

Survey of students' experiences of bovine externships

***Philippa Gibbons**, BVetMed(Hons), MS, DACVIM(LA), PGDipVetEd, MRCVS;
Jennifer Koziol, DVM, MS, DACT; **Arn Anderson**, DVM, DABVP

School of Veterinary Medicine, Texas Tech University, Amarillo, Texas 79106
Corresponding author: Dr. Philippa Gibbons, pgibbons@ttu.edu

Abstract

Externships are an important adjunct aspect of veterinary students' learning experiences to refine and improve technical skills, experience other areas of practice and to meet potential employers. Externships are highly variable in requirement by the veterinary schools and may overlap with rotations in a distributive model program. In efforts to better understand externship experiences of clinical year, student members of the American Association of Bovine Practitioners were asked to respond to a survey detailing up to 2 bovine externships that they had undertaken. Students answered questions regarding the practice itself, skills they performed and how the externship was structured. Seventy-five students from 33 institutions completed details for 1 externship, with 19 students completing information for 2 externships. The most frequent sector of the bovine industry experienced was cow-calf followed by dairy. Overall top skills that were performed included history taking, transrectal palpation, transrectal ultrasound, physical examination and left displaced abomasal surgeries. The survey revealed key insights into students' externship expectations in bovine practice, including their reasons for participation, skills gained, and externship structure. Students from distributive model schools reported externships with more structure primarily in receiving orientation. The findings emphasize the importance of designing externships that meet both student learning needs and practice goals, benefiting both students and practitioners.

Key words: bovine, externship, veterinary education

Introduction

Externships, also known as preceptorships, clerkships or extramural studies, are a key component of veterinary education. Their primary purpose is to provide students with real-world experiences that may not be available within veterinary schools. Externships encompass a range of settings, including private practices (both general and referral), industry and government. In the U.K., externships (referred to as extramural studies) are part of a structured program mandated by the Royal College of Veterinary Surgeons, requiring 30 weeks – 10 weeks focused on animal husbandry and 20 weeks on clinical practice. Of the clinical experiences, 60% should be in general practice.¹ In North America, veterinary schools have varying requirements for externships, with the number of weeks ranging from zero to 15 (personal communications, American Association of Bovine Practitioners [AABP] Faculty Representative Listserve). Additionally, distributive model programs places students in private practices which have agreed to provide highly structured real-world experiences. These experiences overlap with externships.^{2,3} Despite the importance of externships in veterinary education, there is limited published literature on their

structure or outcomes. One study found that mixed animal practitioners felt externships prepared them more effectively for practice than teaching hospital rotations.⁴ The level of oversight from veterinary institutions varies; some require placements to be approved by the school, while others have minimal oversight.⁵ Previous literature suggests that reasons for undertaking externships include experiencing different types of practices or industries, developing specific skills and potential job interviews.⁶ Currently, day-one competencies for students in bovine practice in North America have not been published, although numerous studies have explored the skills required for bovine practitioners in their daily practice.⁷⁻¹⁰ In contrast, day-one competencies for equine practice have been published by the American Association of Equine Practitioners,¹¹ swine competencies by the American Association of Swine Veterinarians,¹² and day-one skills for farm animals are available in the U.K.¹³ These competencies can guide a student's learning experience during an externship and assist in preparing them for day-one readiness. Anecdotal evidence suggests that students' experiences with externships can be highly variable. For example, a study from the U.K. reported that 36% of students experienced some form of discrimination,¹⁴ highlighting the importance of institutional oversight to promote student well-being. Given the current climate of veterinarian attrition, utilizing externships as potential job interviews is important from both the student's and the practice's perspectives. Therefore, it is crucial for practices to establish successful externship programs that provide valuable experiences. Key factors for successful externships include proper preparation by both the practice and the student, clear expectations, development of a learning contract, orientation and feedback.¹⁵

The aim of this survey was to report on the types of externships undertaken by AABP student members, their reasons for completing these externships, the skills they performed, the structure of the externships, and their overall experiences.

Materials and methods

Clinical year students at veterinary institutions in North America who had undertaken at least 1 externship in bovine practice were recruited to participate in a 95-question online survey. Clinical year students were recruited through targeted email of AABP student members who met our inclusion criteria (AABP total student membership is 1,000 members with 249 students meeting inclusion criteria at the time of this survey). Students could answer the questions for two externships. Questions included details of length and type of externship, the type of practice, who they interacted with during the externship, how feedback was delivered, housing and compensation, competencies, and skills they observed or participated in, and negative and positive experiences during the externship. Descriptive data analyses were performed. The study

was approved by the Institutional Review Board of Texas Tech University. Students were given the opportunity to enter a raffle for a pair of Uddertech coveralls at the end of the survey with a stated odd of winning of 1:50. The survey instrument can be found in Appendix 1.

Data analysis

Data from the survey was transferred to Microsoft Excel and descriptive and statistical analysis performed within the program. Students were grouped into hospital or distributive programs. The sector of the industry they experienced was grouped into beef (included cow-calf, stocker, feedlot), dairy (included dairy and heifer raiser) and both (had at least 1 of each areas). Data were analyzed in R programming (R, 2023) version 4.3.0 by creating contingency tables to analyze independence between training type and variables of interest. A fisher's exact test for independence was performed on all covariates of interest using the `fisher.test` function from the "stats" package against veterinary training type (hospital vs. distributed training). Continuous variables (expenses and number of externships) were compared to previous training style using `aov` function in base R programming. Both continuous variables were log transformed to meet the assumption of normality when comparing with training type.

Results

Seventy-five students from 33 institutions completed details for 1 externship, with 19 students providing information for 2 externships. The average number of externships completed was 5, with a range of 1-14. Students did not have to answer every question; therefore, the denominator for the following results varies. In the externships described, 15/96 externships reported an experience that was primarily observational, of which only one had a rotation that was solely observational. Fisher exact test of independence of the surveyed results between students from traditional teaching hospital programs and distributive schools reported a lack of evidence for independence. Prior training style was as likely to report supervision vs. observation style externship training. Students from distributed training reported more externships in the survey ($P < 0.02$) compared to students from hospital training.

Ninety percent of students completing the survey were from traditional teaching hospital programs. The most frequently reported primary reason for undertaking the externship was to improve technical skills, followed by gaining knowledge, future employment opportunities, experiencing a particular area of practice, and fulfilling a program requirement. The most frequently reported reasons for choosing a practice for the externship were the species ratio (percentage of bovine), followed by location, type of practice (beef/dairy, etc.), housing provided, positive student feedback, recommendations by a DVM or faculty member, and employment opportunities. Only 1 student reported receiving a stipend.

Seventy-one out of 96 students had housing provided, most frequently an apartment at the clinic or with a clinic employee. The cost of the externship that students reported ranged from \$0 to \$2,000, with an average of \$324.06. There was no evidence on training type and expenses reported on the survey among 4th year veterinary students ($P=0.75$). Seventeen students received a grant or scholarship from either their veterinary school or the AABP Foundation. Of those not receiving a grant or scholarship, 19/76 (25.0%) were unaware that this was an option.

Structure of externships

The most frequently experienced sector of the bovine industry was cow-calf, followed by dairy (Figure 1). Table 1 displays the state or province in which the externship was undertaken. Regarding good practices for the structure of externships, only 16.2% of teaching hospital students received a formal orientation, compared to 66.7% of distributive program students. Similarly, only 31.5% of teaching hospital students completed a document stating their goals for the externship, compared to 72.7% of distributive model students. Fisher exact test of independence between hospital type and completion of documents prior to externship showed that there was evidence of independence between hospital type $P = 0.04$. Students from distributed training were more likely to report prior completion of documents compared to hospital trained students. Fisher exact test for independence between hospital training type and orientation showed that they were independent $P = < 0.01$. Students in hospital training were more likely to report no orientation at externships compared to distributed trained students. Additionally, 70.2% (59/84) of students reported being on call. Students reported working a range of 10-80 hours per week.

Skills and competencies performed during externships

Overall top skills that were performed included history taking, transrectal palpation, transrectal ultrasound, physical examination and left displaced abomasal (LDA) surgeries. Figures 2-8 displays competencies that were performed by students in each category.

Feedback

Overall, 83.7% of responding students reported receiving some form of feedback. When asked when they received feedback, students reported that it was most often given ad hoc (48.9%, 44/90), followed by at the end (34.4%, 31/90), at the end of each week (8.9%, 8/90), and halfway through (7.8%, 7/90). The majority of students received only positive feedback (44.4%, 40/90), with 32.2% (29/90) receiving both positive and negative feedback, and only 1 student reported receiving only negative feedback. Only 25.6% (22/86) of students were asked if they wanted to receive feedback before it was given. Fisher exact test for independence between program type and feedback showed a lack of evidence of independence; $p = 0.35$ and Fisher exact test for independence between hospital training type and asking for permission prior to receiving feedback also resulted in a lack of independence, meaning there was a lack of evidence for a difference between students in distributive or traditional teaching hospital programs. Overall, 69.8% (60/86) of both teaching hospital and distributive program students received a grade for their externship. Fisher exact test for Independence between hospital training type and receiving a grade showed evidence of independence $p = 0.03$. Distributed trained students were more likely to report being graded compared to hospital trained students.

