

ORIGINAL RESEARCH

Attitudes of UK veterinary students towards careers in the production animal sector: A mixed methods approach

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Abstract

Background: Within the production animal sector, it has long been forecast that demand for veterinary services could outstrip supply. This study aims to identify factors influencing veterinary undergraduates' attitudes towards a career in farm animal veterinary practice and how those factors may be influenced by their experiences during their time as an undergraduate.

Methods: An online survey was distributed to all vet schools in the UK and Ireland. Thematic analysis and descriptive data analysis were performed on the 1146 responses received.

Results: Seven themes were identified: relationships, preferences and interest, fit, direct experience, fear, ethics and values and lifestyle. When considering first job choice, extra mural studies (EMS) and personal interest (60% and 75% of respondents respectively) were very influential. Factors that appeal or put off respondents from a career in farm animal varied dependent on anticipated first job ($p < 0.001$), but working hours and out of hours were consistently identified as barriers.

Conclusion: The results highlight the importance of EMS being more transparent about the profession and using the opportunity to discuss undergraduate concerns regarding farm animal practice.

KEYWORDS

mixed methods, recruitment, thematic analysis, veterinary education

INTRODUCTION

Retention of veterinary surgeons across disciplines has been identified as an area of concern within the profession.^{1,2} Specifically considering production animal practice, Lowe³ predicted that demand may outstrip future supply of farm animal veterinary practitioners. In the UK, only 5% of practicing veterinary surgeons spend 100% of their time working in production animal practice⁴ and an increasing number of veterinary surgeons undertaking mixed species jobs post-graduation progress to no longer carrying out production animal work.^{3,5}

A recent survey of academic staff and graduates describes universities' obligation to provide graduates that are 'fit to practise'; however graduates working with farm animals responded that they felt less prepared for diagnostic reasoning, veterinary public health and zoonotic issues and self-reflection and work life-balance than their small animal and mixed practice counterparts.⁶ The role of a farm animal practitioner can be more difficult to define than their

companion animal equivalent – giving individual and herd level care and considering both the food chain and business enterprises.⁷ The changing landscape in the agricultural industry, and farm veterinarians' role within that, should be accounted for within undergraduate training.⁸ In addition to the challenging industry, the concept of a new generation of graduates has been proposed; 'millennials' educated through the digital age, have different lifestyle aspirations that fit less well with traditional veterinary practice and may aspire to a more diverse career.⁹ They place value on individual aspects of their jobs, to have grounded expectations of salary and first jobs but aspire to progressing quickly and advancing skills, all while maintaining a good work-life balance.¹⁰ This generation has now been replaced as the undergraduate cohort with 'generation Z', known for their abilities with modern technology and self-directed learning but sometimes considered to be lacking critical thinking abilities.¹¹ It is also important to note that some authors dispute this 'generational archetypes' approach.¹²

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Despite these changes to the profession, university places remain competitive, and retention within undergraduate courses is high.¹³ In the UK, all veterinary schools follow omnipotent curricula¹⁴ resulting in all graduates having the skills to pursue a career in any sector. While it is clear that retention post-graduation is an issue, to the authors' knowledge, data on veterinary undergraduate attitudes towards farm animal careers are currently limited. A better understanding of student attitudes will be essential in understanding and influencing the supply of future farm animal veterinary surgeons.

The aims of this study were to identify factors influencing undergraduates' attitudes towards a career in farm animal veterinary practice and how those factors may be influenced by their experiences during their time as an undergraduate.

METHODS

Target population and data collection

An online survey (Online Surveys, Jisc, Bristol, UK) was distributed by email to undergraduate students at each veterinary school in the United Kingdom and Republic of Ireland. The survey was available for 4 weeks in October 2018 with a prize draw as a participation incentive. The survey contained a combination of questions exploring undergraduates' attitudes towards a career in farm animal practice and what has influenced this (see supplementary material). The questionnaire comprised of three sections:

1. University – multiple choice questions relating to university of attendance, year of study and previous higher education history
2. Attitudes towards farm animal practice – a combination of multiple choice, select all that apply and free text questions. These covered experience and interest in a career with farm animals prior to vet school and at the time of answering; anticipated first job and what has influenced this; what appeals/put respondents off a career in farm animal practice; most positive and negative on farm/farm careers experience and enjoyment of farm animal teaching
3. Demographics – multiple choice and free text questions regarding gender, age, background, social class, ethnicity, religion, nationality and whether this influenced ability to pursue a career in farm animal practice

Ethical approval (2409 180620 UG) was granted by the University of Nottingham School of Veterinary Medicine and Science before the survey was released, and a pilot was run on six undergraduate students.

