

## ORIGINAL RESEARCH

## Farm animal careers and perception of 'fit' in undergraduate veterinary students: A mixed methods study

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## Abstract

**Background:** Recruitment and retention of farm veterinarians have been the focus of recent research. Previous work suggests that a feeling of 'fit' is important for students to consider a farm career. The aim of this study was to identify whether students feel that they 'fit' in farm practice and reasons for their answer.**Methods:** An online survey was distributed to students at all British and Irish veterinary schools. A mixed methods approach was considered, with thematic analysis on free text answers and regression analysis on demographic variables.**Results:** Thematic analysis identified six themes: career opportunities, nature of farm veterinary work, relationships and interactions, individual experiences, expectations and perceptions, and no perceived barriers. Females, marginalised ethnic groups and those from an urban/suburban background were all identified as having significantly ( $p < 0.05$ ) less agreement with the statement 'I feel able to pursue a career in farm practice'.**Limitations:** Survey limitations include those with a clear bias being likely to respond. However, alignment of the qualitative and quantitative results increased confidence in the findings of this mixed methods approach.**Conclusion:** This study confirms that biases that exist within wider society do have an influence on veterinary undergraduates' intentions to pursue a farm animal career. This is vital to consider both at a university level and when considering students' experiences on placements. Urgent action is required to improve inclusivity in the farm animal veterinary sector.

## KEYWORDS

inclusivity, mixed methods, recruitment, thematic analysis, veterinary education

## INTRODUCTION

Concerns regarding recruitment and retention of farm veterinary practitioners are not a new concept, with forecasting of demand outstripping supply.<sup>1-3</sup> The most recent Royal College of Veterinary Surgeons (RCVS) survey of the profession revealed only 3.2% of practitioners responded that their primary discipline was farm animal practice.<sup>4</sup> While this could be due to the changing landscape of production animal veterinary work (Huxley<sup>5</sup> suggested an increased advisory and preventative herd health approach), it could also be because there are factors influencing new and experienced veterinary sur-

geons' choice to enter (and stay within) the sector. When surveying working farm animal practitioners, appraisals, having family that commercially farm, having support from an experienced colleague while on call and performing more farm work all resulted in increased odds of staying in farm animal practice.<sup>6</sup>

The 'feminisation' of the veterinary profession has continued, with 58% female and 42% male registered veterinary surgeons. This is even more marked when considering more recent graduates: 76% of practising veterinary surgeons are female and 24% are male.<sup>4</sup> In addition, there is the suggestion that veterinary medicine has the largest gender gap of any

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subject grouping.<sup>7</sup> Current figures indicate that the undergraduate population is 80% female.<sup>8</sup> The profession also lacks ethnic diversity; the percentage of 'non-white' veterinary professionals is 3%, whereas 14% of the UK population is 'non-white'.<sup>8</sup> The majority of veterinary practitioners from a marginalised background are also female (61%).<sup>4</sup>

A recent survey looking at discrimination within the veterinary profession identified sex discrimination as the most common form of discrimination (43–44% of incidents), with production animals practice highlighted as an area where this is particularly noted.<sup>8</sup> The next most described form of discrimination was racial discrimination (26–27%); farm animal practice was less frequently cited,<sup>8</sup> perhaps reflecting the low numbers of minority ethnic group practitioners within the farm animal sector. The BVA report on discrimination in the veterinary profession suggested that students may under-report discrimination that they had either experienced or witnessed, with only 19% of incidents being reported.<sup>8</sup> This is supported in work by McCarroll,<sup>9</sup> who found, when surveying clinical veterinary students at the University of Surrey, that 36% of students had either experienced or witnessed discrimination. McCarroll<sup>9</sup> also found the farm animal sector to be the area with the highest cases of incidents reported (38% experienced and 28% witnessed).