Figure 1: Sectors of the cattle industry experienced by clinical year students during externships and the percentage that each sector was experienced during externships.

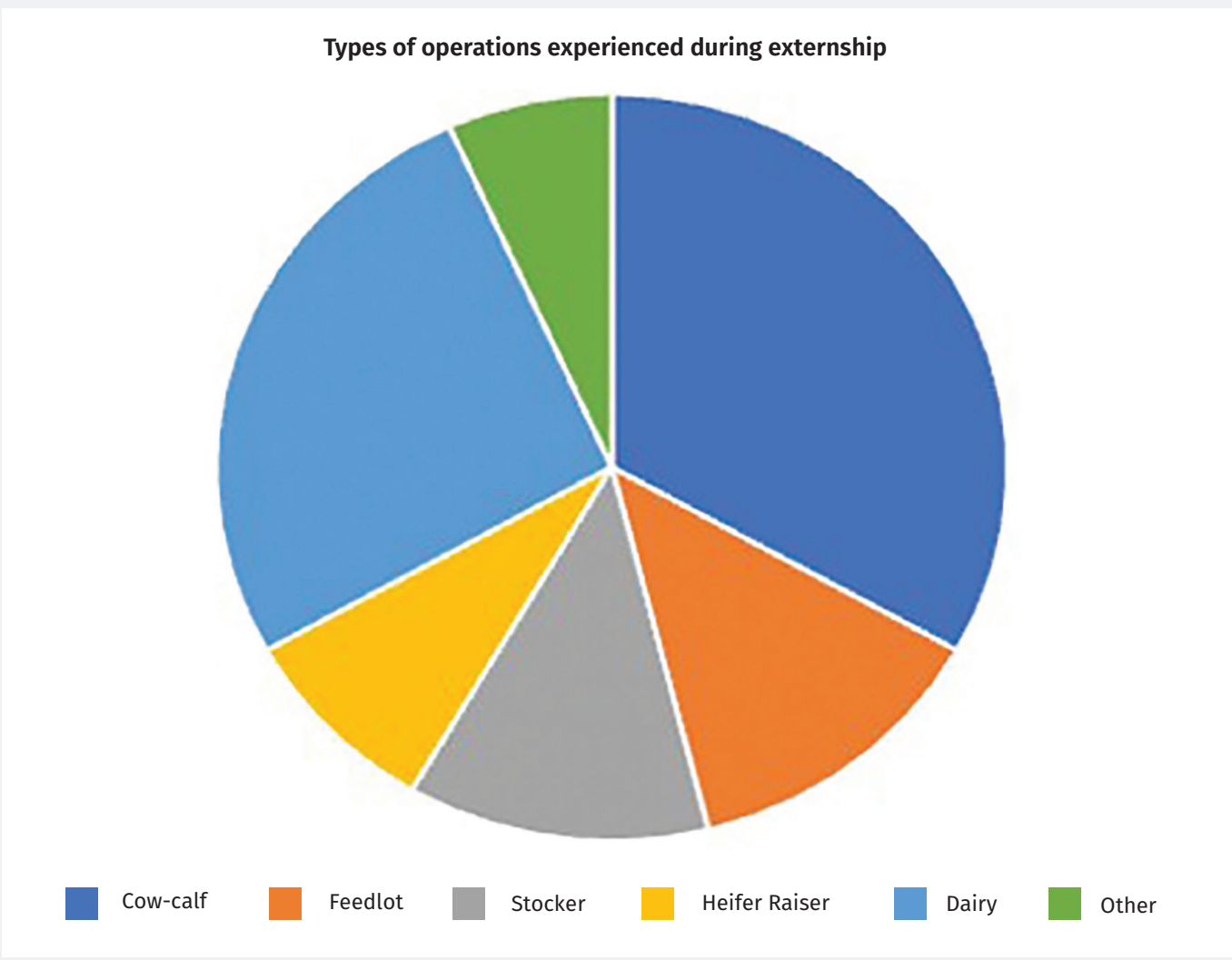


Table 1: U.S. states and Canadian province showing how many externship experiences were reported.

State/Province	Number of Externships
Alberta	5
Alabama	1
Arizona	5
Arkansas	1
California	13
Colorado	1
Idaho	3
Indiana	2
Iowa	2
Kansas	3
Kentucky	2
Michigan	3
Minnesota	1
Mississippi	1
Missouri	4
Montana	3
Nebraska	2
New York	2
North Carolina	1
North Dakota	3
Ohio	2
Oklahoma	3
Oregon	1
Pennsylvania	1
Puerto Rico	1
South Dakota	1
Tennessee	4

Figure 2: Number of students and types of communication competencies performed by students during their externship.

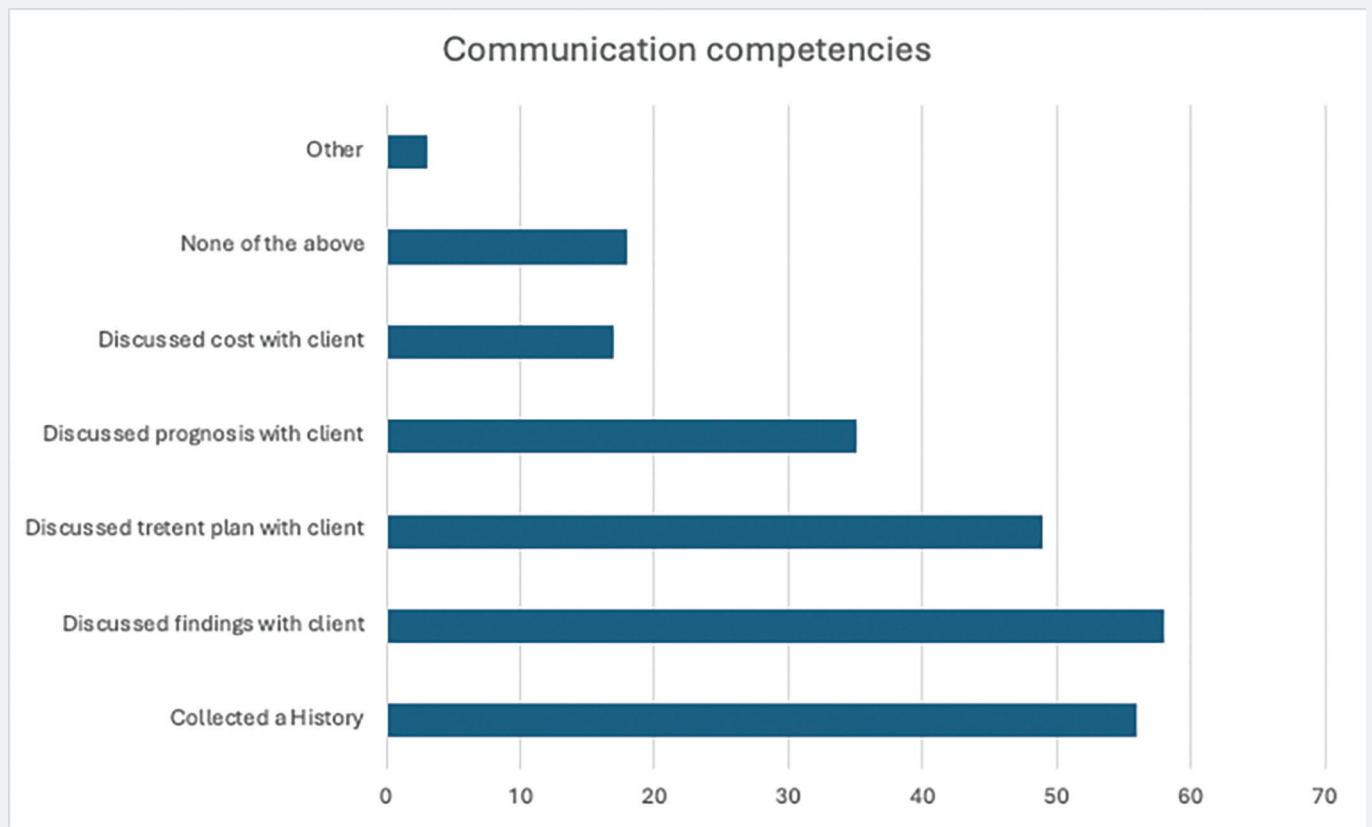


Figure 3: Number of students and type of diagnostic competencies performed by students during their externship.