Data analysis

Responses were stored, and analysis of quantitative data was performed in Microsoft Excel (Microsoft

Corporation, Washington). Bar charts were used to visualise distribution of responses to multiple choice questions (GraphPad Prism V8.4.3, GraphPad Software, CA, USA). A chi-square test was used to test for differences in categorical responses between respondents who anticipated their first jobs to include farm animal work and those who did not with $p < 0.05$ considered statistically significant.

An inductive approach was taken to analyse the qualitative data. Free text response rates were high with 92.3% of recipients ($n = 1058$) responding to one or more question. Thematic analysis was used to analyse free text responses following the method described by Braun and Clarke.¹⁵ The process of establishing themes included data familiarisation (active reading of all responses), initial coding, identifying themes, revision of themes, theme definition and naming of themes and report production.¹⁵ Coding was carried out manually by the first author (Emily Payne) using NVIVO 12 Pro (QSR International Pty Ltd, Melbourne, Australia). A subset of free text responses was double coded by a further two of the authors (Kate Cobb and John Remnant; using NVIVO 12 Pro) to maximise reliability, and any differences were resolved by discussion.

RESULTS

Quantitative and descriptive analysis

A total of 1146 responses were obtained, and all responses were included in the analysis. There are approximately 5300 students currently studying veterinary medicine in the UK,⁴ although this is likely a slight underestimate (this reference only included veterinary schools with completed RCVS accreditation at the time of publication), in which case this equates to an approximately 20% response rate. There were respondents from all participating universities, and years of study with more descriptive data displayed in Table 1.

Regardless of anticipated discipline(s) upon graduation, personal interest and extra-mural studies (EMS) were most commonly selected (75% and 60% of respondents, Figure 1) in answer to the following question: 'Which, if any, of the following factors influenced first job expectation?' (Survey question 8b; which followed questions around expected first job discipline). Although trends appeared similar, when considering only those respondents anticipating a first job involving farm animals, previous work experience was also prominent ($p = 0.023$). When asked to choose factors that appeal about a career in farm animal practice, respondents anticipating a career either in mixed practice or with no farm animals followed a similar pattern (working outside, varied day and working with farm animals), those that anticipate a farm only first job also chose working with farm animals but also significantly working with farmers/within the agricultural industry ($p = <0.001$). Conversely, when considering factors that put respondents off a career in farm animal, those who anticipated a first job in

TABLE 1 Participant information

Variable	Respondents <i>n</i> = 1146 (% of the total)
School of graduation	
University of Bristol	140 (12.2)
University of Cambridge ^a	46 (4.0)
University College Dublin ^a	28 (2.4)
University of Edinburgh	156 (13.6)
University of Glasgow	93 (8.1)
University of Liverpool	132 (11.5)
University of Nottingham	168 (14.7)
Royal Veterinary College	274 (23.9)
University of Surrey	108 (9.4)
No response	1 (0.1)
Year of study	
1	197 (17.2)
2	218 (19.0)
3	247 (21.6)
4	268 (23.4)
5/6	203 (17.6)
Intercalating/Preliminary ^b	12 (1.0)
No response	1 (0.1)
First degree	
Yes	876 (76.4)
No	269 (23.5)
No response	1 (0.1)
Age	
18–21	574 (50.1)
22–25	454 (39.6)
26–30	87 (7.6)
>30	29 (2.5)
Prefer not to say	1 (0.1)
No response	1 (0.1)
Gender	
Male	165 (14.4)
Female	977 (85.3)
Self-defined	3 (0.3)
Prefer not to say	1 (0.1)
Background	
From a farm/farming community	178 (15.5)
From a rural area but not a farming community	437 (38.1)
From an urban/suburban area	529 (46.2)
Prefer not to say	1 (0.1)
No response	2 (0.2)
Experience with farm animals prior to starting vet school	
None/limited	498 (43.4)
Intermittent	346 (30.2)
Regular	172 (15.0)

(Continues)

TABLE 1 (Continued)

Variable	Respondents <i>n</i> = 1146 (% of the total)
Extensive	129 (11.3)
No response	1 (0.1)

^aUniversity of Cambridge distributed the survey to clinical years only; University College Dublin distributed the survey to the final 5/6 year only.

