Título: *Study of the perception of animal abuse in a population of adolescents, students of the Faculty of Veterinary Medicine and professionals in the field*

Estudiante:

Laura Estévez Pérez

Tutor:

Manuel Luis Zumbado Peña

Tutor Colaborador:

Luis Alberto Henríquez Hernández

Curso Académico:
2022-2023

UNIVERSIDAD DE LAS PALMAS DE GRAN CANARIA
Facultad de Veterinaria

INDEX

1. HYPOTHESIS

1. Animal welfare is inherent in the society in which each individual lives and is influenced by the environment and upbringing, especially in adolescence, a time when the individual's ethical principles take hold. Knowledge of the perception of animal welfare in this group could help to improve it in adulthood.

2. The role of the veterinarian in animal welfare is important and should be promoted from the veterinary school stage. Understanding the perception of animal welfare among veterinary students could contribute to improving future interventions in cases of animal abuse.

3. Different professional groups work for animal welfare, many of them unknown to the general public. Knowing what they do and how they operate can help to improve the perception of animal welfare in society.

2. OBJECTIVES

1. To find out the perception of animal welfare among adolescents, studying the influence of the main socio-demographic factors that may condition it.

2. To find out the perception of animal welfare among veterinary students, and to study the main socio-demographic factors that influence the assessment of animal welfare.

3. To present the main activities and experiences of veterinarians specialized in animal welfare and law enforcement related to legal interventions of animal abuse.

3. INTRODUCTION

According to the World Organization for Animal Health (OMSA, abbreviation that corresponds to its French acronym), animal welfare is defined as follows in the Terrestrial Animal Health Code [1]:

"*An animal is in good welfare condition if it is healthy, comfortable, well fed, safe, able to express innate forms of behavior and if it does not suffer from unpleasant sensations of pain, fear or distress*".

The relevance of animal welfare depends on society's tolerance of abuse and mistreatment, which is rooted in socio-cultural factors. This explains why animal welfare is more important in northern European countries than in Mediterranean

countries [2]. Historically, Spain is a country with a high tolerance for animal abuse. In fact, different forms of mistreatment are even legal and have broad social support, as is the case of bullfighting and cockfighting [3]. It is estimated that in Spain today there are around 3,000 different types of popular festivities in which animals are used and mistreated. It mainly includes cattle (mainly bulls, small ruminants (lambs), horses and different species of birds (ducks) [4]. This translates into other forms of animal abuse, including intentional poisoning (of both domestic animals and wildlife) and animal abandonment [2, 5, 6]. Spain leads Europe in terms of pet abandonment. Without official data, according to private foundations, 286,000 dogs and cats arrived at animal shelters in our country [7]. If we take into account that there is no data from all the shelters and that there are animals that, once abandoned, live on the streets (cats, above all), we can assume that this number is much higher. According to the European Society of Dog and Animal Welfare (ESDAW), that number could rise to 800,000 (**Table 1**).

The competent authority and the Spanish Government are aware of this situation, which they have tried to remedy with the approval of the new Animal Welfare Law, which has not yet been passed [8]. During the passage of this new law, it has become clear that there is social polarization on this issue, with very conservative sectors that are reluctant to accept this new law.

According to the ESDAW, it is estimated that there are about one hundred million abandoned pets in Europe [9]. Canary Islands (and the Balearic Islands) are Spanish regions where the rate of abandoned animals is higher and, is among the regions with the highest rates of pet abandonment in Europe. The Canary Islands territory is specifically named by the ESDAW, which reports a total of 10,000 dogs (not including cats) abandoned in this region (**Table 1**). For its part, according to the data provided by the Centre, the Settle Island closed the year 2022 with a total entry registration of 1,370 dogs and 635 cats; although it does not represent the total abandonment of the island, we can guess under which figures it is.

Table 1. Stray animals by country - Europe

Country	Dogs	Cats	Others
Albania	150,000		
Andorra	5,000		
Armenia	30,000		
Azerbaijan	150,000		
Austria (EU)	NA		
Belgium (EU)	1,000		
Belarus	500,000		
Bosnia & Herzegovina	200,000		

Bulgaria (EU)	300,000		
Croatia	150,000		
Cyprus (EU)	40,000		
Czech Republic (EU)	NA		
Denmark (EU)	NA		
Greenland (Denmark)	NA		
Estonia (EU)	10,000		
Finland (Eu)	NA		
France (EU)	20,000		
Georgia	150,000		
Germany (EU)	NA		
Greece (EU)	500,000		
Hungary (EU)	200,000		
Iceland	NA		
Ireland (EU)	100,000		10,000 horses
Italy (EU)	600,000	800,000	
Kazakhstan	300,000		
Kosovo	100,000		
Latvia (EU)	30,000		
Liechtenstein	NA		
Lithuania (EU)	40,000		
Luxembourg (EU)	NA		
Macedonia (Republic of)	150,000		
Malta (Eu)	10,000		
Moldova	200,000		
Monaco	NA		
Montenegro	100,000		
Netherlands (EU)	8000	25,000	
Norway	NA		
Poland (EU)	250,000		
Portugal (EU)	250,000	250,000	
Romania (EU)	2,000,000		50,000 horses/donkeys
Russia	4,000,000		
San Marino	1,000		
Serbia	75,000		
Slovakia (EU)	100,000		
Slovenia (EU)	40,000		

Spain (EU)	800,000		
Canary Islands (Spain)	10,000		
Sweden (EU)		130,000	
Switzerland	NA		
Turkey	2,000,000		
Ukraine	1,000,000		
United Kingdom (EU)	125,176	200,000	4,000 horses
Vatican City State	NA		
Worldwide	600,000,000		

Abbreviations: EU, European Union; NA, not available.
Source: https://www.esdaw.eu/stray-animals-by-country.html

Similarly, the incidence of poisoning in the Canary Islands is currently one of the highest reported at any region of the European Union [6]. Among the substances described, pesticides constitute the vast majority for poisoning cases in domestic animals (dogs and cats). Such a profile of toxicants suggests a high compatibility with intentionality, which is directly related to their high prevalence and whose use in agriculture would be illegal throughout the EU. There must be certain social and demographic factors that explain these data.

The Canary Islands have one of the highest levels of social problems in Spain. With an unemployment rate of 14.6% [10], which corresponds to a total of 202,520 people [11], is one of the autonomous communities with the highest unemployment rates [12]. According to data from the National Statistics Institute referring to the year 2021 [13], the Canary Islands had the lowest Gross Disposable Household Income, with 12,410 euros per inhabitant (21.5% lower than the national average). Similarly, and for the third consecutive year, the rate of divorces and marriage annulments keeps the Canary Islands in first place nationally, with a total figure of 4,402 divorces per 1,000 inhabitants in 2021, according to data from the statistics service of the General Council of the Judiciary (2022). Moreover, the school failure and dropout rates, which contribute to the future precariousness of the Canary population, is one of the highest among the Spanish Secondary School, 11.7% of people between eighteen and twenty-four years old, dropped out of school in 2022 [14]. By sex, the early school drop-out rate shows an uneven evolution, with the dropout rate for the male population being 17%, compared to 6.1% for the female population. This means that, in the islands, the drop-out rate for males is almost three times higher than for females according to the Ministry of Education and Vocational Training (2021).

In recent years, the country's demographic pyramid has become asymmetrical in favour of the over-65 age group, whose ageing rate is gradually increasing each year and where births have been at historic lows since 2020 [15]. On the one hand, there are currently 4.3 million children under the age of twelve [16] compared to 9.3 million dogs [17]. Continuing along the same lines, the ageing index for the Canary Islands is illustrated by the difference between births and

deaths registered in 2021: 12,732 births compared to 17,149 deaths [18, 19]. Thus, Spain as an ageing country with more pets than children [15, 17]. In fact, literature describes that as the age of the population increases, so does their need for companionship [20], phenomenon which is positively correlated with population ageing, especially in Canary Islands, where the official census of animals is 253,126 among dogs, cats, equines and other pets for the actual year [21]. Dogs are the favorite pet of the Canarian population, where a total of 220,492 dogs are registered, which represents 87% of the total number of animals, collected by the Canary Islands Animal Identification Register, without taking into account those animals that do not have a microchip.

This cocktail of social imbalances leads us to ask ourselves whether animal welfare has a place in the priorities of the Canarian population or whether, on the contrary, animal abuse is another of the many components inherited from generation to generation among the population of the Canarian Archipelago.

The present study is limited to the island of Gran Canaria, where a field study, based on surveys, has been carried out among (i) adolescents aged 14-18 years, (ii) veterinary students at the University of Las Palmas de Gran Canaria (ULPGC), and (iii) professionals involved in animal welfare management. The aim of this study was to find out the socio-demographic factors in relation to animal welfare in cohorts of adolescents and veterinary students (highlighting some of the problems rooted in younger generations which – hypothetically – could have their origin in past generations; and to find out about the field work carried out by animal welfare professionals. Given that the social, demographic, and economic situation is similar throughout the archipelago (ISTAC, 2022), the data presented in this Final Degree Project could be considered representative of our autonomous community.

4. MATERIAL AND METHODS

4.1. Material

4.1.1. Assessment of animal welfare in adolescents

To assess the perception of adolescents in relation to animal abuse, a modified model of the survey developed by Monzalvo & Torres (2021) [22] (ANNEX I) was distributed in the guidance departments of the secondary schools of Valleseco and Teror during the period from September to December and the data was collected in Excel.

4.1.2. Perception of animal welfare among students from the Faculty of Veterinary Medicine

To assess the perception of animal welfare on the Faculty of Veterinary Medicine, an 18-question questionnaire was developed using the Google Surveys platform, from which it was disseminated from the first to the last courses and supported with QR codes placed in the faculty. The survey was active during the month of November, and the data was collected in Excel**.**

4.1.3. Assessment of animal abuse from a professional's point of view

To get the point of view of the professionals who are on the front line of animal abuse complaints, a series of questions were asked to find out what the current situation is with regard to this problem. Interviews were arranged in person and lasted on average one hour.

4.2. Statistical analyses

Descriptive analyses were conducted for all variables. Means and standard deviation (SD) were calculated for continuous variables. Proportions were calculated for categorical variables.

The normality of the data was tested using the Kolmogorov-Smirnov test. Comparisons between groups were performed using parametric (student t-test or ANOVA test) or non-parametric test (Kruskal-Wallis or Mann-Whitney U test). Differences in the categorical variables were tested by the chi-squared test. We used PASW Statistics v 19.0 (SPSS Inc., Chicago, IL, USA) to manage the database of the study and to perform statistical analyses. Probability levels of <0.05 (two tailed) were considered statistically significant.

5. RESULTS

5.1. Perception of animal welfare among adolescents

A total of 302 adolescents between 14 and 17 years old were interviewed about their perception of animal abuse. The individuals belonged to the secondary and high schools from CEO Rey Juan Carlos I and IES Teror, located in the municipalities of Teror and Valleseco, on the island of Gran Canaria (Canary Islands, Spain). The main socio-demographic characteristics are summarized in Table 2. Briefly, 162 individuals (53.6 %) were secondary school students, and 164 subjects (54.3 %) were male. Most of the series lived in a rural environment (90.7 %), in a family with married parents (72.8 %) and siblings (80.8 %). Most of them were involved in after-school activities (67.5 %), with sports being the preferred activity (**Table 2**). Finally, most individuals lived with a pet (75.5 %), with dogs being the predominant species (72.8 %). A total of 53 (17.5 %) and 66 (21.9 %) individuals had a relative who was a hunter or fisherman.

Table 2. Demographic characteristics of the study population, in the whole series and segmented according to level of education.