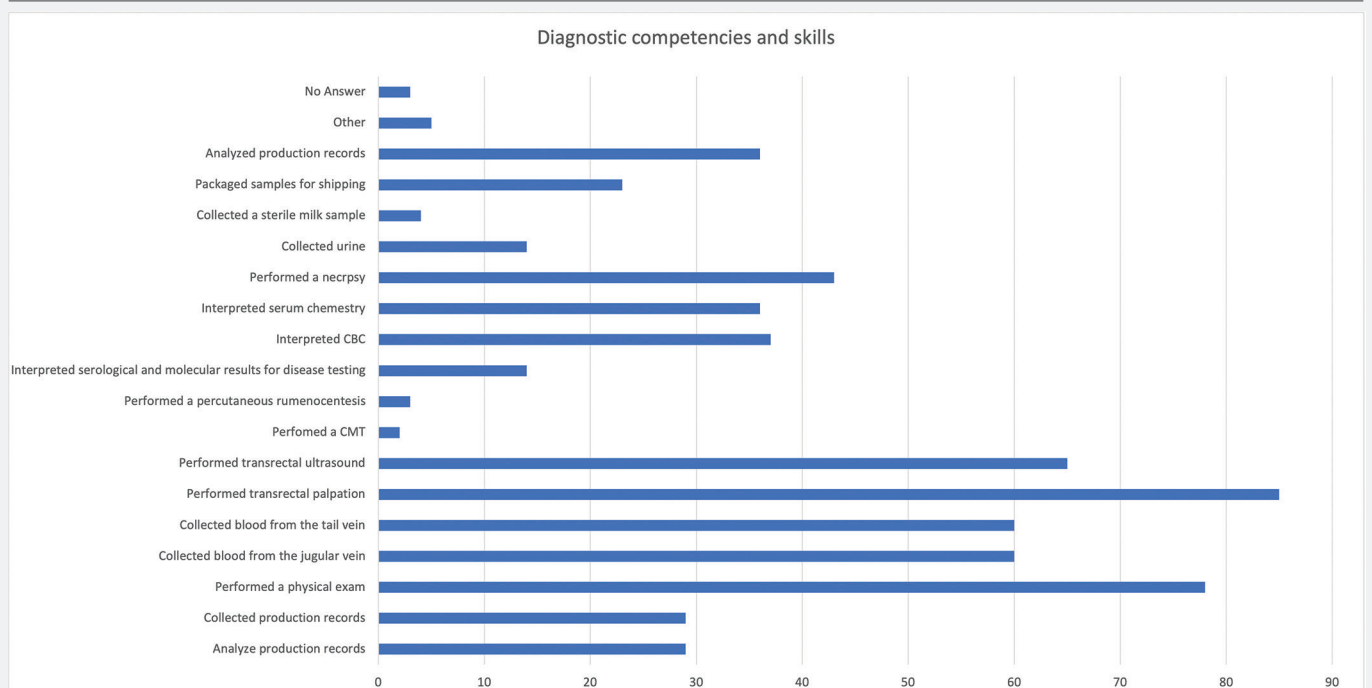


Figure 4: Number of students and types performing routine management competencies during their externship.

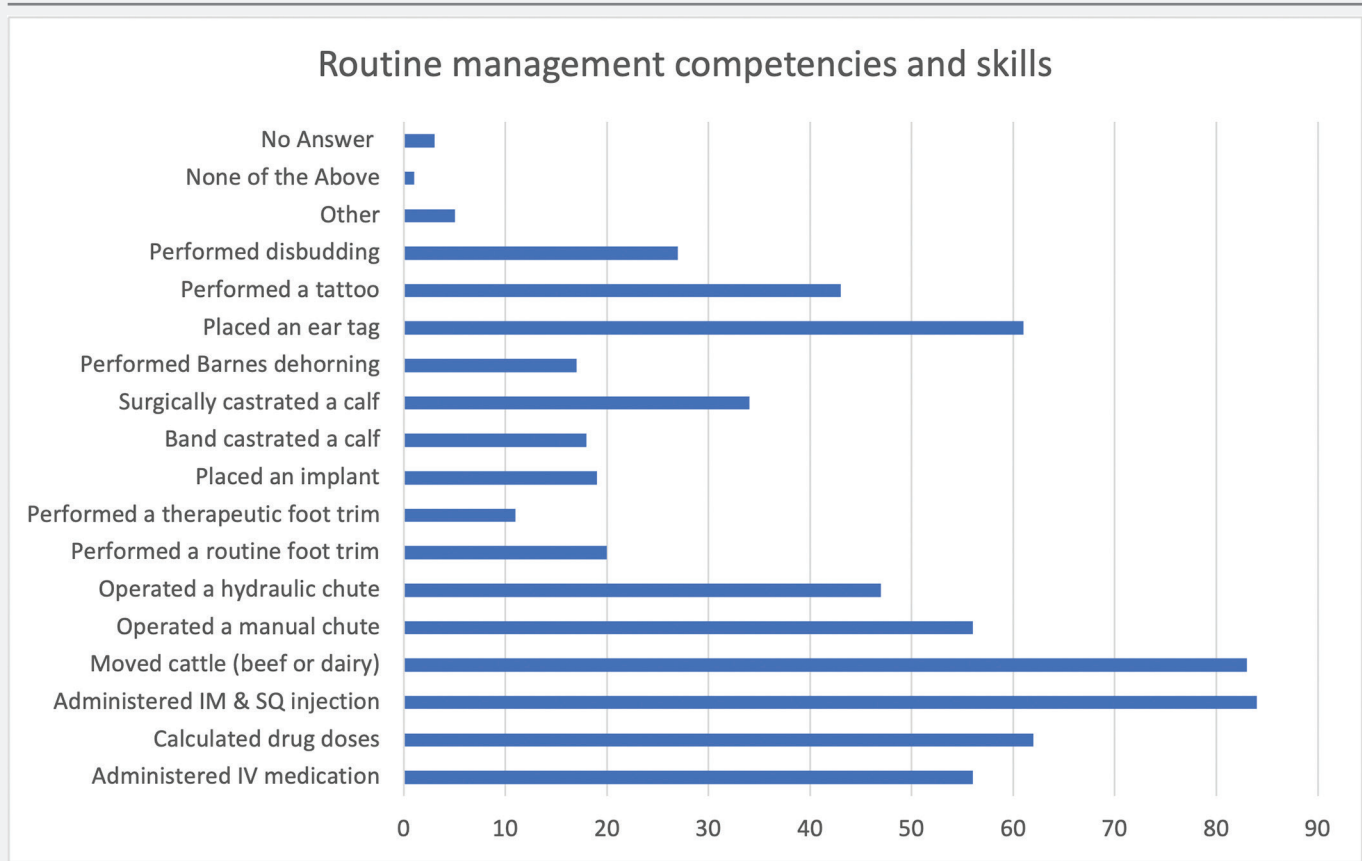


Figure 5: Number of students performing each herd investigation competency during their externships.

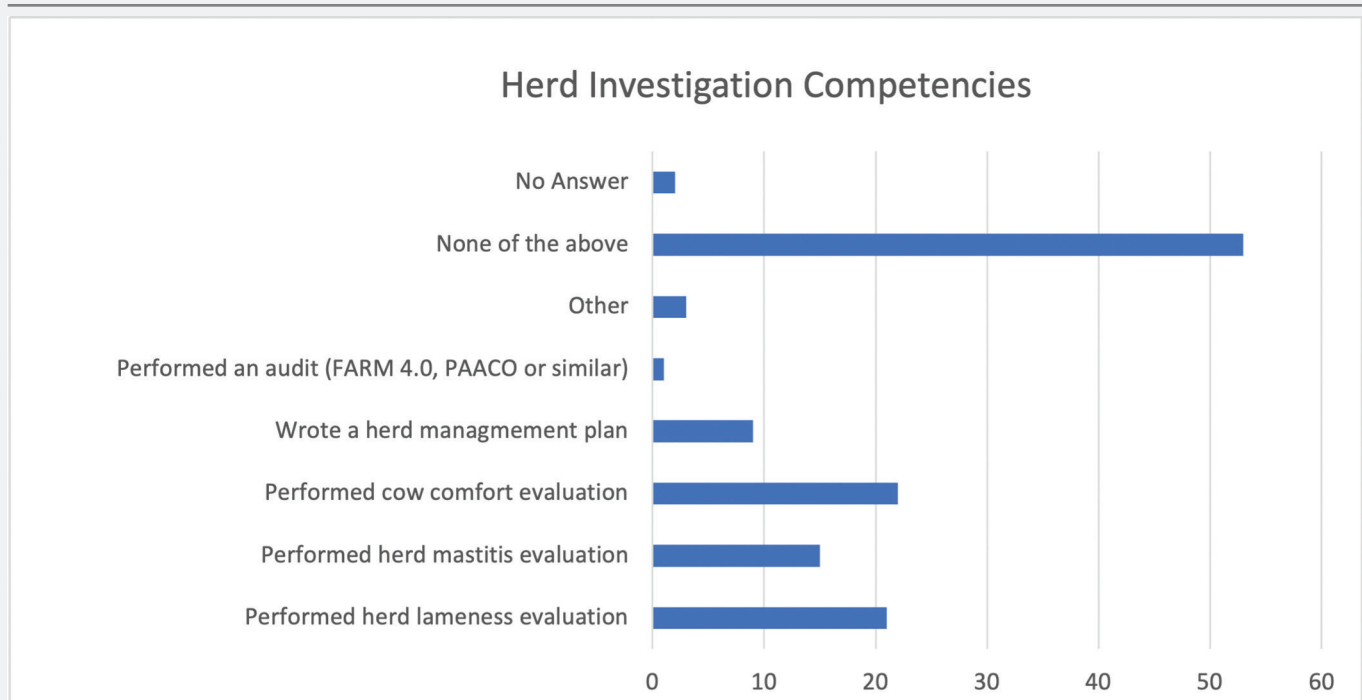


Figure 6: Number of students performing reproduction and obstetric competencies during their externships.