Work by Armitage-Chan<sup>10</sup> has suggested that interventions encouraging reflection on identity and reinforcement of the value of relational identity attributes are required. Previous analysis of a survey of UK undergraduate veterinary students, by the authors of this paper, has shown that a 'perception of fit' was an influencing factor in undergraduate veterinary students when considering interest in farm animal veterinary medicine careers.<sup>11</sup> The aim of this study was to analyse a specific quantitative question on this topic and conduct a fresh analysis on a subset of the qualitative data from the original survey to identify whether students feel that they 'fit' in farm practice and reasons for their answer.

## MATERIALS AND METHODS

### Target population and data collection

Original data were collected via an online survey sent to undergraduate veterinary medicine students in October 2018.<sup>11</sup> A full copy of the survey is available in [Supporting Information](#). The survey contained three sections: university (detailed educational history to date), attitudes towards a career in farm animal veterinary practice and demographic information (age, gender, background, social class, ethnicity, religion and nationality). The questions were a mixture of multiple choice, 'select all that apply' and free text. A mixed methods approach was used, with quantitative data used to understand which student populations felt like they may or may not fit, and qualitative analysis to understand the reasoning behind this. This was performed using the third section of the survey

(demographics, page 4 onwards in [Supporting Information](#))—with quantitative and qualitative analysis performed on the question 'Taking into account the demographic information you have provided, to what extent do you agree with the following statement: I feel able to pursue a career in farm practice' (Likert scale and free text).

## Data analysis

### Quantitative data

Following the questions regarding demographic information in the questionnaire, respondents were asked 'Taking into account the demographic information you have provided above, to what extent do you agree with the following statement: I feel able to pursue a career in farm practice'. Responses were provided on a five-point Likert-style item with options ranging from 'strongly disagree' to 'strongly agree'. Responses were explored and visualised using bar charts in Microsoft Excel.

Responses were analysed using a multivariable approach to account for confounding caused by respondents' intersecting identities. A linear regression model, a logistic model comparing agreement versus no agreement and an ordinal logistic regression model were specified in R.<sup>12</sup> Although the data were not by definition continuous, as is common with large samples of ordinal data in linear models, model fit was good and there were no changes to the interpretation when comparing model parameters between the linear, logistic or multinomial models.<sup>12,13</sup> For simplicity and ease of interpretation, only the linear model is described here.

The linear model took the form:

$$y_i = \beta_{0i} + \beta_{1i}x_{1i} + \beta_{2i}x_{2i} + \beta_{3i}x_{3i} + \dots + \beta_{ji}x_{ji} + e_i$$

where  $y$  is the level of agreement with the statement 'I feel able to pursue a career in farm practice',  $i$  is the student identifier,  $\beta_{0i}$  is the model intercept,  $\beta_{1i} - \beta_{ji}$  are the regression coefficients,  $x_{1i} - x_{ji}$  are the explanatory variables and  $e_i$  are the residuals. A  $p$ -value of less than 0.05 was considered statistically significant. The model was specified using forward selection, all variables were offered to the model sequentially and retained where one of the categories was statistically significant. Variables offered to the model are shown in Table 1.

### Qualitative data

Thematic analysis was performed on the free text responses to the question 'Taking into account the demographic information you have provided above, to what extent do you agree with the following question: I feel able to pursue a career in farm animal practice. Please explain your answer'. Initial coding was performed by a third-year, white, female veterinary

**TABLE 1** Variables offered to a regression model with the outcome being veterinary students' stated level of agreement with the statement 'I feel able to pursue a career in farm animal practice'

