

# Food Supply Veterinary Medicine

The Food Supply Veterinary Medicine Coalition (FSVMC) was formed in 2004 with a mission to assure the public that food continues to be abundant, safe, and wholesome by ensuring that veterinarians are appropriately involved throughout the food supply system. The premise of the FSVMC is that safety and wholesomeness of food are enhanced when veterinarians are included in all steps of production and processing.

Studies were commissioned by the FSVMC in May 2004 to implement a far-reaching research program to examine the demand and supply patterns for food animal veterinarians and the issues that affect and shape those patterns. The FSVMC provided support and guidance during development of the research program.

Members of the FSVMC include the Academy of Veterinary Consultants, American Association of Avian Pathologists, American Association of Bovine Practitioners, American Association of Food Hygiene Veterinarians, American Association of Small Ruminant Practitioners, American Association of Swine Veterinarians, American Veterinary Medical Association, Association of American Veterinary Medical Colleges, and the USDA–Food Safety and Inspection Service.

In addition, the Canadian Veterinary Medical Association was extremely supportive of this research program and instrumental in promoting data collection in Canada. Bayer Animal Health provided substantial financial support and participated in discussions regarding conduct of the studies.

“Attracting students into careers in food supply veterinary medicine” represents the first in a series of 3 articles that will provide results and analysis of the information gathered during the research program. The other 2 articles in the series (one will evaluate effects of changing careers within veterinary medicine, job retention, job satisfaction, and career commitment on the demand for and availability of veterinarians for careers in food supply veterinary medicine, and the other will examine the future demand, likely shortages, and strategies for creating a better future for veterinarians in food supply veterinary medicine) will be published in subsequent issues of the *JAVMA*. These 3 articles constitute the Executive Summary for the research program.

It is hoped that this series of articles generates meaningful discussions and yields creative and appropriate solutions for this important aspect of the veterinary profession.

## Attracting students into careers in food supply veterinary medicine

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**T**he future for food supply veterinary medicine (FSVM) professionals is at an uncertain juncture. Many experts from academia, industry, and government have concluded that the North American veterinary profession is facing a shortage of food animal veterinarians in the public, private, industrial, and academic sectors.<sup>1,2</sup> Various societal trends and economic events have led to growing concerns about these issues.<sup>3,4</sup> Driving forces affecting the supply of and demand for FSVM professionals range from concerns about food safety, public health, and animal welfare to negative consequences of changing dietary habits to industrial consolidation in agribusiness and the threat of bioterrorism-agroterrorism. These changes and threats have the potential to alter the structure of labor

markets and the future demand for FSVM professionals. In addition, the threat of zoonotic diseases, public anxiety about biodiversity, and the impact of large and highly concentrated food production systems on the environment are expected to influence the supply and demand for food supply veterinarians.<sup>5-8</sup>

Failure to systematically study in a scientific-based manner this changing mix of threats and opportunities will leave FSVM professionals uninformed and unable to prepare for a reality that will be nothing like the world of James Herriott. Responses to the challenges that endanger the health of the veterinary profession must be guided by sound theory and good data. Herd or flock populations with disease are not cured when the veterinary medical knowledge base is ignored and systematic data are not gathered and evaluated. Similarly, constituents interested in working to counter threats and realize opportunities in the FSVM area cannot rely on only anecdotal evidence. To create meaningful strategies aimed at increasing student and practitioner interest and commitment in this area, a

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thorough understanding of external forces influencing recruitment of veterinary students, student career choice and job selection, and career retention in the field of FSVM is needed.

In the study reported here, we examined issues surrounding the supply of food animal veterinarians. Specifically, we focused on a series of surveys that examined factors influencing veterinary students to select various career paths and evaluated the effectiveness of potential strategies for increasing the number of students who will consider a career in FSVM. A pervasive theme throughout this study was a strong focus on understanding the phenomenon from the perspective of the so-called “customer.” As such, we sought to gain insight into issues that influenced the career selection of students by directly asking the opinions of students and faculty. The latter group has unique insight into student motivations because of their exposure to a broad cross section of students and their ability to observe the students over time.

In general, veterinary professional and educational literatures have not focused on the motivation for veterinary students to select a particular career focus area. Although extremely little has been written with regard to what attracts students to select a particular career focus in veterinary medicine, several articles have offered strategies on how to encourage more students to select a career in FSVM. The troubling aspect is that accurate information of the motivations driving the career selection of veterinary students is needed to provide confidence that the strategies proposed are appealing to the targeted group. Articles published on this topic tend to be based on personal observation and anecdotal evidence rather than empirical study, and they lack a voice-of-the-customer approach that provides relevant parties with a say in the factors that are important to them in these matters. There is no substitute for obtaining information directly from contemporary and future veterinarians who are actually making decisions regarding their career area and job selection.