	Whole Series	Secondary School			High school		P value#
		3rd Degree (n = 88)	3rd Degree* (n = 18)	4th Degree (n = 56)	1stegree (n = 65)	2nd Degree (n = 75)	
Variable	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
Gender							0.467
Male	164 (54.3)	49 (55.7)	11 (61.1)	26 (46.4)	40 (61.5)	38 (50.7)	
Female	138 (45.7)	39 (44.3)	7 (38.9)	30 (53.6)	25 (38.5)	37 (49.3)	
Age (mean ± SD)	15.5 ± 1.2	14.2 ± 0.5	14.8 ± 0.4	15.0 ± 0.6	16.0 ± 0.5	17.0 ± 0.3	< 0.001†
Level of education							—
Secundary school	162 (53.6)	NA	NA	NA	NA	NA	
High school	140 (46.4)	NA	NA	NA	NA	NA	
Habitat							0.242
Rural	274 (90.7)	79 (89.8)	18 (100)	54 (96.4)	57 (87.7)	66 (88.0)	
Urban	92 (9.3)	9 (10.2)	0	2 (3.6)	8 (12.3)	9 (12.0)	
Family situation							0.951
Married parents	220 (72.8)	63 (71.6)	13 (72.2)	40 (71.4)	47 (72.3)	57 (76.0)	
Divorced parents	64 (21.2)	18 (20.5)	3 (16.7)	13 (23.2)	15 (23.1)	15 (20.0)	
Others	18 (6.0)	7 (8.0)	2 (11.1)	3 (5.4)	3 (4.6)	3 (4.0)	
Siblings (yes)	244 (80.8)	71 (80.7)	16 (88.9)	45 (80.4)	52 (80.0)	60 (80.0)	0.935
Afterschool activities (yes)	204 (67.5)	60 (68.2)	5 (27.8)	38 (67.9)	46 (70.8)	55 (73.3)	0.006
Type of activity**							0.039
Intellectual	80 (39.2)	28 (46.7)	2 (40.0)	18 (47.4)	9 (19.6)	23 (41.8)	
Sports	124 (60.8)	32 (53.3)	3 (60.0)	20 (52.6)	37 (80.4)	32 (58.2)	
Pets (yes)	228 (75.5)	73 (83.0)	15 (83.3)	42 (75.0)	47 (72.3)	51 (68.0)	0.208

Number of pets							0.807
1	83 (36.4)	27 (37.0)	5 (33.3)	13 (31.0)	19 (40.4)	19 (37.3)	
2	49 (21.5)	18 (24.7)	2 (13.3)	9 (21.4)	11 (23.4)	9 (17.6)	
3-5	63 (27.6)	22 (30.1)	4 (26.7)	12 (28.6)	12 (25.5)	13 (25.5)	
≥ *6*	33 (14.5)	6 (8.2)	4 (26.7)	8 (19.0)	5 (10.6)	10 (19.6)	
Number of species							0.058
1	134 (58.8)	44 (60.3)	8 (53.3)	22 (52.4)	29 (61.7)	31 (60.8)	
2	56 (24.6)	20 (27.4)	7 (46.7)	14 (33.3)	10 (21.3)	12 (23.5)	
≥ *3*	38 (16.7)	9 (12.3)	0	6 (14.3)	8 (17.0)	8 (15.7)	
Cats (yes)	82 (36.0)	21 (28.8)	8 (53.3)	17 (40.5)	20 (42.6)	16 (31.4)	0.255
Dogs (yes)	166 (72.8)	49 (67.1)	12 (80.0)	30 (71.4)	35 (74.5)	40 (78.4)	0.644
Family hunter (yes)	53 (17.5)	13 (14.8)	3 (16.7)	6 (10.7)	19 (29.2)	12 (16.0)	0.074
Family fisherman (yes)	66 (21.9)	22 (25.0)	4 (22.2)	9 (16.1)	14 (21.5)	17 (22.7)	0.801

Abbreviations: SD, standard deviation; NA, not applicable.
*Subgroup of students with adapted syllabus mainly due to learning difficulty.
**Intellectual afterschool activities include art performance and support classes; sports include football, swimming, athletics, gymnastics, and horse riding, among others.
#Chi square test.
†Kruskal-Wallis test.

In order to find out the influence of age on the perception of animal welfare, the series was segmented according to the school year the individual was attending at the time of the survey. No significant differences were observed in the distribution of the main socio-demographic variables in relation to this segmentation. A significant difference was only observed in relation to after-school activities, possibly due to the low percentage of third-year secondary school students with adapted syllabus (27.8 %) compared to the rest of the groups, which showed percentages above 65 % (**Table 3**). This group of students is characterized by learning difficulties, which explains why they spend more time studying after school and less time on other leisure activities. As expected, the distribution of age in relation to academic year showed a significant difference.

Table 3 shows the results of the surveys - on a scale of 1 to 5, where 1 was strongly disagrees and 5 was strongly agrees -, both for the whole series and in relation to the segmentation by academic year. Of the total of 26 questions, 7 showed a significantly different distribution of responses between groups: Q3 (Birds should be kept in cages so that people can admire them; $P = 0.004$), Q4 (If I see that a friend or family member likes to hurt animals, I reprimand them; $P = 0.029$), Q14 (If I couldn't look after my pet, I would give it up for adoption; $P = 0.009$), Q15 (Street animals are a nuisance and give a bad image to my city; $P < 0.001$), Q17 (Animal fights are fun; $P = 0.023$), Q18 (I would like to have classes on animal care in my high school; $P = 0.043$), and Q21 (At home they teach who is in charge by hitting my pet; $P = 0.002$).

Table 3. Distribution (mean ± standard deviation - SD -) of the variables of the animal welfare scale in the whole population and segmented by academic year.

	Whole series	**Secondary School**			**High School**		***P* value***
		3rd Degree (n = 88)	3rd Degree* (n = 18)	4th Degree (n = 56)	1st Degree (n = 65)	2nd Degree (n = 75)	
Variable†	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	
Q1	1.05 ± 0.3	1.08 ± 0.3	1.00 ± 0.0	1.05 ± 0.3	1.02 ± 0.1	1.04 ± 0.2	0.532
Q2	1.12 ± 0.5	1.14 ± 0.6	1.06 ± 0.2	1.18 ± 0.7	1.17 ± 0.6	1.01 ± 0.1	0.294
Q3	1.67 ± 0.8	1.86 ± 1.0	1.67 ± 0.8	1.59 ± 0.7	1.80 ± 0.8	1.40 ± 0.7	**0.004**
Q4	4.25 ± 1.3	4.08 ± 1.5	3.72 ± 1.7	4.57 ± 0.9	4.11 ± 1.4	4.48 ± 1.2	**0.029**
Q5	4.73 ± 0.6	4.67 ± 0.7	4.67 ± 1.0	4.80 ± 0.5	4.74 ± 0.5	4.75 ± 0.6	0.765
Q6	4.84 ± 0.5	4.81 ± 0.6	4.94 ± 0.2	4.88 ± 0.5	4.77 ± 0.5	4.89 ± 0.3	0.397
Q7	4.25 ± 0.9	4.30 ± 0.9	4.22 ± 0.8	4.34 ± 0.9	4.22 ± 0.9	4.19 ± 0.9	0.866
Q8	4.28 ± 0.9	4.30 ± 0.9	4.22 ± 1.1	4.36 ± 0.8	4.23 ± 1.0	4.28 ± 0.8	0.954
Q9	4.67 ± 0.8	4.51 ± 0.9	4.78 ± 0.5	4.79 ± 0.7	4.63 ± 0.8	4.76 ± 0.5	0.150
Q10	1.49 ± 0.8	1.56 ± 1.0	1.39 ± 0.6	1.27 ± 0.5	1.58 ± 0.8	1.53 ± 0.9	0.217
Q11	1.66 ± 1.0	1.68 ± 1.0	1.50 ± 0.9	1.64 ± 1.1	1.68 ± 1.0	1.67 ± 0.9	0.967
Q12	1.71 ± 1.0	1.73 ± 1.1	1.83 ± 1.3	1.61 ± 0.9	1.89 ± 1.2	1.59 ± 0.9	0.422
Q13	4.19 ± 1.0	4.32 ± 0.9	4.06 ± 0.9	4.32 ± 0.8	4.00 ± 1.2	4.13 ± 1.0	0.231
Q14	4.11 ± 1.1	3.90 ± 1.3	4.00 ± 1.3	4.14 ± 1.1	3.97 ± 1.1	4.49 ± 0.7	**0.009**
Q15	1.70 ± 1.0	1.47 ± 0.8	1.50 ± 0.9	1.45 ± 0.8	2.06 ± 1.2	1.91 ± 1.1	**< 0.001**

Q16	3.80 ± 1.3	4.03 ± 1.2	3.44 ± 1.2	3.66 ± 1.4	3.65 ± 1.3	3.85 ± 1.2	0.193
Q17	1.58 ± 1.1	1.45 ± 1.0	1.33 ± 1.0	1.66 ± 1.2	1.94 ± 1.3	1.40 ± 0.9	**0.023**
Q18	3.69 ± 1.2	3.91 ± 1.2	3.83 ± 1.2	3.82 ± 1.2	3.35 ± 1.1	3.59 ± 1.1	**0.043**
Q19	3.00 ± 1.0	3.16 ± 1.1	3.06 ± 1.1	2.89 ± 1.0	2.97 ± 0.9	2.92 ± 1.0	0.500
Q20	1.91 ± 1.1	1.85 ± 1.1	1.89 ± 1.2	1.84 ± 1.1	2.02 ± 1.1	1.95 ± 1.1	0.883
Q21	1.35 ± 0.8	1.25 ± 0.7	1.06 ± 0.2	1.25 ± 0.8	1.69 ± 1.1	1.31 ± 0.7	**0.002**
Q22	1.78 ± 1.1	1.69 ± 1.0	1.56 ± 0.8	1.98 ± 1.2	1.94 ± 1.2	1.65 ± 0.9	0.204
Q23	1.29 ± 0.7	1.26 ± 0.7	1.11 ± 0.5	1.25 ± 0.8	1.43 ± 0.8	1.28 ± 0.7	0.453
Q24	1.42 ± 0.9	1.39 ± 0.9	1.11 ± 0.5	1.34 ± 0.9	1.62 ± 1.1	1.41 ± 0.9	0.252
Q25	1.47 ± 1.0	1.49 ± 1.0	1.44 ± 0.9	1.41 ± 1.0	1.65 ± 1.1	1.35 ± 0.8	0.478
Q26	1.34 ± 0.8	1.41 ± 0.8	1.06 ± 0.2	1.25 ± 0.7	1.43 ± 0.8	1.31 ± 0.8	0.283

Q1: When I have a pet at home and we no longer want it, the best thing to do is to leave it on the street.
Q2: Animals don't feel when you hit them because they are animals.
Q3: Birds should be kept in cages so that people can admire them.
Q4: If I see that a friend or family member likes to hurt animals, I reprimand them.
Q5: When I have a pet I like to be responsible and take care of it.
Q6: In my house we treat animals well.
Q7: I like to give water or food to animals in the street.
Q8: If I see an animal being mistreated, it is my duty to defend it.
Q9: I have been taught at home that I should respect animals.
Q10: Animals are only good for people's amusement.
Q11: If an animal has a complicated illness, the best thing to do is to get rid of it.
Q12: In my house we use violence, if necessary, to teach the pet what is wrong.
Q13: When I see an animal in the street, I would like to help it.
Q14: If I couldn't look after my pet, I would give it up for adoption.
Q15: Street animals are a nuisance and give a bad image to my city.
Q16: I would like to support an institution where abandoned animals are cared for.
Q17: Animal fights are fun.
Q18: I would like to have classes on animal care in my high school.
Q19: I have the feeling that animals are mistreated.
Q20: It is normal that my grandparents taught the animals by hitting them and I can't do anything about it because they are from another era.
Q21: At home they teach who is in charge by hitting my pet.
Q22: A dog deserves more care than a cow or a bird.
Q23: I'm curious to see a dog fight.
Q24: I'm curious to see a cock fight.
Q25: I'm curious to see a bull fight.
Q26: I would have stuffed animals at home.
*ANOVA test.
†All variables were normally distributed according to Kolmogorov-Smirnoff test ($p < 0.001$ in all cases).