^bPreliminary year is for students with non-traditional A levels and backgrounds and studied before entering the main veterinary programme; intercalated refers to incorporating additional year(s) of study during the veterinary degree to study on another programme, for example a BSc or MSc.

farm animal only or mixed chose salary and out of hours/working hours. Those who anticipated no farm animal work in their first job showed a statistically different response ($p = <0.001$) also choosing out of hours/working hours but in addition to this, working conditions and working with farmers/within the agricultural industry (Figure 2).

Qualitative analysis

Thematic analysis generated seven major themes relating to decision making regarding farm animal practice: relationships, preferences and interest, fit, direct experience, fear, ethics and values and lifestyle (Figure 3). The identified themes are described with illustrative quotes below. Quote identification follows the format individual respondent number (#), survey question, year of study.

Relationships

The relationships theme referred to the bond between the farmer and veterinary surgeon that the respondent expected to establish or had observed:

'I enjoy the relationship you can build up with farming clients as opposed to seeing so many small animal clients in 1 day and not remembering them' #367, Q8c, 5/6th year

As well as situations that had arisen by 'word of mouth' that is, veterinary surgeon to undergraduate, undergraduate to undergraduate etc:

'A lot of vets I have been with on ems do not enjoy it and have warned me against it. Especially with certain farms which they dread going to more than awkward small animal clients...' #164, Q22, 3rd year

This theme evolved to encompass the bond that can be formed between farm animal veterinarians and clients due to regular contact in both a positive and

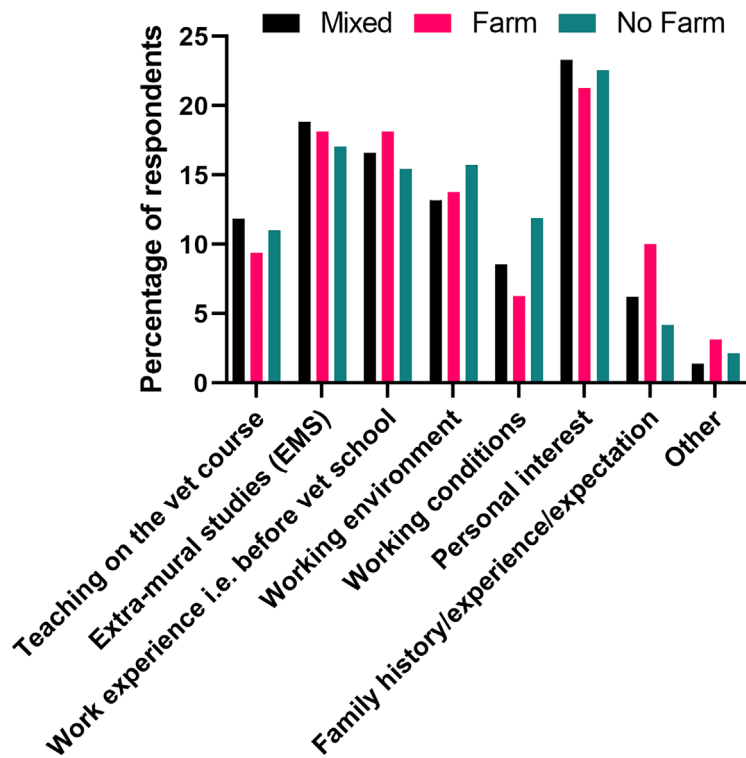


FIGURE 1 Bar chart displaying percentage responses to factors influencing expected first job, sorted by anticipated first job when surveying undergraduate veterinary students ($n = 1146$)