Variable	Description
Gender	Female, male, another gender identity, prefer not to say
Ethnicity	white, Asian/Asian British, black/African/Caribbean/black British, mixed/multiple ethnic groups, other
Socioeconomic group	Based on National Readership Survey <sup>14</sup> household socioeconomic groups (ABC1, C2DE), plus aristocracy/socialite, and prefer not to say
Background	From a farm/farming community, from a rural area but not a farming community, from an urban or suburban area, prefer not to say
Religion	No religion, Buddhism, Christianity, Hinduism, Islam, Judaism, Sikhism, prefer not to say, other
Nationality	Entered as free text, coded by researchers as 'UK and Republic of Ireland', 'rest of Europe', 'North America', 'rest of world'
Year of study	Preliminary/gateway/year 0, year 1, year 2, year 3, year 4, year 5/6, intercalating
Veterinary school attended	University of Bristol, University of Cambridge, University College Dublin, University of Edinburgh, University of Glasgow, University of Liverpool, University of Nottingham, Royal Veterinary College, University of Surrey, other

student (EM) using NVIVO 12 Pro (QSR International, Melbourne, Australia), with a subset of responses double coded by a white, male farm veterinary surgeon working in academia (JR) to ensure reliability. An inductive approach was considered following the six steps outlined in the study by Braun and Clarke.<sup>15</sup> The final framework was discussed and refined in a group meeting among the authors (EP, JR and EM).

## RESULTS

In total, 1146 responses were obtained and used for analysis. This was estimated to be an approximately 20% response rate based on numbers of undergraduate students estimated at the time.<sup>16</sup> There were respondents from all UK and Irish veterinary schools (at the time) and all years of study.<sup>11</sup> The number of respondents within each demographic group are shown in Table 2.

## Quantitative

### Descriptive data

Model parameters from the linear regression model are shown in Table 2. There were significant associations between agreement with the statement 'I feel able to pursue a career in farm practice' and respondent gender, ethnicity, background, school, nationality

and socioeconomic group. There were no significant associations between level of agreement and respondent religion or year of study. Respondents identifying as female had, on average, lower agreement than those identifying as male ( $p < 0.001$ ). Respondents from a farm or rural background had higher levels of agreement than those from an urban or suburban background ( $p < 0.001$ ). Respondents considering their household as upper class had lower agreement than those from a higher managerial or professional background, and this was the only socioeconomic group with significantly different levels of agreement to higher managerial or professional households. The ethnicity demographic groups had the largest differences in levels of agreement between groups. Respondents identifying as having black and Asian ethnicity had lower levels of agreement than respondents identifying as having white ethnicity ( $p = 0.007$ ,  $p < 0.001$ , respectively). Respondents from outside of the UK, Ireland, Europe and North America had lower agreement than British or Irish students ( $p < 0.001$ ). Students from European countries outside of the UK and Republic of Ireland were less like to agree ( $p = 0.04$ ). There were small differences in agreement between respondents from different veterinary schools, with the University of Edinburgh being statistically significantly different from the baseline (Royal Veterinary College).

## Qualitative

Thematic analysis identified six themes as follows: career opportunities, nature of farm veterinary work, relationships and interactions, individual experiences, expectations and perceptions and no perceived barriers. A summary of themes and subthemes is displayed in Figure 1.

### Career opportunities

This theme was identified from respondents' understanding of career progress, pathways and availability within the farm animal sector and whether or not the career choice was suited to them as an individual. Often comparisons to other disciplines were made:

I feel I could probably pursue the career if I really wanted to, but think it would be more difficult than other paths without any real additional benefits compared to other options, e.g., small animal (#816, third year).

Home location was a barrier frequently expressed by respondents, particularly those from outside the UK, when considering future career planning:

I am able to pursue a career in farm practice; however, will there be opportunities for me where I live in the future. Since I

**TABLE 2** Parameters for a linear regression model of veterinary students' level of agreement with the statement 'I feel able to pursue a career in farm practice', where 1 = strongly disagree and 5 = strongly agree