The main results of **Table 3** are summarized below:

- (Q3) Birds should be kept in cages so that people can admire them: second year high school students showed the lowest score (1.40 ± 0.7), while third-year secondary school students showed the highest score (1.86 ± 1.0), inferring a less sensitivity in the latter.
- (Q4) If I see that a friend or family member likes to hurt animals, I reprimand them: third-year secondary school students showed the lowest scores (4.08 ± 1.5 and 3.72 ± 1.7), inferring a less sensitivity.
- (Q14) If I couldn't look after my pet, I would give it up for adoption: second year high school students showed the highest score (4.49 ± 0.7), while third-year

secondary school students showed the lowest score (3.90 ± 1.3), inferring a less sensitivity in the latter.
- (Q15) Street animals are a nuisance and give a bad image to my city: first year high school students showed the highest scores (2.06 ± 1.2), inferring a less sensitivity.
- (Q17) Animal fights are fun: first year high school students showed the highest scores (1.94 ± 1.3), inferring a less sensitivity.
- (Q18) I would like to have classes on animal care in my high school: first year high school students showed the lowest scores (1.94 ± 1.3), inferring a less interest.
- (Q21) At home they teach who is in charge by hitting my pet: first year high school students showed the highest scores (1.69 ± 1.1), inferring a less sensitivity.

To better understand these results, the series was segmented into two groups: secondary school vs. high school students. Questions Q14, Q15, Q18 and Q21 maintained their statistical significance (**Figure 1**). From the present results it can be said that age seems to be an important factor in the perception of animal welfare, with 14-year-old adolescents (third year secondary school students) and 16-year-old adolescents (first year high school students) seeming to be the least sensitive.

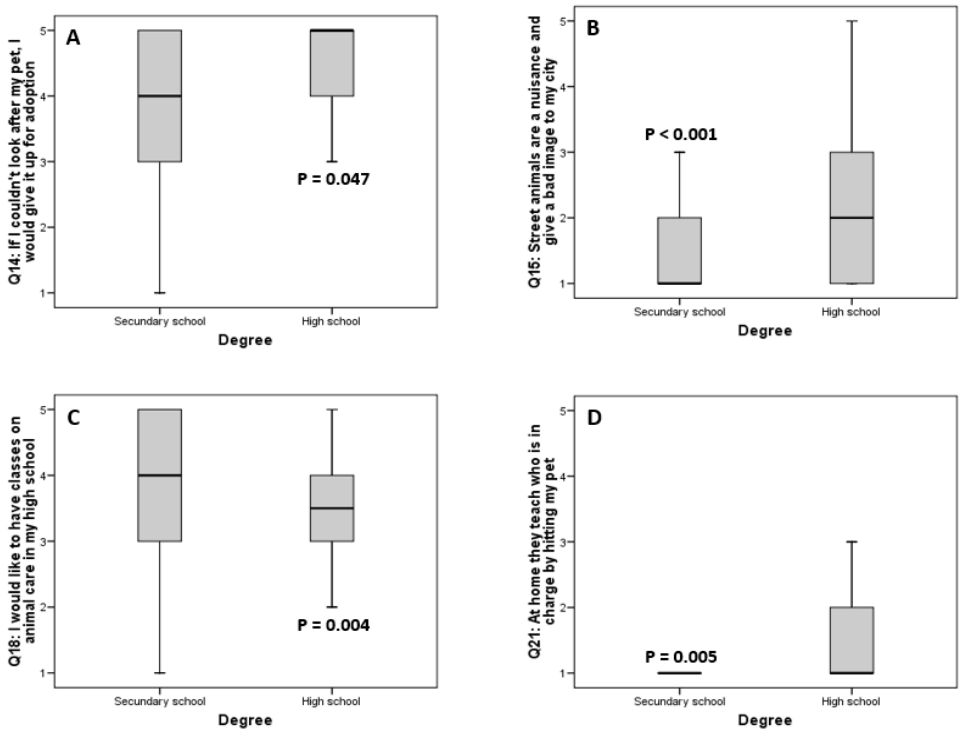

Figure 1. Box plot showing the distribution of answers to the questions Q14, Q15, Q18 and Q21 segmented by degree of study. Only significant results are shown. The lines connect the medians, the boxes cover the 25th to 75th percentiles, and the minimal and maximal values are shown by the ends of the bars. The Y-axis represents the categorical answers to the questions as follows: 1, strongly disagree; 2, disagree; 3, neutral; 4, agree; and 5, strongly agree. *P* values were obtained by ANOVA test.

Table 4 shows the associations of demographic variables and the animal welfare scale. The gender of the individuals was the factor that showed the most statistically significant differences (n = 20), followed by the type of – afterschool – activity (n = 10), and the presence of a family hunter (n = 7).

In all cases, males showed scores that make them less sensitive to animal abuse (**Figure 2A**). For example, females are less likely to agree when asked whether animals suffer less because they are animals (Q2), compared to men (1.0 vs. 1.2, respectively; *P* = 0.009). When asked about the use of violence for animal education (Q12 and Q21), males agreed more than females (1.8 vs. 1.6, *P* = 0.042 and 1.4 vs. 1.2, *P* = 0.019, for Q12 and Q21 respectively). In all cases, males seem to be more interested in watching dogfighting (Q23), cockfighting (Q24) or bullfighting (Q25) (*P* < 0.001).

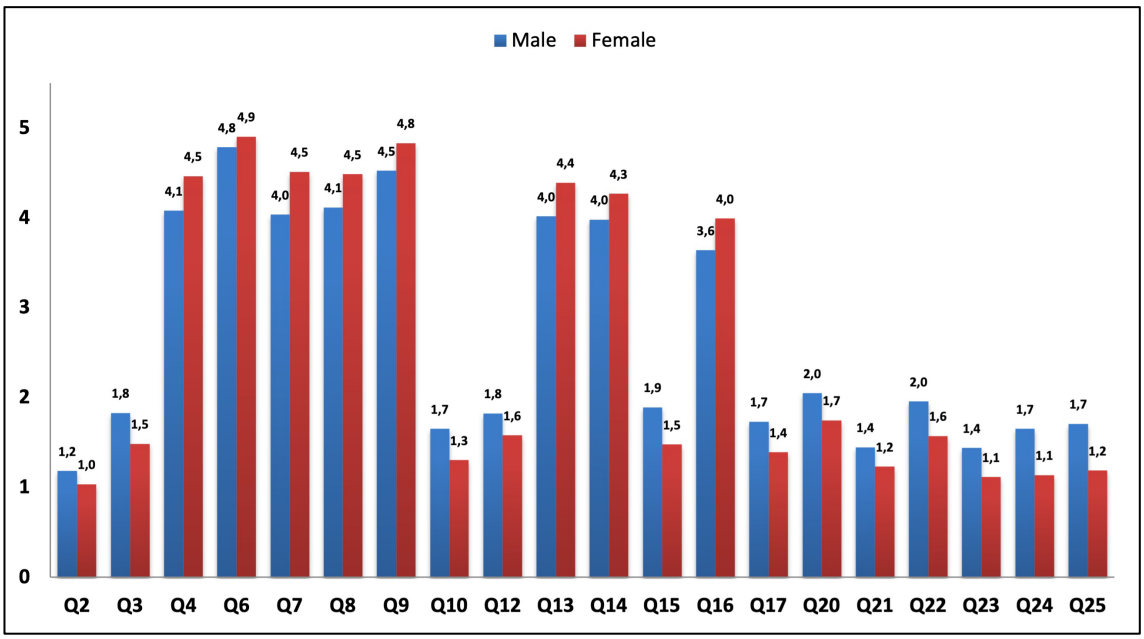

Figure 2A. Bar chart showing the significantly different response values in relation to gender (A), type of after school activity (B) and the presence of a family member who hunts (C).

A similar pattern was observed with regard to the type of afterschool activity: individuals involved in sports seem to be less sensitive to animal abuse than those involved in intellectual/creative activities (**Figure 2B**). Thus, the response profile is repeated in relation to some of the questions mentioned above (Q21: 1.3 vs. 1.2, *P* = 0.040; Q23: 1.4 vs. 1.1, *P* = 0.011; Q24: 1.5 vs. 1.2, *P* = 0.001; and Q25: 1.5 vs. 1.3, *P* = 0.049). Questions related to animal care and protection were most sensitively answered by adolescents in intellectual/creative activities: Q4, Q11, Q14 or Q16 (**Table 4** and **Figure 2B**).

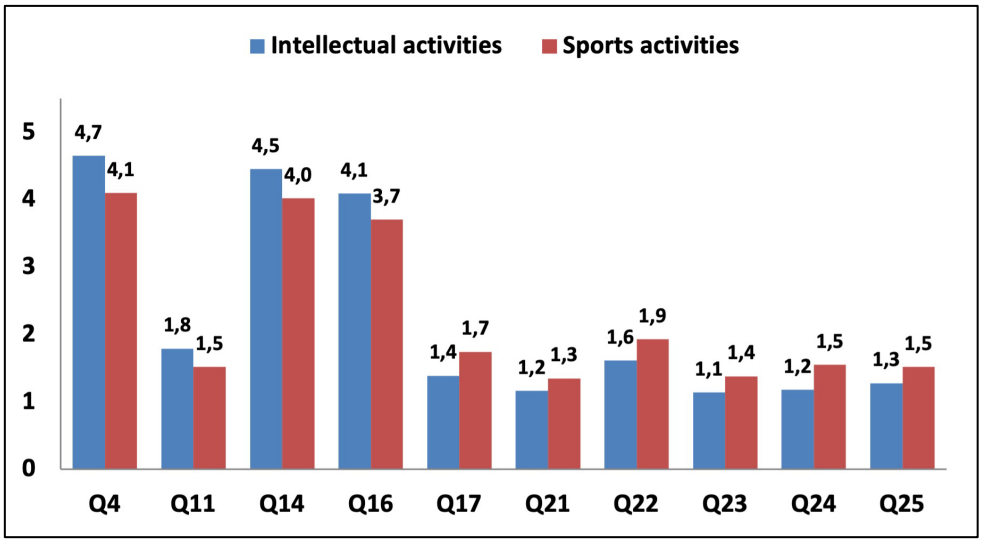

Figure 2B. Bar chart showing the significantly different response values in relation to gender (A), type of after school activity (B) and the presence of a family member who hunts (C).

Although only 17.5% of the series had a family member who was a hunter, the same pattern as above was repeated: adolescents with this status were less sensitive to animal abuse.

This group of individuals is more interested in watching animal fights (Q24 and Q25), finding it even amusing (Q17), considering pets to have less feelings because they are animals (Q2), and agreeing more with the use of violence for the education of animals (Q12 and Q21) (**Table 4** and **Figure 2C**).

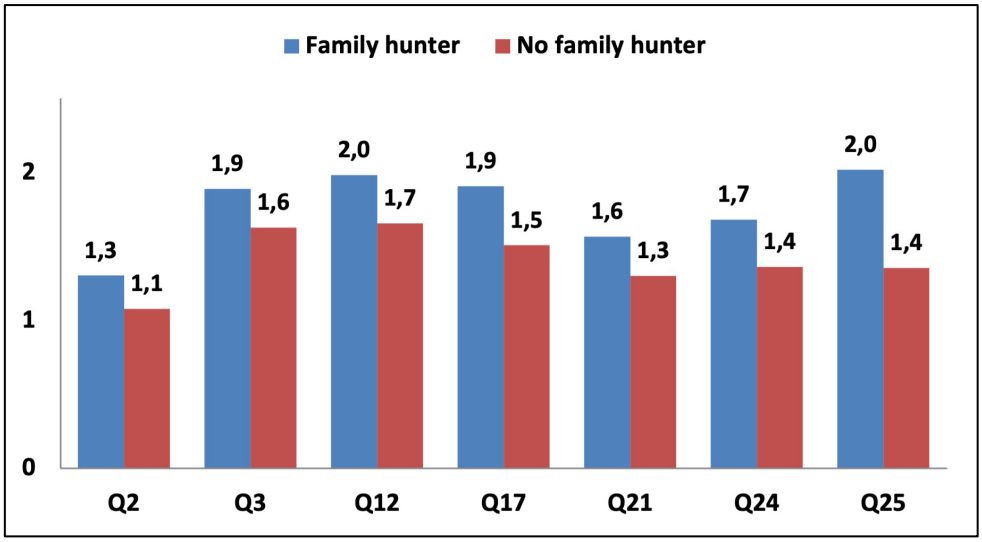

Figure 2C. Bar chart showing the significantly different response values in relation to gender (A), type of after school activity (B) and the presence of a family member who hunts (C).

These three variables (gender, type of afterschool activity and family hunter) were all associated to 4 questions: Q17 (Animal fights are fun), Q21 (At home, they teach who is in charge by hitting my pet), Q24 (I'm curious to see a cock fight) and Q25 (I'm curious to see a bull fight).