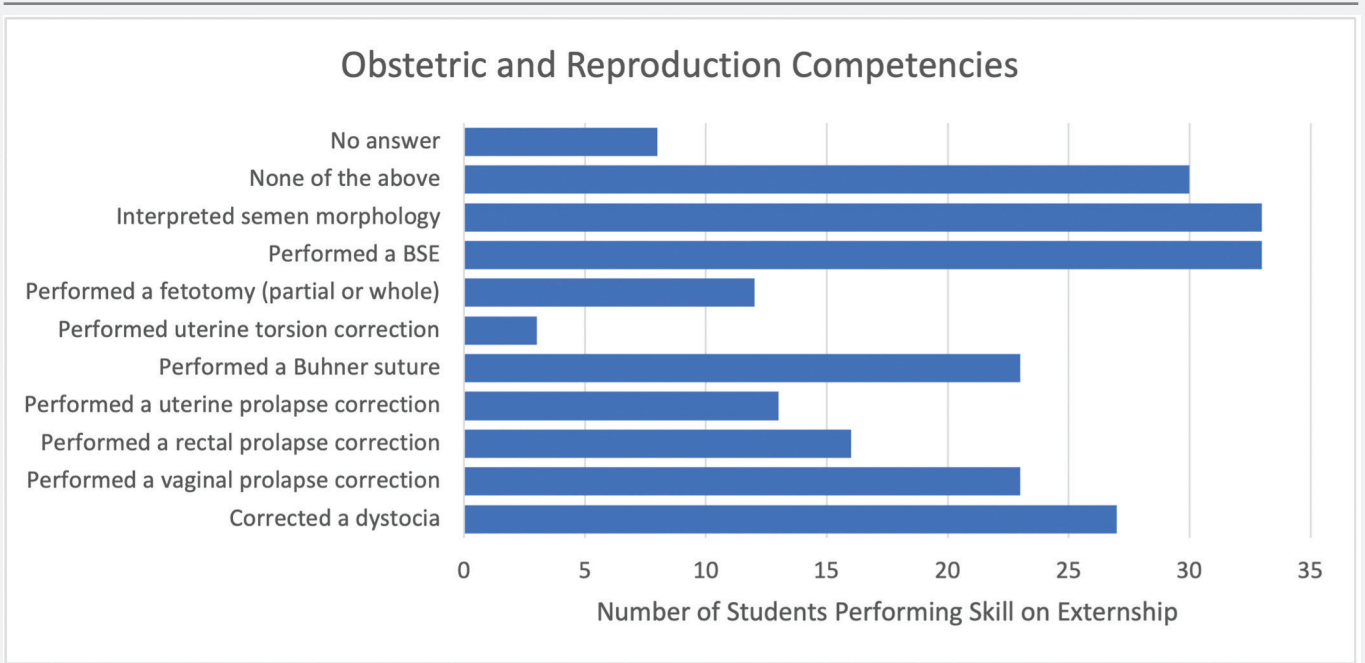


Figure 7: Number of students performing surgery and anesthesia competencies during their externships.

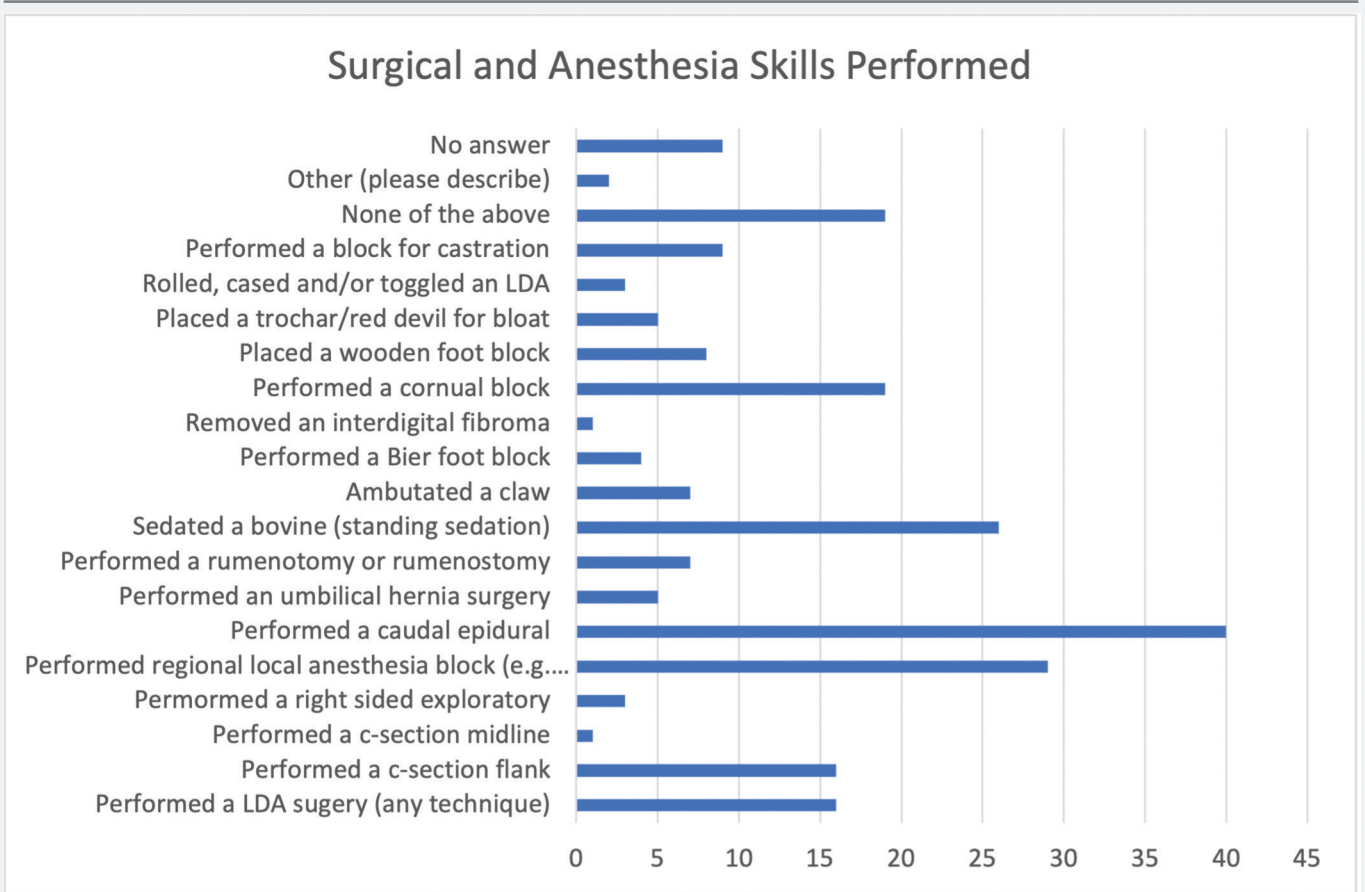
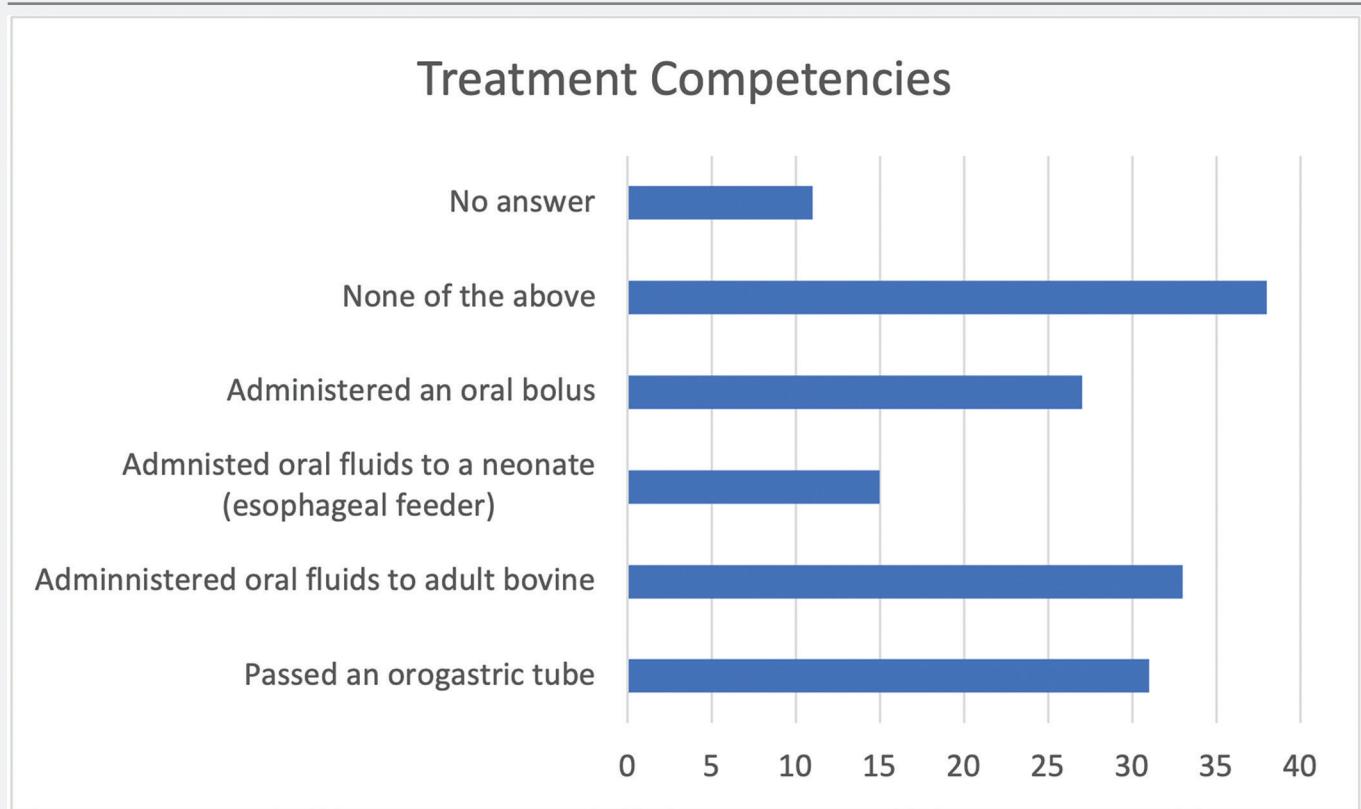


Figure 8: Number of students performing treatment competencies during their externships.