Characteristic (N = 1146)	N	Coefficient	95% confidence interval	p-Value
<b>Gender</b>				
Male	165	–	–	
Female	977	–0.27	–0.42, –0.12	<0.001
Another gender identity	3	0.83	–0.16, 1.8	0.1
Prefer not to say	1	2.1	–0.42, 4.6	0.1
<b>Ethnicity</b>				
White	1004	–	–	
Asian/Asian British	71	–0.52	–0.81, –0.22	<0.001
Black/African/ Caribbean/black British	6	–1	–1.7, –0.27	0.007
Mixed/multiple ethnic groups	45	–0.23	–0.49, 0.04	0.092
Other	9	–0.46	–1.0, 0.12	0.12
No answer	11	–0.87	–1.4, –0.33	0.002
<b>Background</b>				
From a farm/farming community	178	–	–	
From a rural area but not a farming community	437	–0.37	–0.53, –0.21	<0.001
From an urban or suburban area	529	–0.72	–0.88, –0.56	<0.001
No answer	2	–1.6	–3.4, 0.09	0.063
<b>School</b>				
Royal Veterinary College	274	–	–	
University College Dublin	28	–0.13	–0.47, 0.22	0.5
University of Bristol	140	0.03	–0.15, 0.21	0.7
University of Cambridge	46	0.12	–0.15, 0.40	0.4
University of Edinburgh	156	0.19	0.02, 0.36	0.031
University of Glasgow	93	–0.05	–0.26, 0.16	0.7
University of Liverpool	132	0.18	–0.01, 0.37	0.058
University of Nottingham	168	–0.03	–0.20, 0.14	0.8
University of Surrey	108	–0.01	–0.21, 0.18	0.9
No answer	1	0.3	–1.4, 2.0	0.7
<b>Nationality</b>				
UK and Ireland	912	–	–	
North America	120	–0.15	–0.34, 0.03	0.11
Rest of world	56	–0.69	–1.0, –0.36	<0.001
Rest of Europe	28	–0.35	–0.68, –0.02	0.04
No answer	30	–0.21	–0.55, 0.12	0.2
<b>National Readership Survey socioeconomic group</b>				
ABC1	857	–	–	
Aristocratic	6	–0.88	–1.6, –0.18	0.014
C2DE	220	–0.04	–0.17, 0.09	0.6
No answer	63	–0.1	–0.32, 0.13	0.4

Note: A positive coefficient indicates the demographic group had, on average, a higher level of agreement, and a negative coefficient indicated the demographic group had, on average, a lower level of agreement with the statement.

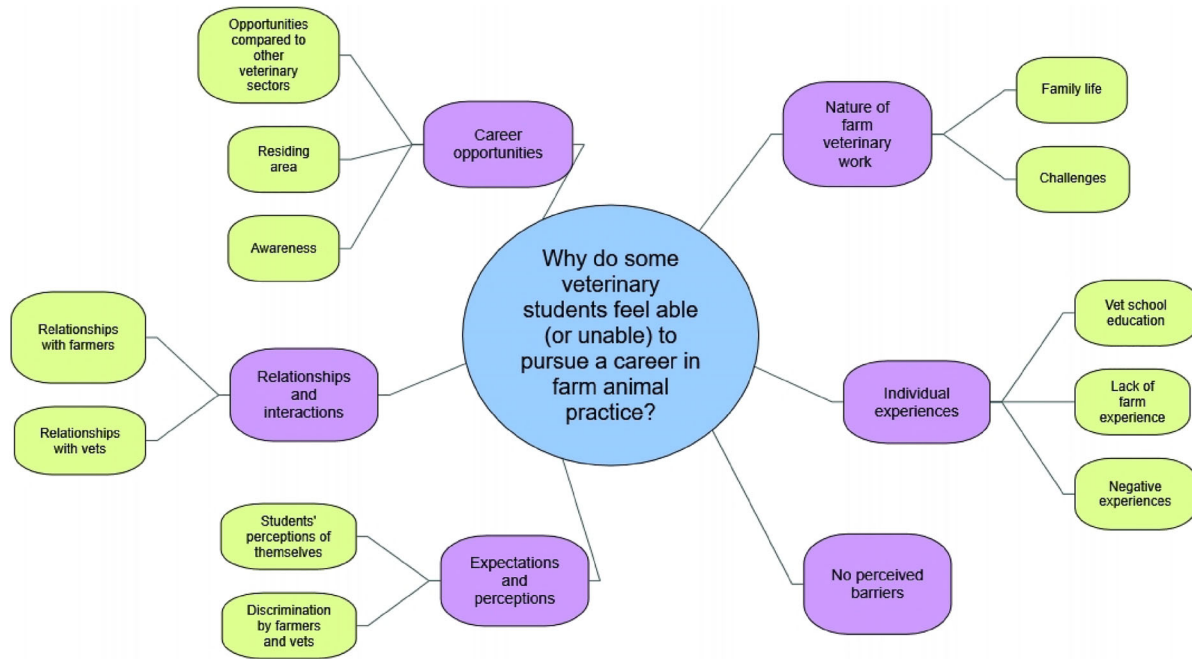
am not sure what's going to happen, I don't know whether or not I will be able to be a farm vet even if I wanted to do that practice (#1004, second year).