In recent years, a number of conferences and symposia have been held that focus on issues related to FSVM, public health, and biosecurity. A repeated topic of discussion at these meetings is the need to attract larger numbers of motivated and qualified food animal veterinarians into these professional areas. As a result, a number of strategies have been generated to encourage more students to select FSVM-related careers. Some of the more popular methods that have been proposed include the following:

- Mentoring and veterinarian role models.<sup>9-12</sup>
- Greater amounts of course work providing experience in FSVM.<sup>10,11,13-17</sup>
- Greater awareness of career opportunities in FSVM.<sup>5,9,11,12,15,17</sup>
- Exposure to careers in FSVM in high school.<sup>1,11,15-17</sup>
- Creation of veterinary centers of excellence and curricular programs.<sup>1,9,10,13,18</sup>
- Reduced debt load through scholarships and loan-forgiveness programs.<sup>10,12,15,17</sup>
- Moving from a focus on teaching specific skills to managing information.<sup>14</sup>

- Increased salaries for FSVM veterinarians and better skills in business management.<sup>15</sup>
- Better ties among veterinary schools, industry, and government.<sup>17</sup>
- Modifications to admissions criteria or admissions procedures.<sup>1,10,15,16,19</sup>
- Adoption of an engineering or tracking model in veterinary curriculums.<sup>1,14,15,20,21</sup>
- Intensive experiences in FSVM for veterinary students.<sup>18,22-25</sup>
- Emphasis on promoting FSVM among college undergraduates.<sup>26</sup>
- Limited licensure.<sup>1,15,21,27</sup>

Within the aforementioned categories for general strategies, several specific tactics have been proposed. For example, in a report<sup>17</sup> on a 2002 symposium dealing with population health education, the 66 participants at the symposium identified several potential actions related to building awareness of veterinary careers in population health and recruiting veterinary students into this career field. Their recommendations included establishment of a liaison at each veterinary college, who would be responsible for maintaining relationships with public and corporate partners in public health and ensuring broader exposure of students to careers in population health through the use of outside speakers in courses, career days, a series of speakers on population health, and industry tours. Specific recommendations included the creation of an “Animal Planet”-styled television program targeting young people, with the focus on population health issues, thereby continuing exposure of preveterinary and current veterinary students to career opportunities in population health. In addition, partnerships would be developed with governmental agencies (such as the CDC or FDA) to provide sponsored learning and training opportunities in population health. In terms of expanding the pool of potential recruits who might select a career in population health, symposium participants suggested greater promotion of recruitment efforts for population health, rapid admission to veterinary school for a small number of extra students at several veterinary medical colleges or schools that would focus on this area, offers of tuition reimbursement, additional summer classes on population health, international experiences in exchange for a service commitment after graduation, and better promotion of the critical role of veterinarians in dealing with bioterrorism, agroterrorism, and biosecurity.

Another meeting that yielded specific tactics for the general categories is the Skills, Knowledge, Aptitude, and Attitude Colloquium in 2003.<sup>9</sup> Suggestions in the area of recruiting provided by participants at that meeting include the development of an attractive message to provide potential applicants with a realistic job profile, development of age-appropriate materials aimed at students in K-12, incorporation of FSVM material in career promotional information, broad recruiting to increase the diversity of the applicant pool, educating current veterinary medical faculty members regarding opportunities for graduate veterinarians in emerging career areas, providing high school

guidance counselors with up-to-date and accurate materials on veterinary careers as well as the inclusion of practicing veterinarians in the process, organizing speakers to share messages about the wide range of career options available in veterinary medicine, development of links to other programs within a university, and more effective use of Internet resources.

Clearly, many people have been interested in and concerned about the issue of inadequate numbers of food animal veterinarians for some time. It is also apparent that there are many opinions regarding the best course of action that the profession could take to increase the number of graduate veterinarians who enter careers in FSVM.

An obvious issue for interested stakeholders is to determine which of the many proposed strategies will be most effective. The study reported here addresses the broad issues and factors that impact a veterinary student's selection of a career path in FSVM and strategies that will be most effective for attracting students to careers in FSVM. Both issues were addressed from the perspective of the students who will make these decisions.

## Materials and Methods

Three surveys and interviews with 4 focus groups were conducted in the study. Results reported here represent findings for the information obtained.