Finally, while having or not having a pet (of any kind) did not appear as an important factor, dog and cat ownership was associated to Q12, Q21, Q22 and Q25, and to Q15, Q24 and Q25, respectively (**Table 4**) Thus, adolescents who did not own a dog were more likely to use violence for pets' education (Q12: 1.6 vs. 1.9; Q21: 1.2 vs. 1.4), although they were more curious to see a bullfight (Q25: 1.6 vs. 1.3). This trend was reversed for cats: cat owners were less curious about cockfighting (Q24: 1.3 vs. 1.5) and bullfighting (Q25: 1.3 vs. 1.6). However, teenagers with cats are less likely to think that stray animals give the city a bad image (Q15: 1.3 vs. 1.6). These findings highlight the importance of this individual profile in the perception of animal welfare: male adolescents who plays sports in his spare time, who do not have a dog, and has family members involved in hunting.

Table 4. Association of demographic variables and the animal welfare scale.

	*Gender**	*Habitat**	*Family situation**	*Siblings**	*Afterschool activities**	*Type of activity**	*Pets**	*Nº of pets***	*Nº of species***	*Cats**	*Dogs**	*Family hunter**	*Family fisherman**	*N*
Q1	ns	ns	0.018	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	1
Q2	0.009	ns	ns	ns	0.032	ns	ns	ns	ns	ns	ns	0.003	ns	3
Q3	< 0.001	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.037	ns	2
Q4	0.011	ns	0.005	ns	ns	0.001	ns	ns	ns	ns	ns	ns	ns	3
Q5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0
Q6	0.023	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	1
Q7	< 0.001	ns	ns	ns	ns	ns	ns	0.029	0.005	ns	ns	ns	ns	3
Q8	< 0.001	ns	ns	ns	ns	ns	ns	ns	0.011	ns	ns	ns	ns	2
Q9	< 0.001	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	1
Q10	< 0.001	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	1
Q11	ns	ns	ns	ns	ns	0.038	ns	ns	ns	ns	ns	ns	ns	1
Q12	0.042	ns	ns	ns	ns	ns	0.003	ns	ns	ns	0.038	0.037	ns	4
Q13	0.001	ns	ns	ns	ns	ns	0.011	ns	ns	ns	ns	ns	ns	2
Q14	0.024	ns	0.017	ns	ns	0.002	ns	ns	ns	ns	ns	ns	ns	3
Q15	< 0.001	ns	ns	ns	ns	ns	ns	ns	0.014	0.001	ns	ns	ns	3
Q16	0.017	ns	ns	ns	ns	0.030	ns	ns	ns	ns	ns	ns	ns	2
Q17	0.006	ns	ns	ns	ns	0.011	ns	ns	ns	ns	ns	ns	0.016	3
Q18	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0
Q19	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0
Q20	0.016	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	1
Q21	0.019	ns	ns	0.031	0.042	0.040	ns	ns	ns	ns	0.046	ns	0.029	6
Q22	0.001	ns	ns	ns	ns	0.023	ns	ns	ns	ns	0.019	ns	ns	3
Q23	< 0.001	ns	ns	ns	ns	0.011	ns	ns	ns	ns	ns	ns	ns	2
Q24	< 0.001	ns	ns	ns	ns	0.001	ns	ns	ns	0.045	ns	ns	0.024	4
Q25	< 0.001	ns	ns	ns	ns	0.049	ns	ns	ns	0.040	0.037	ns	< 0.001	5
Q26	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0
N	20 (76.9)	0	3 (11.5)	1 (3.8)	2 (7.7)	10 (38.5)	2 (7.7)	1 (3.8)	3 (11.5)	3 (11.5)	4 (15.4)	7 (26.9)	0	

Following the strategy of analysis of Monzalvo & Torres [22], the questions were condensed into two groups: animal care and protection and no animal abuse. **Table 5** shows the association of demographic variables and the animal welfare scale segmented in these two groups. Gender was associated to both groups ($P < 0.001$), as well as type of (afterschool) activity ($P = 0.018$ and $P = 0.012$, respectively). Having a relative who is a hunter was associated with the group of questions grouped as "*No animal abuse*" ($P < 0.001$). The questions are grouped according to the direction of the answers, confirming the profile outlined above with regard to the perception of animal welfare (**Table 5**). In addition to the above, it is interesting to note that the greater the number of species kept as pets, the greater the animal care and protection (46.9, 47.8 and 45.8 for 1, 2 and ≥ 3 different species, respectively; $P = 0.046$).

Table 5. Distribution of demographic variables significantly associated with animal care and protection and no animal abuse.

	Animal care and protection	*P value*	*No animal abuse*	*P value*
*Gender**		< 0.001		< 0.001
Male	46.5 ± 5.8		22.6 ± 6.4	
Female	48.9 ± 5.2		18.6 ± 4.5	
Type of activity†*		0.018		0.012
Intellectual	49.0 ± 4.6		19.4 ± 4.2	
Sports	47.3 ± 5.6		21.3 ± 6.6	
*Number of species***		0.046		ns
1	46.9 ± 6.2		—	
2	47.8 ± 4.6		—	
≥ 3	48.5 ± 5.4		—	
*Cats**		ns		0.046
Yes	—		19.8 ± 4.9	
No	—		21.4 ± 6.7	
*Family hunter**		ns		< 0.001
Yes	—		23.7 ± 7.8	
No	—		20.1 ± 5.3	

Numbers show mean and standard deviation. Significant *P* values are included.
Abbreviation: ns, non-significant.
Animal care protection represents the sum of questions 4, 5, 6, 7, 8, 9, 13, 14, 16, 18, 19 and 22, according to a modification from Montalvo-Curriel et al. (2021).
No animal abuse represents the sum of questions 1, 2, 3, 10, 11, 12, 15, 17, 20, 21, 23, 24, 25 and 26 according to a modification from Montalvo-Curriel et al. (2021).
* Student T-test.
** ANOVA test.
† Intellectual afterschool activities include art performance and support classes; sports include football, swimming, athletics, gymnastics, and horse riding, among others.

5.2. Perception of animal welfare among students from the Veterinary Faculty (ULPGC)

A total of 223 students from the Faculty of Veterinary Medicine of Las Palmas de Gran Canaria University (Canary Islands, Spain) were interviewed about their perception of animal abuse, which represents 56.3% of the total enrolment (total number of students at the Faculty of Veterinary Medicine in the academic year 2022-2023 = 396). By course of study, 60.3% (44 out of 73), 61.4% (43 out of 70), 54.2% (39 out of 72), 59.4% (41 out of 69) and 50.0% (56 out of 112) of the students responded to the survey, for subjects from first to fifth grade, respectively.

The main socio-demographic characteristics are summarized in **Table 6**. Briefly, mean age was 21.5 years, and the majority of subjects were females (77.1%), which represents the typical profile of a student in our faculty. Most of the series lived in an urban environment (70.4%), in a family with married parents (59.2%) and siblings (83.4%). Finally, most individuals lived with a pet (91.5%), with dogs being the predominant species (65.5%). A total of 36 (16.1%) and 57 (25.6%) individuals had a relative who was a hunter or fisherman (**Table 6**).

In order to find out the influence of age on the perception of animal welfare, the series was segmented according to the study year the individual was attending at the time of the survey. No significant differences were observed in the distribution of the main socio-demographic variables in relation to this segmentation. As expected, the distribution of age in relation to academic year showed a significant difference ($P < 0.001$).

Table 6. Demographic characteristics of the students of the Faculty of Veterinary Medicine, in the whole series and segmented according to year of study.

	Whole series	**First stage**			**Second stage**		***P* value#**
	(n = 223)	1st year (n = 44)	2nd year (n = 43)	3rd year (n = 39)	4th year (n = 41)	5th year (n = 56)	
Variable	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
Gender							0.691
Male	51 (22.9)	10 (22.7)	11 (25.6)	9 (23.1)	6 (14.6)	15 (26.8)	
Female	172 (77.1)	34 (77.3)	32 (74.4)	30 (76.9)	35 (85.4)	41 (73.2)	
Age (mean ± SD)	21.5 ± 3.2	18.4 ± 1.1	20.1 ± 2.5	21.7 ± 3.6	23.0 ± 3.0	23.7 ± 2.1	< 0.001†
Stage							—
First	126 (56.5)	NA	NA	NA	NA	NA	
Second	97 (43.5)	NA	NA	NA	NA	NA	
Habitat							0.984
Rural	66 (29.6)	13 (29.5)	14 (32.6)	12 (30.8)	11 (26.8)	16 (28.6)	
Urban	157 (70.4)	31 (70.5)	29 (67.4)	27 (69.2)	30 (73.2)	40 (71.4)	
Family situation							0.326
Married parents	132 (59.2)	30 (68.2)	22 (51.2)	25 (64.1)	22 (53.7)	33 (58.9)	

Divorced parents	69 (30.9)	8 (18.2)	14 (32.6)	11 (28.2)	16 (39.0)	20 (35.7)	
Others	22 (9.9)	6 (13.6)	7 (16.3)	3 (7.7)	3 (7.3)	3 (5.4)	
Siblings (yes)	186 (83.4)	38 (86.4)	35 (81.4)	33 (84.6)	30 (73.2)	50 (89.3)	0.293
Pets (yes)	204 (91.5)	39 (88.6)	37 (86.0)	37 (94.9)	37 (90.2)	54 (96.4)	0.342
Number of pets							0.615
1	68 (33.3)	12 (30.8)	12 (32.4)	11 (29.7)	16 (43.2)	17 (31.5)	
2	36 (17.6)	11 (28.2)	9 (24.3)	5 (13.5)	3 (8.1)	8 (14.8)	
3-5	70 (34.3)	12 (30.8)	12 (32.4)	13 (35.1)	12 (32.4)	21 (38.9)	
≥ 6	30 (14.7)	4 (10.3)	4 (10.8)	8 (21.6)	6 (16.2)	8 (14.8)	
Number of species							0.831
1	114 (55.9)	19 (48.7)	22 (59.5)	19 (51.4)	23 (62.2)	31 (57.4)	
2	60 (29.4)	13 (33.3)	11 (29.7)	12 (32.4)	7 (18.9)	17 (31.5)	
≥ 3	30 (14.7)	7 (17.9)	4 (10.8)	6 (16.2)	7 (18.9)	6 (11.1)	
Cats (yes)	76 (34.1)	14 (35.9)	14 (37.8)	14 (37.8)	11 (29.7)	23 (42.6)	0.810
Dogs (yes)	146 (65.5)	27 (69.2)	24 (64.9)	31 (83.8)	26 (70.3)	38 (70.4)	0.448
Family hunter (yes)	36 (16.1)	10 (22.7)	2 (4.7)	7 (17.9)	7 (17.1)	10 (17.9)	0.211
Family fisherman (yes)	57 (25.6)	13 (29.5)	7 (16.3)	9 (23.1)	11 (26.8)	17 (30.4)	0.533

Note: Abbreviations: SD, standard deviation; NA, not applicable.
Chi square test.
† Kruskal-Wallis test.

Table 7 shows the results of the surveys - on a scale of 1 to 5, where 1 was strongly disagrees and 5 was strongly agrees -, both for the whole series and in relation to the segmentation by academic year. Of the total of 20 questions, 6 showed a significantly different distribution of responses between groups: Q1 (My perception of animal welfare and mistreatment has changed since I started my studies; $P < 0.001$), Q4 (I know how to act in cases of animal abuse; $P = 0.038$), Q6 (I would treat an abandoned animal that is about to die for free; $P = 0.007$), Q12 (Cats are difficult patients to handle, and therefore more susceptible to animal abuse; $P = 0.025$), Q15 (The euthanasia of aggressive dogs that have bitten people is totally understandable; $P = 0.008$), and Q17 (I think that violent people and/or people with anger problems should not keep animals; $P = 0.040$).

Table 7. Distribution (mean ± standard deviation (SD)) of the variables of the animal welfare scale of students of the Faculty of Veterinary Medicine, in the whole population and segmented according to year of study.