Within this theme, there was also a feeling of resilience regarding career choice and that individual motivation is the only barrier preventing students

from undertaking a professional role within farm animal practice:

I wouldn't let my background stop me from wanting to pursue a certain career. If you want something you can work towards it and through any adversity (#466, fourth year).





**FIGURE 1** Coding tree displaying themes identified by thematic analysis

### Nature of farm veterinary work

This theme relates to aspects of the job itself creating challenges. Respondents were concerned about health implications (mental and physical) and their safety on-farm:

I don't feel suited to farm work as I lack the stamina and strength for a lot of procedures and I do not feel safe in the presence of farm animals and on farms in general (#584, fifth/sixth year).

Aspects surrounding salary, working hours/on-call, support, the working environment, etc. were also mentioned:

My concerns encompass finding a practice that has reasonable hours, salary and kind coworkers (#354, fourth year).

In addition, there was concern related to the above factors, specifically when considering a family and children, particularly concerns surrounding pregnancy:

A long-term concern is that large animal practice does not appear to facilitate women starting a family (in terms of working hours, maternity leave, safety during pregnancy, etc.), but this would not prevent me trying to start a career in farm (#227, second year).

Finally, personal beliefs and lifestyle decisions were identified as a barrier within this theme, including religious beliefs, dietary choices and industry objections:

I think it is attainable, but due to being a minority ethnic and also my religion not believing in taking an animal's life—unless to end suffering—it can also be conflicting (#519, second year).

I feel I am able to pursue a career in farm practice but I would not be able to reconcile my beliefs as a vet and animal welfare with doing so (#87, fifth/sixth year).

I've heard from numerous people that they don't trust vets who haven't been in the field for long/don't have a background in the field. I've also heard farmers say they wouldn't trust non-meat eating vets, so that further limits my options (#900, second year).

### Relationships and interactions

The relationships and interactions theme includes the influence of existing and perceived relationships between farmers, vets and students on a student's decision to enter farm animal practice. In particular, communicating with farmers was identified as a barrier:

I don't feel confident having conversations with farmers about their farms as I feel like I am lacking a lot of knowledge from not growing up on a farm (#551, fourth year).

As well as this, lack of contacts within the industry was a perceived barrier:

I don't know many farmers at the moment (as I live inner-city) but I'm hoping this changes over the course of vet school. I feel it is as much 'who you know' as it is 'what you know' to get into farm practice (#220, first year).

## Individual experiences

This theme encompassed student education, farming experience and interactions (observed and participated). These were related to confidence and actual events that had occurred or been witnessed. Education within the vet school was identified as a barrier by some respondents:

Teaching is based heavily around small animals at university so there are gaps in my confidence to go straight into farm practice (#262, fifth/sixth year).

Barriers also included negative experiences. These were related to respondents being discouraged from pursuing a farm career, gender discrimination, racial discrimination, financial constraints and background influencing career choice. There were also limited role models/mentor figures available:

Fellow (male) vet students have made (joking) comments that my size and sex will mean I can't do it (#146, second year).