**Focus groups**—The purpose of the interviews with the 4 focus groups was to provide initial insights into existing and emerging societal and economic factors that affect the applicant pool of students attracted to FSVM. Specifically, we sought to better understand the factors that influence a veterinary student's career path (ie, a career in FSVM vs a career in other options, such as companion animal medicine [which was considered to be the same as small animal medicine and comprised canine, feline, avian nonpoultry, and exotic species] or equine medicine). The primary objective of the focus group data was to provide information that would help us create survey items used in the quantitative analysis. However, some details of the focus group data were reported because we believed it could assist readers in more fully interpreting the quantitative findings.

Focus groups were conducted at 2 colleges of veterinary medicine. The College of Veterinary Medicine at Kansas State University and at the University of California–Davis were selected because each had major food animal programs in beef and dairy cattle and was located in states with a strong agricultural industry with a tradition in the beef and dairy cattle sectors.

Two focus groups (the first comprising 12 students in the first month of their veterinary medical education and the second comprising 11 veterinary medical school faculty representing a number of disciplines) were conducted at each institution. Students and faculty were recruited with the assistance of the veterinary school administrators at each institution. The focus groups were conducted at Kansas State University and the University of California–Davis in August and October 2004, respectively.

Each focus group session began with a moderator introducing the researchers, topics to be discussed, and discussion guidelines. This was followed by a short self-introduction of each participant. Participants then engaged in a short written exercise designed to focus their thinking on the topics to be covered during the session. After completing this activity, the main discussion commenced, which typically covered 5 to 7 topic areas. At the end of each focus group, a summary of the session was offered by the researchers and the participants were debriefed on the purpose of the study.

Each focus group session lasted between 60 and 85 minutes. Audiotapes and videotapes were made of each session; these tapes were subsequently used to create a transcript of each session. Results for focus groups were developed on the basis of an interpretation of notes made during the focus group sessions, a review of the audiotape and videotape recordings, and content analysis of the transcripts.

**Surveys**—Survey items were developed on the basis of insights gained from an extensive review of the literatures on careers in veterinary medicine, general human resources and career selection, and job commitment and from numerous discussions with practicing veterinarians, officers of veterinary medical associations, Deans of veterinary medical schools, veterinary students, and food animal faculty in the United States and Canada. Data from focus groups were particularly useful in creation of items on career decisions. Items were also gleaned from existing scales that have been validated and assessed for reliability.

Three surveys<sup>a</sup> were conducted to obtain data. Information was obtained by use of a survey of first-year veterinary students, a survey of third- and fourth-year veterinary students, and a survey of Deans and faculty members at veterinary medical schools. Each survey was an Internet-based survey because of the ease of administration, convenience for respondents, and high rate of Internet use among the target population. Each survey was tested prior to administration, and all surveys were approved by the Food Supply Veterinary Medicine Coalition and Association of American Veterinary Medical Colleges.

The e-mail addresses for faculty and students were secured from all 32 Colleges (or Schools) of Veterinary Medicine in the United States and Canada. In most cases, the Dean's office at each institution sent an initial e-mail to potential participants that informed subjects of the impending survey and encouraged participation. The research team then sent an e-mail to each potential participant that explained the purpose of the research project, identified the sponsoring groups, and invited participation in the survey. That message also included a Web URL that linked directly to the online survey. The research team sent 2 additional e-mails at weekly intervals to encourage participation in an attempt to increase response rates.

**Data analysis**—Data for each survey were imported into a statistical program.<sup>b</sup> Survey response rates were strong and allowed us to conclude with a high degree of confidence that the results obtained for the

sample populations were consistent with results for the larger populations they represented.

The survey of first-year veterinary students was sent to 1,183 valid e-mail addresses; 718 first-year veterinary students responded, which represented a response rate of 60.7%. The survey of third- and fourth-year veterinary students was sent to 1,657 valid e-mail addresses; 713 third- and fourth-year students responded (270 of whom indicated a food animal focus), which represented a response rate of 43.0%. Findings reported here for the survey of third- and fourth-year veterinary students were focused on data received from the 270 respondents who indicated a food animal focus. Finally, the survey of Deans and faculty at veterinary medical schools was sent to 439 valid e-mail addresses; 214 Deans and faculty members responded, which represented a response rate of 48.7%.

Results were reported in 2 major sections. The first section represented results associated with factors that influenced a student's decision regarding a career area within veterinary medicine. The second section represented results associated with students' and faculty members' evaluation of the effectiveness of various potential strategies that could be used to encourage greater interest in FSVM among students.