Negative experiences on externships

Students were asked if they witnessed any negative interactions during their externships. Thirteen students responded, with animal welfare issues being the most common, followed by unsafe working conditions, unprofessionalism on the part of the veterinarian, and inappropriate handling of animals. One student reported witnessing animal abuse. In all cases, except where the veterinarian was deemed unprofessional, the veterinarian discussed the situation with the student. Only 2 students reported having a negative experience: one reported racism by a client, and the other reported that the veterinarians ignored them for the majority of the externship.

Discussion

The survey results described the reasons students undertake bovine externships and their experiences. Externships are just one type of real-world experience and workplace learning that students may encounter during their careers. Limited data are available on externship outcomes for veterinary students. Respondents in our study also included students from distributive model schools, where an externship may be very similar to a traditional teaching hospital rotation.

Students reported that the top 3 reasons for performing an externship were to increase technical skills and/or knowledge or because the externship provider was a potential future employer. While extramural studies (EMS) are a requirement for students in Ireland, a study investigating learning during EMS found that future employment, experiencing a different discipline, and affordability all factored into the choice of placement.⁷ Graduating day-one competent veterinarians is important for both academic institutions and the veterinary

industry. Therefore, at a time when the attrition of food animal veterinarians is concerning for the industry, providing effective externship experiences is essential.

Positively, most students undertaking externships had hands-on experiences. This may be a result of surveying clinical year students, the type of practice, or the population of students responding to the survey only reporting largely positive experiences. Compared to the survey of students in the U.K., relatively few (only 1 in our study) reported discrimination.¹⁵ A significant difference between the externship-type experience in the U.S. and the extramural study experience in the U.K. is that large animal EMS is a requirement for all U.K. veterinary students, whereas in this study, we only surveyed student members of the AABP, indicating that these students were already interested in bovine medicine. However, discrimination could still occur in students interested in bovine practice, so the absence in this study shines a positive light on the industry.

From the data, it was apparent that students in private practices as part of a distributive model had more structured externships, including orientation, learning contracts, and feedback with more students from distributive model schools reporting the above mentioned structure compared to students from traditional models. It is a Council of Education (COE) requirement for distributive model programs to provide training and structure to externship providers in regard to orientation guidelines.¹⁷ A formal orientation and discussion of a learning contract as part of the externship can prevent mismatched expectations. In our study, only 7 students reported mismatched expectations, all of which were regarding observation versus hands-on experiences, with 1 student also reporting low caseload as a mismatched expectation. A learning contract

is typically where the students list their desired learning outcomes for the externship, and the practice confirms that those are skills the students will be able to achieve to meet both the students' and the practice's expectations. This should ideally be performed before the start of the experience so that the experience can be adjusted to meet both parties' expectations and prevent disgruntlement on both sides.

Feedback comes in many forms, including ad hoc/on-the-fly and formal feedback in an office at preset times. There is limited information on the effect of feedback in veterinary clinical education; however, recommendations for feedback in the medical education sphere have been published.¹⁸ Burgess et al. reported that feedback is essential to promote learning by informing students of their progress and areas for improvement and creating motivation. A lack of feedback can have a negative effect on learning.¹⁸ Recommendations for feedback include it being planned, explicit, descriptive, focused on behavior not personality, specific, concise, verified and honest.¹⁸ Leung et al. emphasizes that goal setting (equivalent to learning outcomes) is key for students to progress and is part of the feedback process.¹⁹ In our study, 83.7% of students received some kind of feedback. In the survey, students were asked whether they received positive feedback, negative feedback or both. A frequently recommended style of delivering feedback is the "what went well, even better yet" framework.²⁰ Our intent was that "what went well" can be interpreted as positive, and "even better yet" as negative, but due to differences in students' familiarity with different terminology, only positive and negative wording was used.

In a study investigating feedback given to dental students by clinical teachers, only 6 of 223 respondents did not give feedback. Overall, the majority of teachers in that study delivered constructive criticism, with only 21 giving negative criticism. The study also highlighted that people who interact with students in multiple roles give feedback, including administrative staff, fellow students, tutors, and examiners, with some personnel playing multiple roles.¹⁹ We did not ask our respondents who delivered the feedback, which is a limitation in comparing the two studies. While there are likely differences in responses when surveying students versus educators, there are similarities in the responses.

Students reported working 10-80 hours per week, while only 6 had required on-call duties. The wide variability likely reflects numerous aspects of practice variability, including season and type of practice. The Student American Veterinary Medical Association (SAVMA) recommends in its duty hours guidelines that students do not work more than 80 hours per week on average; however, this is not a requirement that universities or practices need to follow.²¹ Participants in our study did not report working more than 80 hours per week.

The cost for students to undertake externships ranged from \$0 to \$2,000 (mean \$324.06), although 22% received some kind of monetary assistance for the externship. Accommodation and travel were the primary sources of costs. Practices that provide accommodation may be more appealing to students to reduce student costs. However, the high end of the cost range shows that some students are willing to invest in an experience in order to expand their learning. Knowing these factors may help guide practices in what to provide students in terms of accommodation, and stipends, and organizations for a target dollar amount of scholarship funds.

The skills that students performed during externships varied across all areas of practice (communication, diagnostic, treatment, individual and herd health). The most common skills performed were history taking, transrectal palpation, transrectal ultrasound, physical examination and left displaced abomasal (LDA) surgery. Some of these skills may be challenging for students to achieve the expected competency level for graduation within the curriculum. A prime example of this is transrectal palpation and ultrasound for pregnancy diagnosis. French et al. reported that students palpated 24 cows (3 cows each week for 8 times) in a semester; however, competency was not achieved, but outcomes varied by previous experience.²² The number of palpations students need to achieve competency is therefore unknown. Due to factors including access to animals, time in the curriculum, and animal use protocol restrictions, this figure can be hard to achieve within the scheduled curriculum. Therefore, students rely heavily on real-world learning experiences like externships to improve their skills. Indeed, recent recommendations discuss the need to maximize animal welfare and decrease animal numbers.²³ Some skills may be replaced with models or cadavers; however, models cannot replicate the experience for clinical students, and there are concerns about excessive cadaver usage. Other skills, such as physical examination, are very important for new graduates. While teaching physical examination skills is possible within the confines of clinical skills labs, enabling students access to abnormal findings is challenging.

The changing caseload of production animals vs. farm animal pets in teaching hospitals also results in students needing to find experiences outside of the teaching hospital to develop key day-one skills. Communication with producers is vital to ensure compliance, biosecurity, health and welfare of the animals.^{24,25} While communication training with simulated clients is frequently part of professional skills programs, it is merely a conduit for real-life scenarios with producers. Overall, the skills that students performed match the results of multiple studies that have examined what procedures bovine veterinarians perform in general practice,⁸⁻¹¹ and other studies reporting on learning experiences in extramural studies.⁷ The development of bovine competencies to match those produced by equine and swine veterinarians is an immediate need. These competencies can be utilized by both students and practitioners hosting students on externships to develop learning contracts.

There are several limitations to this study. First, with a current clinical veterinary student population of approximately 4,500,²⁶ and a student AABP membership of 249 clinical year students (personal communication, AABP), the response rate (76/249 students) represents a small fraction of current clinical year students that likely experienced a bovine externship. Students may have only wanted to report externships that were positive, as we only asked them to describe up to 2 due to the length of the survey. We also had student respondents from distributive model schools, where the definition of externship may be different than in teaching hospital programs, particularly in terms of requirements for practices for assessment and feedback.

Conclusion

This survey provided important insights into the externship expectations of students interested in bovine practice. The survey explored the types of practices chosen by students, their reasons for engaging in an externship, the skills they gained and the structure and experience of the externship. Information from this survey suggests the importance of externship design to allow both the practice and the student to reach learning expectations. The information can be used by students to become aware of externship opportunities and by practitioners to understand the needs of students and develop effective and efficient bovine externships.