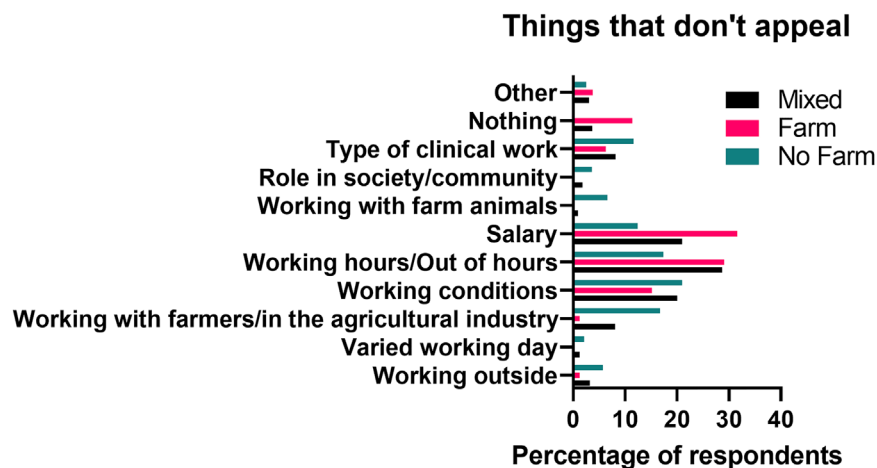
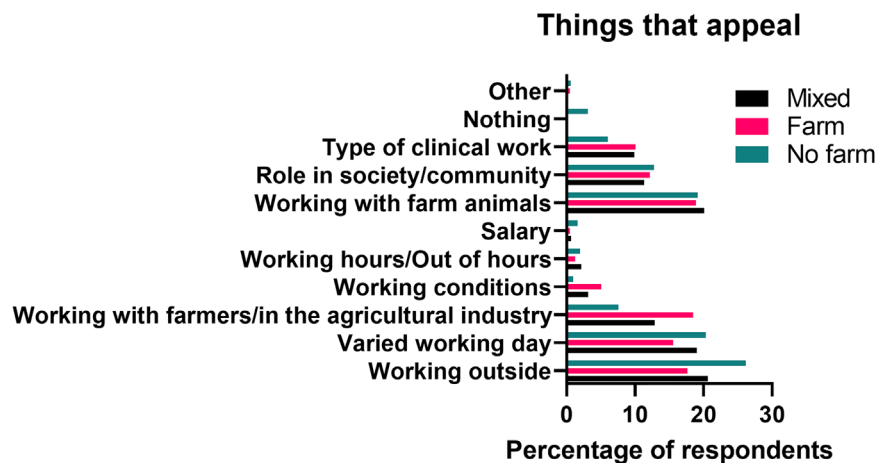


FIGURE 2 Bar chart displaying percentage responses to factors that put respondents of a career in farm animal, sorted by anticipated first job, when surveying undergraduate veterinary students ($n = 1146$)



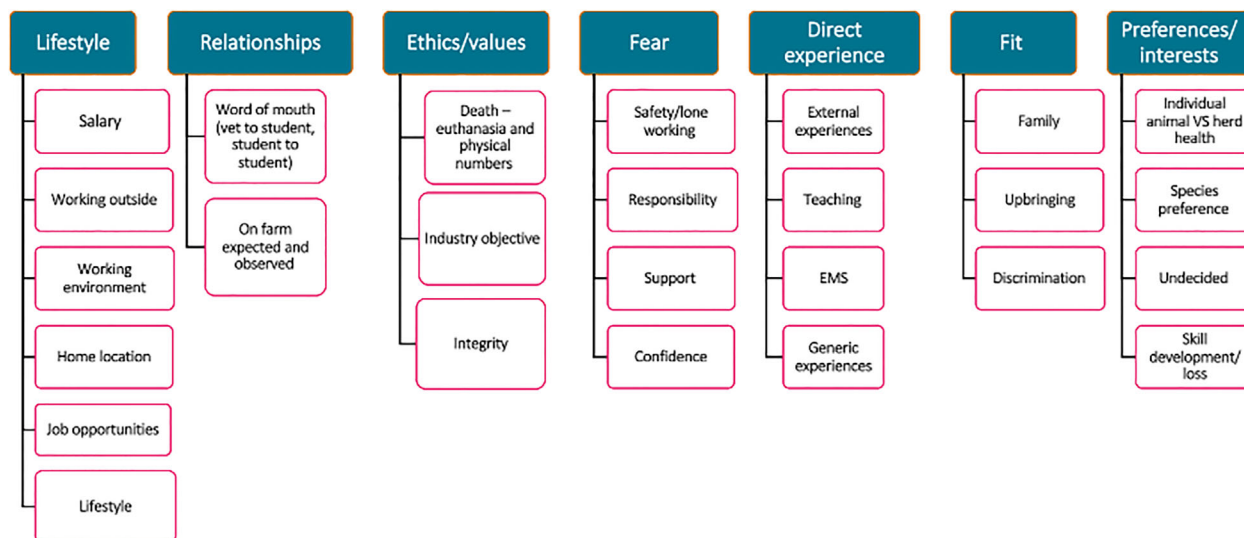


FIGURE 3 Coding tree displaying the seven themes and subthemes identified by thematic analysis

negative light. The relationships theme emerged from both direct communication that had already occurred and from a perceived communication that respondents imagined would happen in their future careers. Relationships, as a theme, explored different aspects of individual's communication, personal expectations and the influence of another's opinion.

