conditional mean or remove sensitivity to influential observations. Individual category contrasts also remain exploratory because no global multiplicity adjustment was applied.

The model accounted for only part of the variability in attitudes. Empathy, previous animal-related education, childhood experiences with animals, the frequency and quality of animal contact, and intended field of veterinary practice were not assessed. Examining these characteristics may provide a fuller understanding of students' attitudes than sociodemographic information alone. Multicenter studies involving veterinary faculties from different regions of Türkiye and cross-cultural comparisons [35] could assess the generalizability of the findings. Longitudinal studies could clarify how attitudes develop during veterinary education. The contribution of the present study is to identify associations within one faculty, rather than to establish their causes or students' positions on specific stray-animal management policies.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/vetsci13111221/s1, Supplementary File S1: Questionnaire Form; Supplementary Statistical Analyses: Tables S1 and S2 and Figure S1.

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