References

1. Extra-mural studies fit for the future: improving learning, flexibility and opportunity. Royal College of Veterinary Surgeons. Last modified 2024. Accessed July 2, 2024. <https://www.rcvs.org.uk/lifelong-learning/students/veterinary-students/extra-mural-studies-ems/rcvs-proposals-for-ems-policy-from-2024/>
2. Clinical Year. Texas Tech University School of Veterinary Medicine. Last modified 2024. Accessed July 2, 2024. <https://www.depts.ttu.edu/vetschool/academics/clinical-year/index.php>
3. Clinical Year. Lincoln Memorial University. Last modified 2024. Accessed July 2, 2024. <https://www.lmunet.edu/college-of-veterinary-medicine/professional-program/clinical-year/>
4. Gibbons P, Wells JK, Watson, KRL, Weale JJ, Roberson JR. A mixed method pilot study investigating challenges experienced by mixed animal veterinarians in practice and their private practice experiences prior to graduation. *Bov Pract.* 2021;56(1): 18-28
5. Gibbons P, Parkinson T. Learning in Real World Settings. In: Hodgson JL, Pelzer JM eds. *Veterinary Medical Education: A Practical Guide*. 1st ed. Wiley-Blackwell; 2024;209-224.
6. Sprecher DJ, Krehbiel J., Hauptman JG. The demographics and evaluation of externship experiences arranged by Michigan State University veterinary medicine students. *J Vet Med Ed.* 2002;29(2) 96-100.
7. Cashman D and Rackard S. Learning through extramural studies: an observational study. *Irish Vet J.* 2023;76(1) 10
8. Luby CD, McIntyre K, Jelinski MD. Skills required of dairy veterinarians in western Canada: a survey of practicing veterinarians. *Can Vet J.* 2013;54:267-270.
9. Morin DE, Constable PD, Troutt HF, Johnson AL. Surgery, anesthesia, and restraint skills expected of entry-level veterinarians in bovine practice. *J Am Vet Med Assoc.* 2002;221(7):969-974.
10. Morin DE, Constable PD, Troutt HF, Johnson AL. Individual animal medicine and animal production skills expected of entry-level veterinarians in bovine practice. *J Am Vet Med Assoc.* 2002;221(7):959-968.
11. Thomson DU, Thompson JU, Lubbers BV, Apley MD, Cull CA, Lechtenburg, KF, McCoy EJ, Schwandt EF. A survey of veterinary student exposure to and performance of clinical skills necessary for success in beef cattle veterinary practice and the relationship to the supply, demand, and value of proper training as beef cattle veterinarians. *Bov Pract.* 2017;51(2):215-228.
12. Hubbell JA., Saville WJA, Moore RM. Frequency of activities and procedures performed in private equine practice and proficiency expected of new veterinary school graduates. *J Am Vet Med Assoc.* 2008;232(1):42-46.
13. Day 1 Competencies. American Association of Swine Veterinarians. Accessed June 19, 2024. <https://umnswinenews.com/day-1-competencies-for-swine-interested-veterinary-graduates/>.
14. Wood S, Sellers E, Vallis R, Baillie S. Prioritizing practical skills for farm animal veterinary graduates using a Delphi technique. *Vet Rec.* 2023;192(8):e2643.
15. Summers OS, Medcalf R, Hubbard KA, McCarroll CS. A cross sectional study examining perceptions of discriminatory behaviors experienced and witnessed by veterinary students undertaking clinical extra-mural studies. *Front Vet Sci.* 2023;28(10):940836.
16. Gibbons P. How to get the most out of externships. In: *Proceedings of the American Association of Bovine Practitioners Annual Conference*. American Association of Bovine Practitioners. 2023;53:150-151.
17. Council on Education. American Veterinary Medical Association. Last modified 2023. Accessed June 24, 2024. <https://www.avma.org/sites/default/files/2024-01/coe-pp-December-2023.pdf>
18. Burgess A, van Diggele C, Roberts C, Mellis C. Feedback in the clinical setting. *BMC Med Ed.* 2020;20(suppl 2):460
19. Leung A, Fine P, Blizard R, Tonni I, Louca C. Teacher feedback and student learning: A quantitative study. *Eur J Dent Educ.* 2019;25:600-606.
20. Englar RE. A novel approach to simulation based education for veterinary medical communication training over eight consecutive pre-clinical quarters. *J Vet Med Ed.* 2017;44(3):502-522.
21. SAVMA Duty Hours Guidelines. Student American Veterinary Medical Association. Last modified 2024. Accessed June 19, 2024. <https://www.avma.org/sites/default/files/2020-03/2019-SAVMA-Duty-Hours-Guidelines.pdf>
22. French HM, Dascanio JJ, Gilbert GE, Robinson JQ. Bovine reproduction palpation training: does the cow make a difference? *J Vet Med Ed.* 2018;45(2):219-223.
23. *Use of Animals in Veterinary Education Handbook*. American Association of Veterinary Medical Colleges. Last modified 2023. Accessed June 19, 2023. <https://www.aavmc.org/wp-content/uploads/2024/04/AAVMC-AnimalUse-Handbook-06.pdf>
24. MacGillivray F, Bard AM, Cobb KA, et al. Communicating without words: measuring non verbal communication between veterinarians and farmers during routine herd health consultations. *J Dairy Sci.* 2023;106(8):5452-5467.
25. DeGroot A, Coe JB, Duffield R. Veterinarians' use of shared decision making during on-farm interactions with dairy and beef producers. *Vet Rec.* 2023;191(1):e2384.
26. Student American Veterinary Medical Association. Accessed on June 20, 2024. <https://www.avma.org/membership/SAVMA#:~:text=Support%20for%20you%20%E2%80%93%20from%20classroom%20to%20career&text=Currently%2C%20SAVMA%20is%20comprised%20of,over%2018%2C000%20veterinary%20student%20members>

Appendix – Externship survey

1. Please select your gender.
 - a. Female (1)
 - b. Male (2)
 - c. Other (please describe) (3)
 - d. Rather not say (4)
 2. What is your current age?
 3. Do you have children?
 - a. Yes (1)
 - b. No (2)
 4. Have you undertaken an externship in a private practice in the USA during your clinical (3rd or 4th) years of veterinary school?
 - a. Yes (1)
 - b. No (2)
 5. What veterinary school do you attend?
 6. Are you an in-state student?
 - a. Yes (1)
 - b. No (2)
 7. How many externships have you participated in in your 3rd and 4th years?
 8. How many practices did you experience during your externships?
 9. How many weeks of externships were required by your veterinary school?
- For ONE externship please answer the following questions. You will have the opportunity to answer the same questions for two externships.**
10. How long was this externship?
 11. In what state was the externship located?
 12. Which sector of the bovine industry did you experience? (check all that apply)
 - a. Dairy (1)
 - b. Cow-calf (2)
 - c. Stocker (3)
 - d. Feedlot (4)
 - e. Heifer raiser (5)
 - f. Other (please describe) (6)
 13. Which of the following best describes the percentage of species you saw during your externship?
 - a. Exclusive dairy (100%) (1)
 - b. Exclusive beef (100%) (2)
 - c. Exclusive food animal (any sector) (3)
 - d. Mixed large and small animal (4)
 - e. Mixed food animal and equine (6)
 - f. Other (7)
 14. Percentage of bovine
 - a. % Beef cattle practice : _____ (1)
 - b. % Dairy cattle practice : _____ (2)
 - c. % Other species percentages (please describe) : _____ (3)
 - d. Total : _____
 15. What type of practice did you experience?
 - a. Solo (1)
 - b. Multi doctor < 5 (2)
 - c. Multi doctor > 6. Exact number can be entered below (3)
 16. Which of the following best describes the type of practice you were in?
 - a. Independent single location (1)
 - b. Independent multi-location (2)
 - c. Independent mobile only (3)
 - d. Corporate (4)
 - e. Other (5)
 17. Did the practice employ any of the following? (check all that apply)
 - a. Interns (1)
 - b. New grads (2)
 - c. Recent grads (3)
 - d. Associate veterinarians >10 years post graduation (4)
 - e. LVT, CVT or RVT large animal technicians (bovine focused) (5)
 - f. Practice manager (6)
 - g. Practice owner (solo) (7)
 - h. Practice partner (8)
 18. With whom did you spend time with during your externship? (check all that apply)
 - a. Interns (1)
 - b. New grads (2)
 - c. Recent grads (3)
 - d. Associate veterinarians >10 years post graduation (4)
 - e. LVT, CVT or RVT large animal technicians (bovine focused) (5)
 - f. Practice manager (6)
 - g. Practice owner (solo) (7)
 - h. Practice partner (8)

19. With whom did you spend the majority of your time with during the externship? (choose one)
- Interns (1)
 - New grads (2)
 - Recent grads (3)
 - Associate veterinarians >10 years post graduation (4)
 - LVT, CVT or RVT large animal technicians (bovine focused) (5)
 - Practice manager (6)
 - Practice owner (solo) (7)
 - Practice partner (8)

20. Bovine work was primarily practiced in which of the following setting?
- In the clinic (1)
 - In the field (2)
 - Equal between clinic and field (3)

21. What percentage of time did you spend in the following settings?
- In the clinic : _____ (1)
 - In the field : _____ (2)
 - Total : _____

The following questions will ask about the type of compensation you received during your externship:

22. Did your externship provide compensation?
- Yes please describe (e.g. compensation for food, accommodations, travel, or payment) please describe (1)
 - No (2)
23. Did your externship provide housing?
- Yes (1)
 - No (2)
24. What type of housing was provided?
- AirB&B/Hotel (1)
 - Mobile home/RV provided by clinic (2)
 - Apartment in clinic (3)
 - Housing with a veterinarian/employee (4)
 - Other (please describe) (5)
25. If housing was not provided where did you stay during your externship?
- Rented AirB&B/Hotel or similar (1)
 - Lived in own RV/similar (2)
 - Lived at home (3)
 - Other (please describe) (4)
26. How did you learn about this practice for your externship? (check all that apply)
- AABP externship listings (1)
 - Veterinary school list (2)
 - Word of mouth from fellow students (3)
 - Word of mouth from faculty (4)
 - Word of mouth from other private practices or doctors you know (5)
 - Facebook or other social media group (6)
 - AABP Listserv (7)
 - Other (please describe) (8)

27. Approximately how much did the externship cost you per week (food, travel, accommodations)?

The following questions will ask about the type of financial assistance you received for your externships:

28. Did you receive any grants or funding for your externship?
- Yes (1)
 - No (2)
29. Where did you receive funding or grants from?
- Vet school (1)
 - AABP (2)
 - AVC (3)
 - SFT (4)
 - Pharmaceutical (if so which one) (5)
 - Other (please describe) (6)
30. How much funding did you receive?
31. Were you aware that opportunities existed to apply for externship funding or grants?
- Yes (1)
 - No (2)

The following questions will ask about your experiences during your externship:

32. During the externship what roles did you have? (check all that apply)
- Observation (1)
 - Supervised activity (direct supervision with veterinarian watching you) (2)
 - Supervised activity (indirect - veterinarian in the practice but not directly watching you) (3)
 - Unsupervised activity (veterinarian not directly watching nor in the practice but contactable by phone) (4)
 - Unsupervised activity (veterinarian not directly watching, not in practice and not contactable by phone) (5)
33. What was your primary role during your externship?
- Observation (1)
 - Supervised activity (of any level) (2)
 - Unsupervised activity (3)

For the following questions please choose competencies you performed during your externship (ie you actually performed not observed).

34. Communication competencies (choose all that apply)
- Collected a history (1)
 - Discussed findings from PE or diagnostic testing with client (2)
 - Discussed treatment plan with client (3)
 - Discussed costs with client (4)
 - Discussed prognosis with client (5)
 - None of the above (6)
 - Other (please describe) (7)

35. Diagnostic competencies (choose all that apply)
- Collected production records (1)
 - Analyzed production records (2)
 - Performed a physical exam (3)
 - Collected blood from the jugular vein (4)
 - Collected blood from the tail vein (5)
 - Performed a CMT (6)
 - Collected a sterile milk sample (7)
 - Performed transrectal palpation (8)
 - Performed transrectal ultrasound (9)
 - Collected urine (10)
 - Interpreted serological and molecular results for disease testing (11)
 - Interpreted CBC (12)
 - Interpreted serum chemistry (13)
 - Performed a necropsy (14)
 - Packaged samples for shipping (15)
 - Performed a percutaneous rumenocentesis (16)
 - None of the above (17)
 - Other (please describe) (18)
36. Routine management competencies (choose all that apply)
- Administered IV medication (1)
 - Calculated drug doses (2)
 - Administered IM and SQ injection (3)
 - Moved cattle (beef or dairy) (4)
 - Operated a manual chute (5)
 - Operated a hydraulic chute (6)
 - Performed a routine foot trim (7)
 - Performed a therapeutic foot trim (8)
 - Placed an implant (9)
 - Band castrated a calf (10)
 - Surgically castrated a calf (11)
 - Performed disbudding (12)
 - Performed Barnes dehorning (13)
 - Placed an ear tag (14)
 - Performed a tattoo (15)
 - None of the above (16)
 - Other (please describe) (17)
37. Herd investigation competencies (check all that apply)
- Performed herd lameness evaluation (1)
 - Performed herd mastitis evaluation (2)
 - Performed cow comfort evaluation (3)
 - Performed an audit (FARM 4.0, PAACO or similar) (4)
 - Wrote a herd management plan (5)
 - None of the above (6)
 - Other (please describe) (7)
38. Treatment competencies (choose all that apply)
- Passed an orogastric tube (1)
 - Administered oral fluids to adult bovine (2)
 - Administered oral fluids to a neonate (esophageal feeder) (3)
 - Administered an oral bolus (4)
 - None of the above (5)
 - Other (please describe) (6)
39. Obstetric and reproduction competencies (choose all that apply)
- Corrected a dystocia (1)
 - Performed a fetotomy (partial or whole) (2)
 - Performed a uterine torsion correction (3)
 - Performed a vaginal prolapse correction (4)
 - Performed a rectal prolapse correction (5)
 - Performed a uterine prolapse correction (6)
 - Performed a Buhner suture (7)
 - Performed a BSE (8)
 - Interpreted semen morphology (9)
 - None of the above (10)
 - Other (please describe) (11)
40. Surgery and anesthesia competencies. For surgical techniques please only choose those in which you were scrubbed in or had an otherwise key role not just observing. (choose all that apply)
- Performed a c-section flank (1)
 - Performed a c section midline (2)
 - Performed an LDA surgery (any technique) (3)
 - Rolled, cast and/or toggled an LDA (4)
 - Performed a right sided exploratory (5)
 - Performed an umbilical hernia surgery (6)
 - Performed a gomer bull surgery (epididymectomy, vasectomy, or side winder) (7)
 - Performed a rumenotomy or rumenostomy (8)
 - Placed a trochar / red devil for bloat (9)
 - Sedated a bovine (standing sedation) (10)
 - Performed general anesthesia or recumbent sedation of a bovine (11)
 - Amputated a claw (12)
 - Performed a cornual block (13)
 - Performed a block for castration (14)
 - Performed a Bier foot block (15)
 - Placed a wooden foot block (16)
 - Removed an interdigital fibroma (17)
 - Performed regional local anesthesia block (e.g. paravertebral) (18)
 - Performed a caudal epidural (19)
 - None of the above (20)
 - Other (please describe) (21)
41. Which of the following did you perform for the first time during your externship (i.e. not during clinical rotations in a teaching hospital or clinical skills lab)? (choose all that apply)
- Collected a history (1)
 - Discussed findings from PE or diagnostic testing with client (2)
 - Discussed treatment plan with client (3)
 - Discussed costs with client (4)
 - Discussed prognosis with client (5)
 - None of the above (6)
 - Other (please describe) (7)

42. Which of the following did you perform for the first time during your externship (i.e. not during clinical rotations in a teaching hospital or clinical skills lab)?
(choose all that apply)
- Collected production records (1)
 - Analyzed production records (2)
 - Performed a physical exam (3)
 - Collected blood from the jugular vein (4)
 - Collected blood from the tail vein (5)
 - Performed a CMT (6)
 - Collected a sterile milk sample (7)
 - Performed transrectal palpation (8)
 - Performed transrectal ultrasound (9)
 - Collected urine (10)
 - Interpreted serological and molecular results for disease testing (11)
 - Interpreted CBC (12)
 - Interpreted serum chemistry (13)
 - Performed a necropsy (14)
 - Packaged samples for shipping (15)
 - Performed a percutaneous rumenocentesis (16)
 - None of the above (17)
 - Other (please describe) (18)
43. Which of the following did you perform for the first time during your externship (i.e. not during clinical rotations in a teaching hospital or clinical skills lab)?
(choose all that apply)
- Administered IV medication (1)
 - Calculated drug doses (2)
 - Administered IM and SQ injection (3)
 - Moved cattle (beef or dairy) (4)
 - Operated a manual chute (5)
 - Operated a hydraulic chute (6)
 - Performed a routine foot trim (7)
 - Performed a therapeutic foot trim (8)
 - Placed an implant (9)
 - Band castrated a calf (10)
 - Surgically castrated a calf (11)
 - Performed disbudding (12)
 - Performed Barnes dehorning (13)
 - Placed an ear tag (14)
 - Performed a tattoo (15)
 - None of the above (16)
 - Other (please describe) (17)
44. Which of the following did you perform for the first time during your externship (i.e. not during clinical rotations in a teaching hospital or clinical skills lab)?
(choose all that apply)
- Performed herd lameness evaluation (1)
 - Performed herd mastitis evaluation (2)
 - Performed cow comfort evaluation (3)
 - Performed an audit (FARM 4.0, PAACO or similar) (4)
 - Wrote a herd management plan (5)
 - None of the above (6)
 - Other (please describe) (7)
45. Which of the following did you perform for the first time during your externship (i.e. not during clinical rotations in a teaching hospital or clinical skills lab)?
(choose all that apply)
- Passed an orogastric tube (1)
 - Administered oral fluids to adult bovine (2)
 - Administered oral fluids to a neonate (esophageal feeder) (3)
 - Administered an oral bolus (4)
 - None of the above (5)
 - Other (please describe) (6)
46. Which of the following did you perform for the first time during your externship (i.e. not during clinical rotations in a teaching hospital or clinical skills lab)?
(choose all that apply)
- Corrected a dystocia (1)
 - Performed a fetotomy (partial or whole) (2)
 - Performed a uterine torsion correction (3)
 - Performed a vaginal prolapse correction (4)
 - Performed a rectal prolapse correction (5)
 - Performed a uterine prolapse correction (6)
 - Performed a Buhner suture (7)
 - Performed a BSE (8)
 - Interpreted semen morphology (9)
 - None of the above (10)
 - Other (please describe) (11)
47. Which of the following did you perform for the first time during your externship (i.e. not during clinical rotations in a teaching hospital or clinical skills lab)?
(choose all that apply)
- Performed a c-section flank (1)
 - Performed a c section midline (2)
 - Performed an LDA surgery (any technique) (3)
 - Rolled, cast and/or toggled an LDA (4)
 - Performed a right sided exploratory (5)
 - Performed an umbilical hernia surgery (6)
 - Performed a gomer bull surgery (epididymectomy, vasectomy, or side winder) (7)
 - Performed a rumenotomy or rumenostomy (8)
 - Placed a trochar / red devil for bloat (9)
 - Sedated a bovine (standing sedation) (10)
 - Performed general anesthesia or recumbent sedation of a bovine (11)
 - Amputated a claw (12)
 - Performed a cornual block (13)
 - Performed a block for castration (14)
 - Performed a Bier foot block (15)
 - Placed a wooden foot block (16)
 - Removed an interdigital fibroma (17)
 - Performed regional local anesthesia block (e.g. paravertebral) (18)
 - Performed a caudal epidural (19)
 - None of the above (20)
 - Other (please describe) (21)