Sometimes I think being a woman and of mixed heritage is difficult. Not that I couldn't be a good farm vet, but I'm not sure I could deal with farmers potentially making comments in the way I've already experienced (although most farmers don't mean it in a horrible way at all! They can just say ignorant things without realising (#443, third year).

I have personally never met or been taught by a farm vet who isn't white (#1130, third year).

## Expectations and perceptions

The expectations and perceptions theme refers to how respondents felt they are viewed by farmers and veterinary surgeons, including factors for which they felt disadvantaged or discriminated against in a farm setting. Self-perception was often referred to when considering confidence, comparing themselves to others and individual preference (for a career in another discipline).

Self-confidence and comparing themselves to others was often linked to background and whether or not the respondent had been raised with a farming background:

I feel I have a vast gap in knowledge in terms of general agriculture in comparison to colleagues who are from a farming background, and I am concerned I will be seen as a worse vet/not as interested/harder to approach or build relationships with farmers when I graduate and look for farm animal jobs (#419, fourth year).

Numerous responses referred to discrimination by both farmers and veterinary surgeons. These were related to age, gender, size, strength, sexuality and non-farming background.

I think that barriers do exist in the farming community, especially with regard to females and females of colour. I have never been subject to outright sexism or racism but there are undertones that I have witnessed and small comments/microaggressions that are part of my decision to not go into farm practice (#487, third year).

I have often felt that as a city-dwelling female with a 'posh' accent assumptions are made by a certain group of farmers and farm vets while on placement. Not by all of them, but by enough to put me off a career with those people (#163, fifth/sixth year).

## No perceived barriers

The final theme identified was from those respondents who did not feel there were any barriers preventing them from entering a career in farm animal practice. The following quotes are both from students who were not part of a minority group:

I do not feel that there would be any reason I would not be able to work with farm animals—other than personal preference (#65, second year).

I don't think there are many barriers to entry for me (#161, third year).

The theme encompasses the idea that respondents perceive barriers to be specific to themselves as individuals rather than societal.

## DISCUSSION

This study identifies that some demographic groups within the undergraduate veterinary student population feel less able to pursue a farm animal career. Females, marginalised ethnic groups, those with an urban/suburban background and aristocratic respondents were all identified as having less agreement with the statement 'I feel able to pursue a career in farm

practice'. Thematic analysis of participants' free text responses related to this statement when considering their answers to the demographic questions identified six themes: career opportunities, nature of farm veterinary work, relationships and interactions, individual experiences, expectations and perceptions, and no perceived barriers.

Gender bias, the physical nature of the farm veterinary job and challenges surrounding pregnancy/starting a family all featured heavily within the free text analysis. Within career opportunities, the location, career progression and lack of part time options all echo Adam et al.'s<sup>17</sup> study of vets who remained in or had left farm animal practice; the concept of 'compatibility' is discussed. The feeling of lack of compatibility ('fit') is echoed within the undergraduate population. It was not uncommon for respondents to be anticipating returning to their home location, and geographically this was perceived as a barrier. Given the parallels between these concerns within the undergraduate population and those described by experienced vets,<sup>17</sup> addressing these issues remains important for both recruitment and retention. The health and safety implications of pregnant farm veterinary surgeons is not something new to the industry, with a comprehensive risk analysis approach discussed in the study by Lovatt and Mitchell.<sup>18</sup> Given the increasing number of female farm vets, interest surrounding this theme has gained momentum, with the British Cattle Veterinary Association featuring slots within their conferences and podcasts offering specific advice for female farm veterinarians; however, there is still much progression to be made.