	Whole series	**First stage**			**Second stage**		***P* value***
	(n = 223)	1st year (n = 44)	2nd year (n = 43)	3rd year (n = 39)	**4th year (n = 41)**	5th year (n = 56)	
Variable†	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	
Q1	3.57 ± 1.2	2.80 ± 1.2	3.21 ± 1.2	3.77 ± 1.1	3.98 ± 1.2	4.00 ± 1.1	**< 0.001**
Q2	4.87 ± 0.5	4.89 ± 0.4	4.91 ± 0.3	4.87 ± 0.3	4.85 ± 0.7	4.84 ± 0.6	0.966
Q3	3.87 ± 1.2	3.57 ± 1.1	3.74 ± 1.1	3.97 ± 1.1	4.20 ± 1.2	3.91 ± 1.1	0.128

Q4	3.29 ± 1.1	3.09 ± 1.3	3.09 ± 1.0	3.15 ± 1.1	3.29 ± 1.2	3.68 ± 0.9	**0.038**
Q5	4.03 ± 1.1	4.20 ± 1.0	3.95 ± 1.2	4.05 ± 0.9	3.98 ± 1.1	3.96 ± 1.0	0.786
Q6	4.42 ± 0.9	4.77 ± 0.5	4.56 ± 0.8	4.08 ± 1.0	4.32 ± 1.1	4.34 ± 1.0	**0.007**
Q7	2.90 ± 1.2	3.20 ± 1.2	2.81 ± 1.1	3.00 ± 1.1	2.93 ± 1.3	2.64 ± 1.2	0.186
Q8	2.23 ± 1.2	2.16 ± 1.1	2.33 ± 1.2	2.67 ± 1.2	2.10 ± 1.3	2.02 ± 1.1	0.085
Q9	4.76 ± 0.6	4.82 ± 0.4	4.81 ± 0.5	4.72 ± 0.5	4.80 ± 0.7	4.66 ± 0.7	0.592
Q10	1.85 ± 1.0	2.00 ± 1.0	1.83 ± 0.9	2.05 ± 0.9	1.85 ± 1.2	1.61 ± 1.0	0.212
Q11	3.84 ± 1.2	3.64 ± 1.2	3.78 ± 1.1	3.74 ± 1.3	4.05 ± 1.1	3.95 ± 1.2	0.484
Q12	3.03 ± 1.3	2.57 ± 1.3	2.88 ± 1.1	3.44 ± 1.1	3.22 ± 1.4	3.07 ± 1.3	**0.025**
Q13	1.13 ± 0.5	1.07 ± 0.3	1.09 ± 0.5	1.13 ± 0.4	1.20 ± 0.7	1.18 ± 0.6	0.769
Q14	1.74 ± 1.0	1.73 ± 1.1	1.70 ± 0.9	2.05 ± 1.2	1.59 ± 0.8	1.68 ± 1.0	0.285
Q15	1.67 ± 0.9	1.61 ± 0.9	1.33 ± 0.5	1.90 ± 0.9	1.56 ± 0.8	1.89 ± 1.1	**0.008**
Q16	4.06 ± 1.0	4.23 ± 0.9	4.05 ± 0.9	3.85 ± 1.0	4.10 ± 0.9	4.07 ± 1.1	0.501
Q17	4.13 ± 1.1	3.95 ± 1.0	4.60 ± 0.8	4.15 ± 1.1	3.95 ± 1.3	4.04 ± 1.2	**0.040**
Q18	4.18 ± 1.0	3.98 ± 1.0	4.31 ± 0.9	4.05 ± 1.0	4.32 ± 1.0	4.21 ± 1.0	0.421
Q19	2.20 ± 1.4	2.00 ± 1.5	2.07 ± 1.5	2.38 ± 1.4	2.17 ± 1.5	2.34 ± 1.3	0.661
Q20	3.89 ± 1.0	4.05 ± 0.9	3.88 ± 0.9	3.64 ± 1.2	3.93 ± 1.0	3.93 ± 1.1	0.491

Note:
Q1: My perception of animal welfare and mistreatment has changed since I started my studies.
Q2: I understand that my role as a future veterinarian is also to report cases of animal abuse.
Q3: Since studying veterinary medicine, I have been correcting the dynamics of mistreatment in my environment.
Q4: I know how to act in cases of animal abuse.
Q5: I would be able to take the pet away from a person I know is mistreating it.
Q6: I would treat an abandoned animal that is about to die for free.
Q7: I agree with preserving a breed through catteries.
Q8: Feral cats are a problem for biodiversity and should therefore be eliminated.
Q9: I would like to see more importance given to animal abuse.
Q10: Animals at the faculty are there to learn, mistakes that endanger their lives are collateral damage.
Q11: Veterinary malpractice is a form of animal abuse.
Q12: Cats are difficult patients to handle, and therefore more susceptible to animal abuse.
Q13: No matter under what conditions an animal is euthanized, it will still die.
Q14: I would consent to the euthanasia of a pet at the behest of its owner even if I knew for certain that it could be given more years of life with veterinary treatment.
Q15: The euthanasia of aggressive dogs that have bitten people is totally understandable.
Q16: I think that society is not aware of animal abuse.
Q17: I think that violent people and/or people with anger problems should not keep animals.
Q18: If I know of cases of domestic violence, I fear for your pet.
Q19: I know of cases of animal abuse close to me.
Q20: I recognize when a dog is afraid of its owner.
*ANOVA test.
†All variables were normally distributed according to Kolmogorov-Smirnoff test ($p < 0.001$ in all cases).

The main results of **Table 7** are summarized below:

- (Q1) My perception of animal welfare and mistreatment has changed since I started my studies: The more advanced the student is in his or her studies, the more he or she perceives that (2.80 vs. 4.00 for first- and fifth-year students, respectively).

- (Q4) I know how to act in cases of animal abuse: The more advanced the student is in his or her studies, the more he or she perceives that (3.09 vs. 3.68 for first- and fifth-year students, respectively).

- (Q6) I would treat an abandoned animal that is about to die for free: The more advanced the student is in his or her studies, the less he or she intends to undertake free treatment (4.77 vs. 4.34 for first- and fifth-year students, respectively).

- (Q12) Cats are difficult patients to handle, and therefore more susceptible to animal abuse: First year students are the least likely to perceive this (2.57), with third- and fourth-year students being the most likely to agree with this observation (3.44 and 3.22, respectively).

- (Q15) The euthanasia of aggressive dogs that have bitten people is totally understandable: The more advanced the student is in his or her studies, the more he or she perceives that (1.61 vs. 1.89 for first- and fifth-year students, respectively), although the trend is not linear.

- (Q17) I think that violent people and/or people with anger problems should not keep animals: Second year students were the most in agreement with this observation (4.60).

To better understand these results, the series was segmented into two groups: first stage (years 1-3) vs. second stage (years 4-5) students. Questions Q1 and Q4 maintained their statistical significance ($P < 0.001$ and $P = 0.007$, respectively). Interestingly, Q8 (Feral cats are a problem for biodiversity and should therefore be eliminated) showed a significant difference ($P = 0.043$): mean ± SD were 2.37 ± 1.2 and 2.05 ± 1.2, for first and second stage students respectively, suggesting that it is perceived to be more of a problem among younger students. From the present results it can be said that sensitivity to animal welfare, including academic training on how to proceed in case of animal abuse, increases as one progresses through one's studies. However, as students approach the end of their studies, they are less willing to make gratuitous efforts.

Table 8 shows the associations of demographic variables and the animal welfare scale. The gender of the individuals was the factor that showed the most statistically significant differences (n = 9), followed by the presence of a family hunter (n = 5), and owning a dog (n = 4).

Table 8. Association of demographic variables and the animal welfare scale in the group of students of the Faculty of Veterinary Medicine.

	*Gender**	*Habitat**	*Family situation**	*Siblings**	*Pets**	*Nº of pets***	*Nº of species***	*Cats**	*Dogs**	*Family hunter**	*Family fisherman**	*N*
Q1	ns	ns	0.039	ns	ns	ns	ns	ns	ns	ns	ns	1
Q2	0.042	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.015	2
Q3	<0.004	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	1
Q4	ns	ns	0.005	ns	ns	ns	ns	ns	0.017	ns	ns	1
Q5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0
Q6	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0
Q7	< 0.001	ns	0.049	ns	ns	ns	ns	ns	0.035	0.025	ns	4
Q8	0.007	ns	ns	ns	ns	ns	0.010	ns	ns	0.027	ns	3
Q9	0.023	0.045	ns	ns	ns	ns	ns	ns	ns	ns	0.009	3
Q10	0.029	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	1
Q11	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0
Q12	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.022	ns	1
Q13	ns	ns	ns	ns	< 0.001	ns	0.008	ns	ns	ns	ns	2
Q14	0.005	ns	0.017	ns	ns	ns	ns	ns	ns	ns	ns	1
Q15	0.030	ns	ns	ns	ns	ns	ns	ns	ns	0.023	0.013	3
Q16	0.003	0.015	ns	ns	ns	ns	ns	ns	0.041	ns	ns	3
Q17	ns	ns	ns	0.037	ns	ns	ns	ns	ns	ns	0.016	1
Q18	ns	ns	ns	ns	0.043	ns	ns	ns	0.045	ns	ns	2
Q19	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.034	ns	2
Q20	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0
N	9 (45.0)	2 (10.0)	3 (5.0)	1 (5.0)	2 (10.0)	0	2 (10.0)	0	4 (20.0)	5 (25.0)	3 (15.0)	

Abbreviation: ns, non-significant; N, number of significant associations and percentage in relation to the total number of questions. * Student T-test. ** ANOVA test.

Females scored higher - they agreed more - with questions Q2 (I understand that my role as a future veterinarian is also to report cases of animal abuse), Q3 (Since studying veterinary medicine, I have been correcting the dynamics of mistreatment in my environment), Q9 (I would like to see more importance given to animal abuse), and Q16 (I think that society is not aware of animal abuse) (**Figure 3A**): $P = 0.042$, $P = 0.004$, $P = 0.023$, and $P = 0.003$, respectively (**Table 8**). In the other hand, males scored higher - they agreed more - with questions Q7 (I agree with preserving a breed through catteries), Q8 (Feral cats are a problem for biodiversity and should therefore be eliminated), Q10 (Animals at the faculty are there to learn, mistakes that endanger their lives are collateral damage), Q14 (I would consent to the euthanasia of a pet at the behest of its owner even if I knew for certain that it could be given more years of life with veterinary treatment), and Q15 (The euthanasia of aggressive dogs that have bitten people is totally understandable) (**Figure 3A**): $P < 0.001$, $P = 0.007$, $P = 0.029$, $P = 0.005$ and $P = 0.030$, respectively (**Table 8**). Taken together, males showed scores that make them less sensitive to animal abuse.

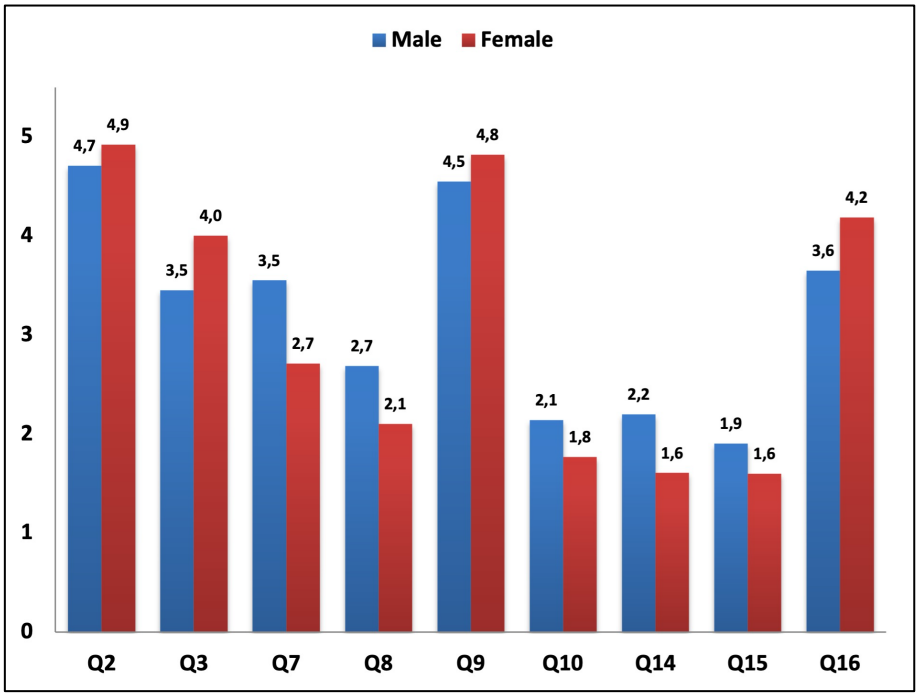

Figure 3A. Bar chart showing the significantly different response values in relation to gender.