48. Which of the following did you observe (ie not participate in but just watch)? (choose all that apply)
- Collected a history (1)
 - Discussed findings from PE or diagnostic testing with client (2)
 - Discussed treatment plan with client (3)
 - Discussed costs with client (4)
 - Discussed prognosis with client (5)
 - None of the above (6)
 - Other (please describe) (7)
49. Which of the following did you observe (ie not participate in but just watch)? (choose all that apply)
- Collected production records (1)
 - Analyzed production records (2)
 - Performed a physical exam (3)
 - Collected blood from the jugular vein (4)
 - Collected blood from the tail vein (5)
 - Performed a CMT (6)
 - Collected a sterile milk sample (7)
 - Performed transrectal palpation (8)
 - Performed transrectal ultrasound (9)
 - Collected urine (10)
 - Interpreted serological and molecular results for disease testing (11)
 - Interpreted CBC (12)
 - Interpreted serum chemistry (13)
 - Performed a necropsy (14)
 - Packaged samples for shipping (15)
 - Performed a percutaneous rumenocentesis (16)
 - None of the above (17)
 - Other (please describe) (18)
50. Which of the following did you observe (ie not participate in but just watch)? (choose all that apply)
- Administered IV medication (1)
 - Calculated drug doses (2)
 - Administered IM and SQ injection (3)
 - Moved cattle (beef or dairy) (4)
 - Operated a manual chute (5)
 - Operated a hydraulic chute (6)
 - Performed a routine foot trim (7)
 - Performed a therapeutic foot trim (8)
 - Placed an implant (9)
 - Band castrated a calf (10)
 - Surgically castrated a calf (11)
 - Performed disbudding (12)
 - Performed Barnes dehorning (13)
 - Placed an ear tag (14)
 - Performed a tattoo (15)
 - None of the above (16)
 - Other (please describe) (17)
51. Which of the following did you observe (ie not participate in but just watch)? (choose all that apply)
- Performed herd lameness evaluation (1)
 - Performed herd mastitis evaluation (2)
 - Performed cow comfort evaluation (3)
 - Performed an audit (FARM 4.0, PAACO or similar) (4)
 - Wrote a herd management plan (5)
 - None of the above (6)
 - Other (please describe) (7)
52. Which of the following did you observe (ie not participate in but just watch)? (choose all that apply)
- Passed an orogastric tube (1)
 - Administered oral fluids to adult bovine (2)
 - Administered oral fluids to a neonate (esophageal feeder) (3)
 - Administered an oral bolus (4)
 - None of the above (5)
 - Other (please describe) (6)
53. Which of the following did you observe (ie not participate in but just watch)? (choose all that apply)
- Corrected a dystocia (1)
 - Performed a fetotomy (partial or whole) (2)
 - Performed a uterine torsion correction (3)
 - Performed a vaginal prolapse correction (4)
 - Performed a rectal prolapse correction (5)
 - Performed a uterine prolapse correction (6)
 - Performed a Buhner suture (7)
 - Performed a BSE (8)
 - Interpreted semen morphology (9)
 - None of the above (10)
 - Other (please describe) (11)
54. Which of the following did you observe (ie not participate in but just watch)? (choose all that apply)
- Performed a c-section flank (1)
 - Performed a c section midline (2)
 - Performed an LDA surgery (any technique) (3)
 - Rolled, cast and/or toggled an LDA (4)
 - Performed a right sided exploratory (5)
 - Performed an umbilical hernia surgery (6)
 - Performed a gomer bull surgery (epididymectomy, vasectomy, or side winder) (7)
 - Performed a rumenotomy or rumenostomy (8)
 - Placed a trochar / red devil for bloat (9)
 - Sedated a bovine (standing sedation) (10)
 - Performed general anesthesia or recumbent sedation of a bovine (11)
 - Amputated a claw (12)
 - Performed a cornual block (13)
 - Performed a block for castration (14)
 - Performed a Bier foot block (15)
 - Placed a wooden foot block (16)
 - Removed an interdigital fibroma (17)
 - Performed regional local anesthesia block (e.g. paravertebral) (18)
 - Performed a caudal epidural (19)
 - None of the above (20)
 - Other (please describe) (21)

The following questions will center around why you chose your externships and the process of setting up your externship:

55. Who did you communicate with to set up the externship?
- Senior DVM/owner/partner (1)
 - Other DVM in practice (2)
 - Technician (3)
 - Office manager (4)
 - Other (please state) (5)
56. What was your primary reason for completing the externship?
- Required by veterinary school (1)
 - To gain further technical skills (2)
 - To gain further knowledge (3)
 - To gain practice management skills (4)
 - To experience particular area of bovine practice (5)
 - Future employment opportunities (6)
 - Other (please describe) (7)
57. What factors influenced which practice you chose? (choose all that apply)
- Location (1)
 - Species ratio (e.g. percentage bovine) (2)
 - Employment opportunities (3)
 - Housing provided (4)
 - Stipend provided (5)
 - Transport provided (6)
 - Type of practice eg. Dairy, stocker, feedlot, cow calf (7)
 - Positive feedback from other students (8)
 - Recommended by a DVM or faculty member (9)
58. Prior to the externship did the practice have you complete documentation on your goals for the practice?
- Yes (1)
 - No (2)
59. Did the practice provide you with expectations or other requirements for the externship?
- Yes (1)
 - No (2)
60. Prior to starting the externship did the practice have you complete legal/liability paperwork?
- Yes (1)
 - No (2)
61. Did the practice have a formal orientation on the first day?
- Yes (1)
 - No (2)
62. Please describe the formal orientation you received.
63. Did the practice require you to have student PLIT?
- Yes (1)
 - No (2)
64. Do you have student PLIT?
- Yes (1)
 - No (2)
65. During your externship did you experience any of the following? (choose all that apply)
- Verbal abuse (1)
 - Sexual harassment (2)
 - Mismatched expectations (3)
 - Other (please describe) (4)
66. Mismatched expectations included: (choose all that apply)
- Caseload overall (1)
 - Bovine caseload (2)
 - Hours worked (3)
 - Observation vs participation (4)
 - Other (please describe) (5)
67. Did you participate in on call/emergency?
- Yes (1)
 - No (2)
68. Was participation in on call/emergency work mandatory?
- Yes (1)
 - No (2)
69. On average how many hours did you work a week?
70. When on farm calls did you witness any of the following?
- Welfare issues of the animals (1)
 - Inappropriate animal handling (2)
 - Unsafe working facilities (3)
 - Animal abuse (4)
 - Unethical decision making (5)
 - Unprofessionalism on the part of the veterinarian (6)
 - Illegal drug use (e.g. utilizing prohibited drugs in an animal, or not following extra label drug laws) (7)
71. Did the supervising veterinarian discuss the observed situation with you afterwards?
- Yes (1)
 - No (2)
72. If you experienced quiet times during your externship what did you do? (choose all that apply)
- Self directed study (1)
 - Other species work (2)
 - Study directed by veterinarian (3)
 - Technical work (4)
 - Left the practice/personal time (5)
 - Evidence based medicine (e.g. performed literature review to increase knowledge of a particular case) (6)
 - Read veterinary or industry related magazines/ website (7)
 - Other (please describe) (8)
73. Did the practice require you to drive to calls with the veterinarian in the truck?
- Yes (1)
 - No (2)
74. During your externship did you receive feedback?
- Yes (1)
 - No (2)

-
75. When did feedback occur?
- Ad hoc (1)
 - At end of each week (2)
 - Halfway through (3)
 - At end (4)
76. How was it delivered?
- Formal in person (1)
 - Written (2)
 - Ad hoc (3)
77. What type of feedback did you receive?
- Positive only (1)
 - Positive and negative (2)
 - Negative only (3)
 - Other (please describe) (4)
78. Were you asked if you wanted to receive feedback before they delivered it?
- Yes (1)
 - No (2)
79. Did you receive a grade for this rotation?
- Yes (1)
 - No (2)
80. Did you have any contact with your veterinary school during your externship?
- Yes (1)
 - No (2)
81. If the case of a negative experience during an externship do you know who to contact at your home institution to gain guidance and feedback regarding the situation?
- Yes (1)
 - No (2)