Preferences and interest

This theme encompassed the elements of personal choice, a predilection towards, or away from, working with a certain species:

'I just have no interest in farm animals.'
#315, Q8c, 5/6th year

'I really like working with cows and sheep.'
#990, Q8c, 3rd year

In addition to this it described a feeling of using farm animal practice as a stepping-stone to other disciplines or to prevent not using/losing certain skills having completed an omnipotential course:

'As I have been at vet school I still do not know which animals I want to work with so I am considering mixed practice to keep my job prospects more open after graduation. I am also leaning towards wildlife so experience with mixed practice would probably best prepare me for that.' #55, Q8c, 2nd year

From a lot of respondents there was a general feeling of reluctance to focus on one discipline. Worry about not further developing skills and knowledge throughout the course were expressed, at the same time as not really wanting a true mixed job. In addition to this the concept of herd health and individual animal medicine were very polarising:

'I love that you have to look at things holistically. It is not just the animal that you are treating, but the entire farm, including herd health, farm management, etc.' #178, Q12, 3rd year

'I like individual medicine much more than herd health.' #1056, Q11a, 5/6th year.

Perception of fit

Fit, when used as a verb, describes being adapted to and suitability (in this case for a job role), and the 'fit' theme encompasses statements about respondents perception of their own suitability for working in farm animal practice. This theme also encompassed aspects of discrimination, including but not limited to: gender, pregnancy and starting a family, physical stature, lifestyle choices and being from a farming background or not. This theme evolved with an overriding sense of lack of fit, all though this was not wholly the case.

'I feel as though it is harder for women to go into Farm Animal Practice, particularly if you are not born into that background. Also, in a practical sense, I feel it would be easier to have children if you are doing small animal work. You could work for longer during pregnancy.' #583, Q8c, 1st year

'Sometimes farmers have commented on lack of height or strength when on EMS with the vet. It is a concern of mine if I do go into mixed practice.' #976, Q13, 5/6th year

'I think there is a big misconception in the vet community that farmers do not like female vets. I have never had any problems

with being female in the farming community. I actually think there is more in the small animal community especially when a male vet student is seen as a vet but a female vet student is seen as a nurse.' #242, Q22, 5/6th year.

Direct experience

This theme encompassed attitudes related to respondents own experience in the agricultural sector for example references to EMS (including costs of this and difficulties sourcing placements), teaching within the undergraduate degree, external experiences (part time jobs, travelling, young farmers clubs etc.) and had a very heavy and polarising influence on respondents' decision-making regarding career choice. Although asked directly about experiences, respondents often expressed emotions relating to their enjoyment or dislikes rather than descriptive comments of events.

'I really enjoyed lambing as it was very hands on and confirmed my desire to pursue a career in farm veterinary. I really enjoyed the constant challenges that came with the experience.' #91, Q12, 1st year

'I would really like to follow a career in mixed practice, but I feel a bit let down by both my university and EMS providers. The teaching staff are really great, but we do not have enough of an opportunity to do clinical work with farm animals. The only way to see real farm animal practice is on EMS. However, any mixed clinic I have attended had vets who were on the road all day and never came back to pick me up/left very early in the morning. I have never even seen a C-section being done, and I am in final year! I had not the money for a car or to go somewhere fancy (i.e., far away/abroad) that did farm animal surgery in-house.' #334, Q13, 5/6th year

Fear

This theme describes factors related to the individual, such as concerns regarding their confidence and ability on farm, the support they would receive from colleagues upon graduation, the responsibility of moving to making economic decisions that livelihoods relied on (rather than the more traditional caring role used for companion animal) and fears around on farm safety and lone working. This theme emerged from often emotional responses, demonstrated in the example below with the use of the word 'intimidating' when discussing out of hours (traditionally a time where support would be less readily available). The

first respondent below alluded to support they would seemingly expect or want in a job, a lack of support emerged from this theme:

'Seeing practice with vets that do not seem supportive of their new graduates. Seeing practice on farms with poor facilities so that carrying out the tasks is verging on dangerous.' #226, Q13, 5/6th year