Within the relationships and interactions theme, the connection with other veterinary surgeons is alluded to, and within the experience theme respondents discuss being discouraged by others. Role models are respected, motivating veterinary surgeons<sup>19</sup>; within human medicine, 'positive surgical role models' have been identified as an influencing factor for junior doctors when considering a career in surgery.<sup>20</sup> There does appear to be a conscious movement within the farm veterinary sector and wider agricultural sectors to increase awareness around widening acceptance of differing career choices, with initiatives such as 'Women in dairy'.<sup>21</sup> However, the lack of ethnic diversity of role models is still apparent, as demonstrated by the quote above from respondent #1130. Religion and nationality are often used as an explanation to attempt to justify a lack of racial diversity; however, even when taking these into account, marginalised ethnicity students still had lower agreement with the statement 'I feel able to pursue a career in farm animal practice'.

This paper supports the BVA report on discrimination in the veterinary profession<sup>8</sup> and confirms that discrimination is a barrier to undergraduates when considering a career in the farm animal veterinary sector. It supports the findings that discrimination occurs throughout the veterinary profession (including at an undergraduate level) and indicates that discrimina-

tion can come from multiple sources: fellow students, veterinary surgeons and clients. In addition, there is also an anticipation of being discriminated against. Respondents' reasons for experiencing, witnessing or anticipating discrimination included gender, race, nationality, pregnancy, physical ability (stature and strength) and accent.<sup>8</sup> These results support the suggestions in Begeny et al.<sup>2</sup> that the way individuals are considered at work has a direct influence on confidence in that individual's abilities and wider career aspirations. It also supports conclusions surrounding farm animal work being less appealing to minority ethnic groups.<sup>22</sup> Within the no barriers perceived theme, there is an implied perception that either there is no need to change or that not overcoming perceived barriers is a personal failing. The perfectionism trait within the veterinary undergraduate population has been studied with links between this and 'agreeableness' which could, in itself, be part of the issue.<sup>23</sup>

Some of these findings, while unpleasant, will not be a surprise to people with regular contact and discussion with veterinary students. The researchers would encourage readers to engage with, and listen to, the concerns and experiences described by students and qualified vets, especially those from underrepresented groups. Nearly 20 years ago, Neal<sup>24</sup> discussed the need to 'encourage a broader, multiculturally inclusive, re-imagining of English rural landscapes'. Listening, believing and learning from the experiences and encounters students have been exposed to and described within this paper is a clear starting point. Further education is required throughout all aspects of the profession and associated industries to ensure that this is no longer a feature of the farm animal veterinary sector.

Limitations of surveys, particularly free text responses, include that those with a clear bias are more likely to respond. However, in this case, there was an extremely high take up of the opportunity to express opinions and share experience via free text, suggesting this is a highly emotive topic that all respondents feel strongly about. A reflexive approach was considered for the thematic analysis, and it is possible that the themes established by a third-year, white, female veterinary student and a white, male academic vet may differ from those established by researchers from different backgrounds; however, confidence in these findings is increased by their alignment with the quantitative results. It is acknowledged that, for some of the demographic groups discussed, there are a small number of respondents; this is taken into account by the statistical analysis.

This study confirms that biases that exist within wider society do have an influence on veterinary undergraduates' intentions to pursue a farm animal career, with some groups of students being made to feel that they do not 'fit'. These barriers help to fuel issues pertaining to recruitment and retention within the farm animal veterinary sector. Urgent action is required to address this and improve inclusivity in the farm animal veterinary sector. As a profession, we should be promoting acceptance, openness and

an inclusive, diverse and accessible population of role models for our undergraduate to aspire to emulate.

## AUTHOR CONTRIBUTIONS

Emily Payne conceived and designed the analysis; collected the data; performed data analysis; wrote the paper. Emily Morten and Christopher Lally performed data analysis. John Remnant conceived and designed the analysis; collected the data; performed data analysis; performed the multivariate analysis; revision of completed manuscript. All authors reviewed the manuscript before submission.

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## CONFLICTS OF INTEREST

The authors declare they have no conflicts of interest.

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## DATA AVAILABILITY STATEMENT


Research data are not shared due to participant confidentiality.

## ETHICS STATEMENT

The study was approved by the School of Veterinary Medicine and Science ethical review committee (reference 2409 180620 UG) and the survey was piloted on six undergraduate students.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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