Dog owners scored higher - they agreed more - with questions Q4 (I know how to act in cases of animal abuse), and Q18 (If I know of cases of domestic violence, I fear for your pet) (Figure 3B): *P* = 0.017 and *P* = 0.045, respectively (**Table 8**). In the other hand, those students without dogs scored higher - they agreed more - with questions Q7 (I agree with preserving a breed through catteries), and Q16 (I think that society is not aware of animal abuse) (**Figure 3B**): *P* = 0.035 and *P* = 0.041, respectively (**Table 8**).

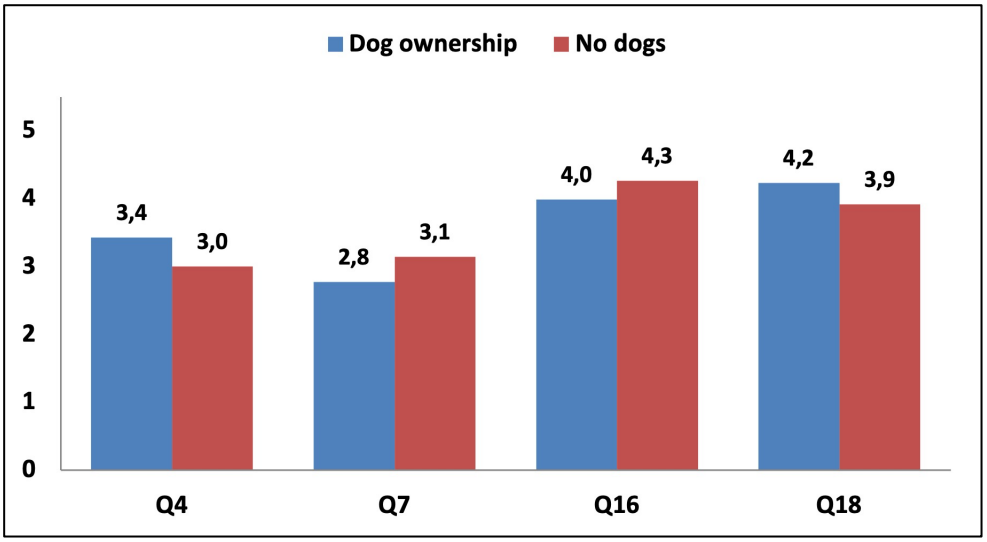

Figure 3B. Bar chart showing the significantly different response values in relation having a dog.

Although only 16.1% of the series had a family member who was a hunter, significant differences were observed: they scored higher - they agreed more - with questions Q7 (I agree with preserving a breed through catteries), Q8 (Feral cats are a problem for biodiversity and should therefore be eliminated), Q15 (The euthanasia of aggressive dogs that have bitten people is totally understandable), and Q19 (I know of cases of animal abuse close to me) (**Figure 3C**): $P = 0.025$, $P = 0.027$, $P = 0.023$, and $P = 0.034$, respectively (**Table 8**).

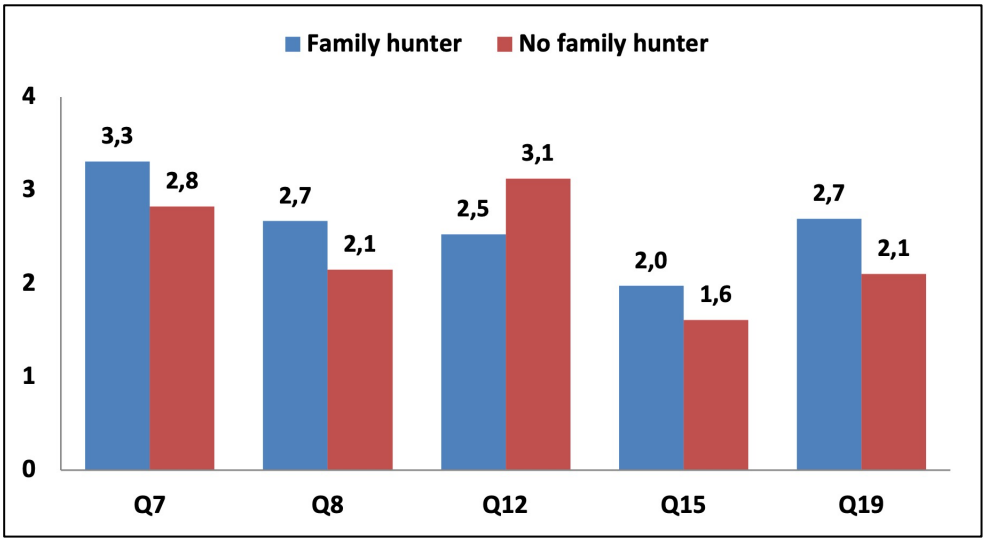

Figure 3C. Bar chart showing the significantly different response values in relation to a presence of a family member who hunts.

These three variables (gender, dog ownership and family hunter) were all associated to 1 question: Q7 (I agree with preserving a breed through catteries). In contrast to the adolescents, students with fishermen relatives showed a less sensitive profile towards animal welfare, understanding less that, as future veterinarians, they should report cases of animal abuse (Q2): 4.74 vs. 4.92 ($P = 0.015$); they give less importance to animal abuse (Q9): 4.51 vs. 4.84 ($P = 0.009$) and they consider euthanasia of aggressive animals to be more appropriate (Q15): 1.95 vs. 1.57 ($P = 0.013$) (**Table 8**).

It is noteworthy that students living in rural environments (29.6 % of the series) seem to perceive animal welfare less, having shown lower scores - they agree less - with questions Q9 (I would like to see more importance given to animal abuse) and Q16 (I think that society is not aware of animal abuse): 4.64 vs. 4.81 and 3.82 vs. 4.17, for Q9 and Q16, respectively ($P = 0.045$ and $P = 0.015$ (**Table 8**). These findings highlight the importance of this individual profile in the perception of animal welfare: male who do not have a dog and live-in rural habitats and has family members involved in hunting or fishing.

5.3. Perception among veterinarians specialized in animal welfare and law enforcement related to legal interventions of animal abuse.

Three people were interviewed whose work focuses on the care and prevention of animal abuse on the island of Gran Canaria. The interviews lasted approximately one hour, and the questions were previously elaborated to a person working in the front line of an animal protection organization (section 5.3.1), to the director of Bañaderos Island Shelter (Las Palmas) (section 5.3.2) and finally, to an agent from the nature protection service (SEPRONA) (section 5.3.3). The answers are set out in ANNEX II, and the questions are presented below:

1) What is animal abuse? What is not animal abuse?
2) Do you receive many reports of animal abuse?
3) Who denounces most?
4) Who mistreats more?
5) In which areas of the island is animal abuse most reported?
6) Which species are commonly abused?
7) What does the scene of abuse look like? What indicators are most important in determining this crime? What indicators are the most important for the determination of this crime?
8) How do the owners show themselves?
9) Do animals have any behavioral patterns?
10) Where do the seized animals go and who takes care of them?
11) What has been the worst case of animal abuse you have been part of?
12) When there is fragrant abuse, is it investigated further?
13) Do you think veterinarians do a good job in identifying and reporting abuse mistreatment? If not, what do you think is the cause?
14) At what point in the procedure is the complaint slowed down to be completed?
15) Is society aware of the issue of abuse and have you seen any changes compared to previous years?
16) How would you assess the relationship between adolescents and animals today?
17) How can we improve awareness of animal abuse, and therefore prevent it? What about veterinarians?

6. DISCUSSION

Humans have an innate affinity with the living world that leads us to interact and form emotional bonds with other life forms [23], giving rise to the human-animal bond, defined by the American Veterinary Medical Association (AVMA) as "a dynamic and mutually beneficial relationship between humans and other animals that is influenced by behaviors essential to the health and well-being of both" [24].

This type of bond is particularly important for children and young people. In that sense, Collins and McNicholas (1998) found that children consider their pets to be close family members, not only because they live in the same house, but also because of the functions they perform [25]. In fact, children who develop a bond with their pets have higher scores in empathy, self-esteem and self-knowledge than those who do not have pets [26-28]. In addition, pet ownership promotes the development of trust, responsibility and compassion, among others [29]. For this reason, a possible explanation is found for the data obtained in the analysis of the adolescent study, in which those who did not have pets were more likely to use violence to train their supposed pet than those who had animals at home (Q12: 1.6 vs. 1.9; Q21: 1.2 vs. 1.4).

Understanding pets as members of the family [27], the bond that children develop with their pets is particularly strong in families with multiple dysfunctional factors, such as social disadvantage, poverty, poor parental education, as well as crime and substance abuse [30]. In fact, many authors show that those children who experience family or animal violence are most likely to have been exposed to some additional type of abuse, suggesting the presence of a violent family environment [31].

At the same time, cruelty to animals is defined differently according to the environment in which the owners live (rural vs. urban) [32]. In this way, animals in rural areas are attributed mainly practical functions [33] rather than companionship and affection, and their ability to feel pain, hunger, or sadness is ignored. This observation agrees with the results of our study, where 90.7% of the respondents lived in rural areas, they showed higher scores for Q2 (animals do not feel when you hit them because they are animals) and Q22 (a dog deserves more care than a cow or a bird), as well as the firmness with which the professionals interviewed affirmed that much more cruelty to animals occurs in rural areas than in urban areas (5.3.2).

On the other hand, in this rural context, where pets are complementary tools for environmental tasks, hunting is one of the most important recreational and economic activities [32]. Spain is one of the European Union countries with the highest number of hunters. According to the Federation of Associations for Hunting and Conservation of the European Union [34], our country registered 980,000 hunters in 2010, making it the second country with the most hunters after France [35].This means that 2% of the Spanish population practices hunting, with

men being the main practitioners [36]. However, of this total number of hunters, only half were registered with the Spanish Hunting Federation in the same year [37]. Furthermore, when hunting with dogs, most of them have at least one animal, although it is common to have more than one [38]. In that sense, it is clear from our study that rural adolescents with hunting relatives have more than one dog at home. However, one of the main causes of animal abandonment described in our country is that, according to the latest report published by the Affinity Foundation (2022) on dogs and cats abandoned in Spain during 2017: the end of the hunting season was the second cause of pet abandonment in Spain, reinforcing the idea that animals in rural areas have a purely practical function [39].

This raises the question of whether the welfare of animals is being adequately considered in the rural areas to which our respondents belong (90.7%). On the one hand, it is worth noting that adolescents from rural areas had a worse perception of animal welfare, as they scored lower on questions Q9 (I would like animal abuse to be given more importance) and Q16 (I think society is not aware of animal abuse): 4.64 vs. 4.81 and 3.82 vs. 4.17 for Q9 and Q16 respectively (P = 0.045 and P = 0.015). On the other hand, the children in the study who had hunting relatives were particularly interested in watching an animal fight (Q17 (P = 1.9): Animal fights are fun), whether it was a dog fight (Q23: I am curious to see a dog fight), a cock fight (Q24 (P = 1.7): I am curious to see a cockfight) and/or a bullfight (Q25 (P = 2.0): I am curious to see a bull fight), a factor that is likely to be explained by the festive environment surrounding hunting and the normalized violence of such an act [40].

Relationships in the rural world are much closer than in the city, as they have always shared much more than the environment [41], which has led to the early involvement of young people in hunting activities. This sharing is particularly worrying given the explicit peer approval of this type of violence and the rewards for those who perpetrate it [40].

Social learning plays a role in the mistreatment of animals by children and adolescents, especially when these behaviors are perpetrated by important figures in their lives [31]. Furthermore, in the study 'Rural and urban differences in the commission of animal cruelty' (2005), rural respondents were mainly affected by witnessing family members mistreating animals, whereas urban respondents learned about cruelty from family and friends [32]. This is why in question Q20 (It's normal for my grandparents to raise their pets by beating them, and I can't do anything about it because they are from another era), higher scores - agreement - were obtained from young people from rural areas than from those living in urban areas. Something similar happened with question Q4 (if I see a relative or a friend beating animals, I draw their attention to it) with a score of 4.08 ± 1.5 (P = 0.029) for the youngest ones. In the same line, the professionals interviewed stated: "*Young people in rural areas have much more normalized animal abuse".* According to experts, early exposure to animal abuse is as close

to a traumatic event as being a direct victim of physical abuse [42], and is a strong predictor of later behaviors through imitation [32].