'The possibility of being a new vet and being on call and possibly be called out in the middle of the night to do a caesarean or etc. is very intimidating and I cannot see myself being confident enough to be okay with that.' #125, Q22, 4th year

Ethics and values

This theme was identified from respondents sharing opinions around the farming and agricultural industry in general; sometimes questioning the integrity of the industry and the veterinary professions' involvement; including concerns about animal welfare in agriculture:

The culture that exists in some areas, where more senior vets may encourage inappropriate clinical actions of younger vets, in order to attempt to protect a client's business, relationship with a practice or finances. That is, putting the integrity of the profession on the line, for the sake of keeping the client, such as through the seemingly common practices of ignoring certain withdrawals, some aspects of welfare, and the ability to prevent certain conditions. #530, Q13, 5/6th year

'I find there is such a conflict of keeping the animals welfare high and fulfilling the demands of the farming industry. I do not understand how you can keep an animal's welfare as your highest priority when you are actively putting them through elective procedures against their welfare purely for human benefit.' #87, Q13, 5/6th year

However, this theme was not entirely negative, with an emergence of the idea of using the role as a farm animal practitioner to improve the production animal industry:

'Ability to make some difference towards driving the food industry's welfare and productivity forward, while supporting the rural economy.' #530, Q10a, 5/6th year

In addition to this reference to death evolved, both in terms of methods and euthanasia and physical numbers, were commonly made. Direct comparisons with other disciplines held the production animal industry in a negative light:

'It can be tougher than working with small animals, higher rates of death or death over treatment' #176, Q13, 1st year.

Lifestyle

Lifestyle as a theme encompasses responses regarding more day-to-day aspects of farm veterinary work – for example perceived salary, working outside, the working environment (farms, car etc.), perceived hours and stability/variability of the working day.

'Out of hours in freezing conditions. Being told that the salary for farm vets is not as good as for smallies or equine' #1029, Q13, 4th year

'Although small animal work is perhaps the easier option in terms of better work/life balance, farm practice is a way of life and one I am considering entering into. Plus I do not mind the OOH' #648, 8c, 4th year

In addition to this home location and availability of jobs, rather than species of animal, emerged:

'Working in mixed practice initially gives me the best chance of finding a job as soon as I graduate - most likely it will be somewhere near a major town or city' #800, Q8c, 2nd year

'I would be willing to move anywhere necessary to pursue a career in farm animal practice.' #277, Q22, 2nd year.

DISCUSSION

The aims of this study were to identify factors influencing undergraduates' attitudes towards a career in farm animal veterinary practice and how those factors may be influenced by their experiences during their time as an undergraduate. Seven themes have been identified that influence undergraduates' attitudes towards a farm animal career: relationships, preference and interest, fit, direct experience, fear, ethics and values and lifestyle. Personal preference or interest, experiences on EMS (both clinical and pre-clinical) and working conditions (species of animal, hours, outside, salary and variety) were the most common factors influencing desire to work in farm practice.

EMS influenced choice of anticipated first job very highly (Figure 1) and free text responses related to both animal husbandry EMS and clinical EMS largely shaped the direct experience theme. These responses featured very prominently, this is not unexpected as respondents were directly asked both their most positive and negative farm careers-related experience.

For the 43.4% of students that described themselves as having limited or no experience with farm animals prior to starting veterinary school (Table 1) EMS may be one of the only opportunities they have had to explore the farm animal veterinary medicine avenue. This is supported in Baguley¹⁶ when 37% of surveyed final year students found EMS of most value for obtaining insight into career options. Preparation for EMS (by the student) has been identified as key to a successful placement¹⁷; however, it is also acknowledged that teaching animal handling to students in a university setting requires considerable staffing, time, amenities and suitable animals.¹⁸ Expectations must be managed for both parties (practicing veterinary surgeon, undergraduate on placement). Variability of quality of EMS has been identified as a concern.¹⁹ Broadly speaking, EMS aims to allow undergraduates to experience as many of the facets of veterinary medicine possible, from the basics of animal handling to expertise in routine procedures and upholding the values of the veterinary profession within a workplace setting.²⁰ The direct study theme refers to some of the difficulties surrounding EMS from a student perspective. This is supported by the RCVS considering multiple options to reform EMS as a result of issues surrounding quality assurance (relative lack of structure and trained mentorship), sourcing and financing placements. Suggestions include earlier clinical placements, one large placement at the end of undergraduate teaching (to facilitate transition to the professional development phase), allowing clinical and non-clinical EMS to be performed alongside one another and including externships within the core curriculum.²⁰ These ideas have presented to the profession, but no clear outcomes have yet been revealed, although support for EMS to allow experiential learning is still supported by the profession.¹⁹ Clearly from this study EMS experiences are very polarising with regard to future career choice and therefore implementing some of these changes could help make a more uniform and informative experience for all students. EMS is likely to remain an important part of the undergraduate course; and with increasing student numbers and consolidation of practices this is something that should be monitored within the profession going forward.