In the same way, it has been described that violence against legally protected animals, such as hunting, is often accompanied by other unauthorized expressions of violence because of the festive and tolerant atmosphere surrounding the violence [43]. According to research by Clifton Flynn (2002) among young people, males who hunted were twice as likely as non-hunters to have committed acts of animal cruelty against stray and/or wild animals [40]. This was confirmed in the present study with question Q15 (Stray animals give my town a bad image), where minors with hunting relatives scored higher than those without (2 vs. 1.6).

The present results are clear and support our first hypothesis: patterns of animal abuse are inherited or learned, and the determining factor is the socio-demographic environment in which the child is surrounded, which defines a specific individual profile: male, without a dog, living in rural areas, with family members involved in hunting or fishing. Therefore, animal abuse can be expected to act as a disruptor in the development of people's psychic capacities, such as empathy, with particularly significant damage in children and adolescents up to the age of 19 [32, 44]. The results of this study are in line with previous literature [26], and it is that adolescents at the age of 14 are probably less sensitive to animal welfare than those at the age of 16, which is reflected in question Q4, where students in the third year of high school had the lowest scores (4.08 ± 1.5 and 3.72 ± 1.7), a factor that can be explained by age as a modulating variable of empathy [45].

At the same time, empathy is also modulated by gender. According to the literature, women are more empathetic than men, both towards humans and animals [46], while men are more likely to be violent towards animals [47], which explains their higher scores on the three psychopathic variables: less remorse and guilt, less interest in the feelings of others, and less expression of emotions [48]. This assertion is supported by the results of this study, shown in Figure 2A, which show that men are less sensitive to animal abuse than women, being less likely to agree to use force to train their pet (Q12 and Q21) (1.8 vs. 1.6, $P = 0.042$ and 1.4 vs. 1.2).

Similarly, cultural spill over theory, as described by Baron and Straus (1987), argues that violence in a particular domain or sphere tends to filter or spread to other domains, including those where it is not sanctioned [49]. Within the narrative of hunting, where the 'predator is played', a patriarchal culture is favored in which masculinity is defined as aggressive, powerful, and violent [50]. For this reason, in a study of abusive couples, 52% who abused their pets also hunted, compared to only 11% who had pets and did not engage in this form of abuse [43].

At the same time, there are several studies that also link gender-based violence to cruelty towards animals [30, 51, 52], stating that aggression towards animals are related with aggression towards humans [53]. In that sense, animal abuse perpetrated by a gendered perpetrator was assessed using a five-item scale [54, 55]: emotional abuse of animals, threats to harm animals, neglect of animals, physical abuse of animals, and finally, severe physical abuse of animals. It was observed a positive correlation between domestic violence and negative interactions with the household pet. The main motivations for this type of violence are, on the one hand, instrumental: threatening, beating or killing the pet with the aim of causing suffering to the human victim, as well as manipulating and intimidating him/her [56], and, on the other hand, expressive, in which the punishment is shifted from the partner to the animal [50, 54]. The use of these types of violence has been confirmed by various interviews with women victims of gender-based violence in different shelters, most of whom stated that their abuser had previously threatened and/or beaten their pet [50, 57, 58]. This is because animal abuse 'socializes' the perpetrator with violence, symbolizing the crossing of a barrier, and once the animal has been abused, there are fewer inhibitions, making acts of cruelty towards other family members more likely [59]. Taking together, animal abuse is a useful indicator of gender-based violence, which is why countries such as the United States, the United Kingdom and Australia have established monitoring protocols to alert authorities to gender-based violence [54].

Finally, an important finding during this study was the modulation of the perception of animal welfare/animal abuse according to the type of extracurricular activity the respondents were engaged in: those engaged in sport were much less sensitive to animal abuse than those engaged in intellectual or creative activities, as shown in Figure 2B, mainly with questions Q21 (1.3 vs. 1.2), Q23 (1.4 vs. 1.1), Q24 (1.5 vs. 1.2) and Q25 (1.5 vs. 1.3). These results reinforce the conclusions obtained after carrying out the Support Macroprocess: art is a potential generator of empathic processes, as it raises people's awareness in a critical way, leading them to reflect on social realities, such as animal abuse, and consequently, to develop responses and solutions [60, 61].

About adolescents, this study has shown a certain general interest in receiving animal welfare education (Q18), with a score of 3.69 ± 1.2. For this reason, we propose the implementation of the PRESMA programme (Prevención Escolar del Maltrato Animal, by its acronym in Spanish; or School Prevention of Animal Abuse, translated into English), aimed primarily at children between 14 and 16 years of age, in which it is proposed to carry out an animal welfare project that contributes to putting into practice their knowledge and skills in this area, as well as reflecting on their treatment of animals [62]. In the end, for humane education to be successful, it must be developed on an emotional level rather than along rational lines.

Regarding to the students of the Faculty of Veterinary Medicine, the analysis revealed a profile of potential perpetrators identical to that obtained in the analysis of adolescents. That is, males without pets with hunting relatives.

As described with adolescents, empathy in veterinary students is again modulated by age and gender, with girls scoring higher in empathy towards animals, a factor already described in other studies [63, 64] and showed in Figure 3A. For questions Q2, Q3, Q9 and Q16, scores were 4.9 vs. 4.7, 4.0 vs. 3.5, 4.8 vs. 4.5 and 4.2 vs. 3.6 for woman and men, respectively ($P < 0.05$ for all cases).

Similarly, sensitivity to animal cruelty was found to increase almost linearly with increasing years of study (Q1= 2.80 vs. 4.00 for first- and fifth-year students, respectively), as perceptions of animal welfare are determined by the level of education and professional practice [65]. However, it is important to note that some studies have found that empathy decreases with increasing years of study. Thus, it has been described that final year students are less able to care for an animal in pain than first year students [63], this reverse pattern could be glimpsed in our study with question Q6: "*Would you treat an abandoned animal close to death for free*", scoring 4.77 and 4.34 for first and fifth year students, respectively. This result finds a possible explanation in compassion fatigue, burnout and the use of detachment to reduce unpleasant emotions [66]. Finally, regarding rural areas, Menor-Campos (2019) describes that in these areas there is a lower level of concern for animal welfare and that students who live in rural environments with hunting relatives are more likely to perform euthanasia on demand, a result that supports the one obtained in our study, where students with hunting relatives were more in agreement [64].

As a solution, we propose to implement intensive courses on animal welfare, as well as the understanding of the work of the veterinarian in denouncing animal abuse throughout the veterinary career to achieve, in this way, a cushion of critical awareness and commitment to animals.

7. CONCLUSIONS

1. The perception of animal welfare is influenced by socio-demographic variables, with the gender being the most important.

2. The profile of the adolescent who seems to be the least sensitive to animal abuse is that of a male who plays sports in his spare time, who do not have a dog, and has family members involved in hunting.

3. Among Veterinary students, sensitivity to animal welfare, including academic training on how to proceed in case of animal abuse, increases as one progresses through one's studies. However, as students approach the end of their studies, they are less willing to make gratuitous efforts.

4. The profile of the Veterinary student who seems to be the least sensitive to animal abuse is that of a male who do not have a dog, live rural habitats and has family members involved in hunting or fishing.

5. To improve the perception of animal welfare, awareness should be raised at an early age, with emphasis on adolescence, promoting artistic activities, encouraging contact with animals and sporting practices that do not generate a lack of empathy for animals.

6. Most of the animal abuse on the island is concentrated at the south, and the main victims are hunting dogs.

7. Mistreated animals are left withs sequalae for the rest of their lives.

8. Most of the owners are likely to have mental health problems, come from structural families and/or substance abuses. In addition, most are unable to recognize their pet abuse.

9. The work of veterinarians as whistle-blowers against abuse is insufficient.

10. Complaints are never completed as they are held up in court.

11. The basis of prevention is comprehensive education at all ages through talks and direct contact with animals.

STUDY LIMITATIONS

Despite the large amount of data obtained from a small population of adolescents, it is important to bear in mind that the respondents were mainly from sparsely urbanized areas, so there is a lack of statistical data from urban children. However, we present this study as a springboard for future research on the adolescent population because of the wealth of data it provides, both from their age group and from previous generations.

ACKNOWLEDGEMENT

The development of this final degree project would not have been possible without the collaboration of several people, including the guidance departments of the high schools surveyed: Laura and María Dolores from IES Teror, and Alexis from CEO Rey Juan Carlos I; the dean of the faculty of Veterinary Medicine at the University of Las Palmas de Gran Canaria, Miguel Batista; as well as the director of the shelter, the veterinarian of one of the protector on the island, and SEPRONA law enforcement officers. My sincere thanks to all those who contributed to this work by sincerely and altruistically completing the survey, especially my colleagues at the Faculty of Veterinary Medicine.

REFERENCES

1. OMSA. *Códigos Sanitarios para los animales terrestres y acuáticos de la Organización Mundial de Sanidad Animal*. 2023 09/01/2023]; Available from: https://www.mapa.gob.es/es/ganaderia/temas/produccion-y-mercados-ganaderos/bienestanimal/.
2. Ruiz-Suarez, N., et al., *Continued implication of the banned pesticides carbofuran and aldicarb in the poisoning of domestic and wild animals of the Canary Islands (Spain).* Sci Total Environ, 2015. **505**: p. 1093-9.
3. Chew, M. and R.M. Armstrong, *Bullfighting in Barcelona.* Med J Aust, 2001. **175**(11-12): p. 573-4.
4. Observatorio_Justicia_y_Defensa_Animal. *Festejos Populares con Animales*. 2015; Available from: https://cdn.20m.es/adj/2015/09/14/3344.pdf.
5. Rial-Berriel, C., et al., *Intensive livestock farming as a major determinant of the exposure to anticoagulant rodenticides in raptors of the Canary Islands (Spain).* Sci Total Environ, 2021. **768**: p. 144386.
6. Rial-Berriel, C., et al., *Epidemiology of Animal Poisonings in the Canary Islands (Spain) during the Period 2014-2021.* Toxics, 2021. **9**(10).
7. Affinity. *Estudio de abandono y adopción 2022*. 2022; Available from: https://www.fundacion-affinity.org/observatorio/infografia-el-nunca-lo-haria-abandono-adopcion-perros-gatos-espana-2022.
8. BOE, *Ley de Protección de los Derechos y el Bienestar de los Animales. Ley 7/2023.* . 2023, Jefatura del Estado (Gobierno de España).
9. ESDAW. *Stray animals by country - Europe*. 2023; Available from: https://www.esdaw.eu/stray-animals-by-country.html.
10. INE. *Tasa de paro de la población. Ambos sexos. Canarias. Todas las edades.* 2022; Available from: https://www.ine.es/consul/serie.do?s=EPA86903.
11. ISTAC. *Personas de 16 o más años sin empleo, disponibles para trabajar y buscando activamente empleo.* 2023; Available from: https://www3.gobiernodecanarias.org/istac/statistical-visualizer/visualizer/data.html?resourceType=indicator&resourceId=POBLACION_PARADA&measure=ABSOLUTE&geo=ES70#visualization/column.
12. INE. *Tasas de paro por distintos grupos de edad, sexo y comunidad autónoma.* 2023; Available from: https://www.ine.es/jaxiT3/Datos.htm?t=4247#!tabs-mapa.
13. INE. *Contabilidad Regional de España (2019-2021)*. 2022; Available from: https://www.ine.es/prensa/cre_2021.pdf.
14. INE. *Encuesta de Población Activa (EPA) y Estadística de Flujos de la Población Activa (EFPA).* 2023; Available from: https://www.ine.es/daco/daco42/daco4211/epa0123.pdf.
15. INE. *Estimación mensual de nacimientos.* 2023; Available from: https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736177079&menu=ultiDatos&idp=1254735573002.
16. INE. *Población por edad (año a año), Españoles/Extranjeros, Sexo y Año. Principales series de población desde 1998.* . 2022; Available from: https://www.ine.es/jaxi/Datos.htm?path=/t20/e245/p08/l0/&file=01003.px.
17. FEDIAF, *90 millones de hogares europeos convivieron con una mascota en 2021.*, in *Animal's Health: el Diario de la Salud Animal.* . 2022, Federación Europea de Alimentación para Animales de Compañía (FEDIAF).
18. ISTAC. *Nacimientos de madres residentes en Canarias.* 2022; Available from: https://www3.gobiernodecanarias.org/istac/statistical-

visualizer/visualizer/data.html?resourceType=indicator&resourceId=NACIMIENTOS&measure=ABSOLUTE&geo=ES70#visualization/table.
19. ISTAC. *Defunciones de residentes en Canarias.* 2021; Available from: https://www3.gobiernodecanarias.org/istac/statistical-visualizer/visualizer/data.html?resourceType=indicator&resourceId=DEFUNCIONES&measure=ABSOLUTE&geo=ES70#visualization/table.
20. Núñez Salinas, F., et al., *La relación del adulto mayor con los animales de compañía en una comuna de Santiago (Chile).* Avances en Ciencias Veterinarias, 2004. **19**(1-2): p. 75-79.
21. ZooCan. *Censos Insulares.* 2023; Available from: https://zoocan.net/Paginas/Censos.aspx.
22. Monzalvo Curriel, A. and N.Y. Torres Soto, *Diseño y validación de la escala de bienestar animal: educación emocional de los niños para prevención del maltrato.* Revista de Comunicación y Salud, 2021. **11**: p. 1-24.
23. Díaz-Videla, M., *Vínculo humano-animal ¿Qué clase de amor es ese?* Calidad de Vida y Salud, 2020. **13**: p. 2-31.
24. AVMA. *Human-animal bond*. 2023; Available from: https://www.avma.org/one-health/human-animal-bond.
25. Collins, G. and J. McNicholas, *A theoretical basis for health benefits of pet ownership: attachment versus psychological support.*, in *Companion animals in human health*, Wilson and Turner, Editors. 1998, Sage (CA): Orlando (FL), USA. p. 105-122.
26. Paul, E.S., *Empathy with Animals and with Humans: Are They Linked?* Anthrozoös, 2000. **13**(4): p. 194-202.
27. Schencke, C. and C. Farcas, *Estudio de la vinculación que tienen los niños y niñas escolares con sus perros y los efectos socioemocionales de este vínculo.* Summa Psicológica UST, 2012. **9**(1): p. 23-32.
28. Galvis Vera, T.Y. and S.F. Robles Sierra, *Actitudes hacia bienestar animal: caracterización de una muestra de niños, adolescentes y adultos de los 11 a 41 años.* 2022, Universidad Autónoma de Bucaramanga: Santander (Colombia). p. 1-37.
29. Goodman, P.E., *The relationship between intimate partner violence and other forms of family and societal violence. .* Emergency Medicine Clinics of America, 2006. **24**: p. 889-903.
30. Bernuz Beneitez, M.J., *El maltrato animal como violencia doméstica y de género. Un análisis sobre las víctimas.* Journal of Victimology, 2015. **2**.
31. DeGue, S. and D. DiLillo, *Is Animal Cruelty a "Red Flag" for Family Violence?: Investigating Co-Occurring Violence Toward Children, Partners, and Pets.* Journal of Interpersonal Violence, 2008. **24**(6): p. 1036-1056.
32. Tallichet, S.E. and C. Hensley, *Rural and Urban Differences in the Commission of Animal Cruelty.* International Journal of Offender Therapy and Comparative Criminology, 2005. **49**(6): p. 711-726.
33. Padawer, A., *El mundo rural y sus técnicas.* 1 ed, ed. C. Saberes. 2020, Buenos Aires (Argentina): Editorial de la Facultad de Filosofía y Letras de la Universidad de Buenos Aires (Argentina). 640.
34. Cazawonke. *España es, tras Francia, el país europeo con más cazadores. .* 2017; Available from: https://cazawonke.com/actualidad/c10-nacional/53530-espana-despues-francia-pais-europeo-mayor-numero-cazadores.
35. Barceló Adrover, A., M. Grimalt Gelabert, and J. Binimelis Sebastian, *Bibliometric analysis of geographical hunting studies in Spain (!978- 2015).* Boletín de la Asociación de Geógrafos Españoles., 2017. **74**: p. 583-588.

36. Herzog, H.A., *Gender Differences in Human–Animal Interactions: A Review.* Anthrozoös, 2007. **20**(1): p. 7-21.
37. Statista. *Número de licencias deportivas de la Federación Española de Caza 2010-2019.* 2020; Available from: https://es.statista.com/estadisticas/1061294/caza-numero-de-federados-en-espana/.
38. Garrido Martín, J.L., *La caza. Sector económico. Valoración por subsectores.* 2012, Real Federación de Caza (FEDENCA). Madrid (España).
39. Affinity. *Estudio "Él nunca lo haría" de la Fundación Affinity sobre el abandono, la pérdida y la adopción de animales de compañía en España 2021: interpretación de los resultados.* 2022; Available from: https://static.fundacion-affinity.org/cdn/farfuture/ZxB9BUhpCCY_I2wJmqJSY-lXO75e5joPoDKpRxNuMso/mtime:1655455698/sites/default/files/white-paper-abandono-2022.pdf.
40. Flynn, C., *Hunting and Illegal Violence Against Humans and Other Animals: Exploring the Relationship.* Society & Animals, 2002. **10**(2): p. 137-154.
41. Teruel, A. *La gran familia en el medio rural.* 2019; Available from: https://web.ua.es/es/dsoc1/documentos/publicaciones-y-recortes-de-prensa/navalon-alba/2019-09-29-la-gran-familia-en-el-medio-rural.pdf.
42. Glatt, N. *La antesala de la violencia social.* 2009; Available from: https://d1wqtxts1xzle7.cloudfront.net/57443756/2_El_Universal_-_Opinion_-_La_antesala_de_la_violencia_social-libre.pdf?1537865428=&response-content-disposition=inline%3B+filename%3DEl_Universal_Opinion_La_antesala_de_la_v.pdf&Expires=1683034107&Signature=Yf8ICO7iwwvxa1kh0ZWvzzMkUgVM3IqrxBxE2ldYNFdWMOXH1Jz-a~i36urepa4-axg3tghzGCUizZVZzwv5bxu5-nHIT~8ZpQoySDyfiXUQvhYt2u-3mI4W13EcJkcUjXYChixLNTlbgFmC9roGAT5VIFWBV1sIzicBdNz6lhSRXhznEylASaRhhAPdGNfgXhEsMLdWMklykItqrtRMsceJtUywpwdlhl9eudjXoJ3m3iA2q1RXdUUBbgFQR-Jr1Hx8DaMHKYfFYyuHEcbSJnlhFp1NZFyjW~FKLsRRQGhQVu3pkoTbHzOTuUcI8sXSQHRb447vEN8Wg9O6INJ~tw__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA.
43. CoPPA. *¿Permitir a los menores de edad participar en actividades de caza? La perspectiva científica de CoPPA.* 2019; Available from: https://coppaprevencion.org/recurso/menores-edad-caza-perspectiva-cientifica/#_ftn1.
44. Graña, J.L., et al., *Effects of viewing videos of bullfights on Spanish children.* Aggressive Behavior, 2004. **30**(1): p. 16-28.
45. Retuerto-Pastor, Á., *Diferencias en empatía en función de las variables género y edad.* Apuntes de Psicología, 2004. **22**(3): p. 323-339.
46. Gómez-Leal, R., et al., *Relationship between emotional intelligence and empathy towards humans and animals.* PeerJ, 2021. **9**: p. e11274.
47. Kronhardt-Scheffer, G., L. Ayres-França, and A.F. da Silva Guedes, *Animal abuse: Profile of the offender, typology of violence and forms of control.* Derecho Animal (Forum of Animal Law Studies), 2021. **12**(1): p. 6-23.
48. Vera-Suárez, A. *Maltrato animal y personalidad: El papel de la Empatía y la Psicopatía.* 2022; Available from: https://riull.ull.es/xmlui/bitstream/handle/915/28023/Maltrato%20Animal%20y%20Personalidad%20El%20Papel%20de%20la%20Empatia%20y%20la%20Psicopatia.pdf?sequence=1.

49. Baron, L., D. Straus Ma Fau - Jaffee, and D. Jaffee, *Legitimate violence, violent attitudes, and rape: a test of the cultural spillover theory.* (0077-8923 (Print)).
50. Roguski, M. *Pets as Pawns: The Co-existence of Animal Cruelty and Family Violence.* 2012; Available from: https://nationallinkcoalition.org/wp-content/uploads/2013/01/DV-PetsAsPawnsNZ.pdf.
51. Febres, J., et al., *Adulthood animal abuse among men arrested for domestic violence.* (1552-8448 (Electronic)).
52. de Santiago Fernández, L., *El maltrato animal desde un punto de vista criminológico.* Derecho y Cambio Social, 2013. **33**: p. 11.
53. Hensley, C., et al., *The Evolving Nature of Prison Argot and Sexual Hierarchies.* The Prison Journal, 2003. **83**(3): p. 289-300.
54. Jordá Sanz, C. and H. Janosch González, *¿Podría ser el maltrato animal un indicador policial de violencia de género? Análisis de casos en España.* Revista Criminalidad, 2023. **64**(3): p. 153-168.
55. Fitzgerald, A., et al., *Development of the Partner's Treatment of Animals Scale.* Anthrozoös, 2016. **29**(4): p. 611-625.
56. Herbert-Garrido, A., *Maltrato animal: las víctimas ocultas de la violencia doméstica.* Derecho Animal (Forum of Animal Law Studies), 2020. **11**(1): p. 14-27.
57. Loring, M.T. and P. Beaudoin, *Battered Women as Coerced Victim-Perpetrators.* Journal of Emotional Abuse, 2001. **2**(1): p. 3-14.
58. Collins, E.A., et al., *A Template Analysis of Intimate Partner Violence Survivors' Experiences of Animal Maltreatment: Implications for Safety Planning and Intervention.* Violence Against Women, 2017. **24**(4): p. 452-476.
59. Vaca-Guzmán, M. *Violencia y maltrato de los animales. Trabajo de Investigación preparado para la Fundación Argentina de Bienestar Animal (FABA).* 2004; Available from: https://colegioabogadosazul.org.ar/webfiles/recursos/VIOLENCIA-Y-MALTRATO-A-LOS-ANIMALES-estudio-para-FABA.docx.
60. Amaya-González, J.A. *Maltrato animal: una respuesta empática de los jóvenes a través del arte.* . 2017; Available from: https://repositorio.ucundinamarca.edu.co/bitstream/handle/20.500.12558/3074/MALTRATO%20ANIMAL%2C%20UNA%20RESPUESTA%20EMP%C3%81TICA%20DE%20LOS%20J%C3%93VENES%20A%20TRAVES%20DEL%20ARTE.pdf?sequence=1&isAllowed=y.
61. Uñó-Batlles, A. *El arte: vehículo para la educación emocional. Una propuesta de intervención.* . 2013; Available from: https://reunir.unir.net/bitstream/handle/123456789/1837/2013_05_27_TFM_ESTUDIO_DEL_TRABAJO.pdf?sequence=1&isAllowed=y.
62. Escorcia Sarmiento, M., *Prevención del maltrato animal a través del desarrollo socio-emocional y la literatura infantil en preescolar*. 2019, Universidad de los Andes.
63. Paul, E.S. and A.L. Podberscek, *Veterinary education and students' attitudes towards animal welfare.* Veterinary Record, 2000. **146**(10): p. 269-272.
64. Menor-Campos, D.J., et al., *Human-Directed Empathy and Attitudes Toward Animal Use: A Survey of Spanish Veterinary Students.* Anthrozoös, 2019. **32**(4): p. 471-487.
65. Mikuš, T., et al. *Opinions towards Companion Animals and Their Welfare: A Survey of Croatian Veterinary Students*. Animals, 2020. **10**, DOI: 10.3390/ani10020199.

66. López-Banchón, D.B., *Fatiga por compasión en el personal médico veterinario de los centros veterinarios ubicados al sur de Guayaquil*, in *Facultad de Medicina Veterinaria*. 2023, Universidad Agraria de Ecuador.