Salary and working hours/out of hours were two of the three most commonly chosen factors that do not appeal to students anticipating their first job including some/all farm practice. These were reflected within the construction of the lifestyle and fear themes. When considering the negative connotations with salary and working hours, this differs from a similar recent survey of practising veterinary surgeons (rather than

undergraduates) that looked at retention within the profession where salary and working hours were not found to predict retention⁵; this could possibly be explained by undergraduates and farm practitioners having different perceptions of working conditions. However, when considering retention in the veterinary profession as a whole, Vet Futures describe a 'lesser endorsement of long hours within the work culture' and 'burnout' as factors contributing to contemplating leaving the profession¹ and the BVA 'voice of the profession' survey revealing that 25% of members (across the profession) felt that working hours were a reason their working life had not met their expectations.²¹ The most recent RCVS study of the profession revealed the average sole farm animal vet works 42.7 h a week plus 23 h on call, this is more than the small animal counterpart and considerably less than the equine equivalent.²²

Vet Futures (a project developed to uphold and advance veterinary standards) also identified a sense of 'fit' as a predictor for retention,¹ and this same theme was identified within the current study. Largely comments within this study related to the protected characteristics however, there was also a subtheme of being from a farming background. A study of gateway and first year students at RVC found that having a family member or friend in farming was the ninth most popular reason for wanting to become a vet.²³ This is supported within this study and demonstrated within the relationships theme. While it is very difficult to alter an individual's direct experience, it is possible to be more transparent with the messages that are being sent out to prospective farm animal graduates. Further exploration of the evolution of these themes is warranted and could help to further understand where the developed themes derived from and how to improve information around careers coming from veterinary surgeons who may be influenced by personal experience or out of date information.

There was some concern regarding post-graduate support and lone working identified within the fear theme. This is not a new concern, and a theory for lack of support within mixed roles leading to attrition of recently qualified farm animal practitioners has been proposed, named 'the spiral of disillusionment'.²⁴ This details the notion that a new graduate who wants to enter farm practice (but is not confident enough to solely work as a farm veterinarian) takes a mixed job where their working day consists mainly of small animal consultations and they only do farm animal work when on call. This inevitably leads to a bad experience which knocks their confidence further, and they drift into small animal work because it feels easier and is what they feel more comfortable with. Recent suggestions to help improve job satisfaction and encourage career flexibility include providing undergraduates and recently graduated practitioners with 'career roadmaps'.²⁵

Although there were a large number of respondents to the survey, care must be taken when generalising the findings to wider populations. While the

triangulation of the qualitative and quantitative data increases confidence, there remain some limitations. A potential challenge with mixed method surveys is that they lack rich and detailed analysis due to the limited data accessible.²⁶ In this study, there were no character restrictions in place for answering the free text questions throughout the survey, and the authors received large volumes of free text from respondents, with respondents often volunteering much more information than the question directly asked and articulating freely how the experiences informed and influenced their career decisions. Researcher subjectivity could be considered a limitation of this type of research. It is possible that the themes drawn by the primary author as a female farm vet relatively early on in her career may be different to those of a male practitioner nearing the end of their career. However there is some argument considering this a resource rather than limitation when a reflexive approach is taken, as in this case.²⁷ Nevertheless, the results of this study provide useful insights to inform strategies to ensure a sustainable farm animal veterinary sector.


CONCLUSIONS


Provision and retention of veterinary surgeons within the profession, particularly production animals, is an issue with many different influencers. It is clear from this study that there are key factors influencing undergraduate choice of discipline. EMS presents an excellent opportunity for veterinary surgeons to open discussion around undergraduate concerns (hours, salary, lone working, support etc) and to reassure students that, with positive experiences and up to date information on the working conditions in the sector, newly qualified graduates can succeed in the farm animal sector.

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SUPPORTING INFORMATION

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

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