## Results

### Faculty and Veterinary Student Focus Groups

**Sample population**—Participants in focus groups identified 9 factors as primary issues influencing the initial career focus of students as they entered veterinary school. These 9 factors were life experiences, educational debt and salary, important and interesting work, family considerations, job availability, physical demands of the job, lifestyle issues, animal care mentality, and experiences in veterinary medical school.

**Life experiences**—Experiences gained in high school and even earlier were mentioned by students as having a profound influence on the type of career they envisioned for themselves. Experiences with food animal veterinarians, growing up on a farm, and raising animals all contributed to their current preferred career focus. One student stated, "I'm interested in equine and large and food animal. The basis of this is a lot from my history. Again, 4-H and FFA being a big influence in my life. I did grow up on about an acre of land and was able to have a lot of animals in my presence, so that was the initial start to it."

Faculty members echoed the notion of early experiences shaping student interest. They also added that 4-H programs, television shows (such as "Animal Planet"), and a student's family veterinarian all served as early influences that helped to point students toward a particular career focus.

**Educational debt and salary**—Members of student focus groups were aware that a substantial student debt load would need to be serviced after graduation. Furthermore, students reported that they were generally aware that they needed a high-paying career to pay off the debt in a reasonable amount of time, although they were not in agreement as to the salary they had to earn.

One student said, "I think I'll graduate with roughly \$150,000 in loans. This is undergraduate plus graduate and it's stifling to the point that I feel like I absolutely need to get into something that pays well." In general, there was a perception that a career as a companion animal practitioner or a board-certified veterinary specialist (eg, veterinary ophthalmologist) would pay more than would a career as a large animal practitioner.

In contrast, participants of the faculty focus groups did not generally perceive money as an extremely important factor influencing student career choice at this early stage in their veterinary education. However, some faculty did suggest that financial concerns become a larger factor as students approached graduation: "We start talking to them about [debt load] in the first year of the veterinary curriculum, we even talk about budgets, and it just is a glazed look. The panic doesn't happen until about a third or halfway through their senior year, and all of the sudden they realize what they are going to have to live on and what they are going to have to use to service their debt, and it scares them."

**Important and interesting work**—Some members of student focus groups expressed the idea that the potential to do work that is personally meaningful is a factor motivating them to pursue a particular career focus. Similarly, a few students indicated that their interest in a particular career was a larger driving force than their interest in making money. Another concept was the notion that specializing in a particular niche may allow a veterinarian to make a name for himself or herself and achieve recognition from peers. The ability to use interesting technologic equipment was also cited as a factor influencing career choice.

**Family considerations**—Members of student focus groups indicated that family issues would likely influence their career choice at some point in the future (many did not have a spouse or children at this point). Women in the group expressed concerns that the additional time needed in school to seek training to become a board-certified veterinary specialist would take away from time needed to raise a family. Other concerns under this area included a desire to limit the amount of family relocation and the need for a spouse to find a job. One female student replied, "...we have to be near a decent-sized airport for him [her future spouse] to have a decent job. And, if I were in large animal, I think that that would be too limiting."

Participants in faculty focus groups also reported that student concerns over the availability of adequate work for their spouse influenced a student's career decision. One faculty member responded, "I would say that large animal practice in general has not adapted to the feminization of the profession and doesn't accommodate the family lifestyles...both folks in the relationship working." However, many faculty members believed that this did not influence a student's career selection until late in veterinary school when they started looking for a job.

**Job availability**—Members of student focus groups reported that their perception of the number of

available jobs in a particular career area had influenced their career choice. Some mentioned becoming a board-certified veterinary specialist as a way to succeed because of fewer competitors. Others mentioned that opportunities for practice in rural areas are plentiful and available for those interested in them.

Large corporate farms were mentioned as an opportunity for more jobs for food animal veterinarians. However, participants in both the student and faculty focus groups raised concerns that tasks traditionally done by food animal veterinarians are being performed less expensively by nonveterinarians because of the profit orientation of food animal producers. One student commented, “[An animal science] graduate is going to be doing most of the things that we’re taught graduating here...your cesarean section, all your animal health care, stuff like that. On the ranch, you can’t afford to outsource that to a veterinarian and pay those kinds of costs.”

**Physical demands of the job**—A few students expressed concerns over the perceived physical demands of a career as a food animal veterinarian. The discussions revealed that this was a larger issue as one grows older. One student expressed the concern, “With large animals, it depends so much on strength, and after getting out of school and everything, how many good years do I have left before [I can’t work with large animals anymore]?”

Participants in faculty focus groups also identified the physical demands of the job as a factor that influences veterinary students to choose a career in companion animal practice over a career in food animal practice. Faculty members suggested that students’ concerns about injury were more of an issue than students’ concerns about their ability to physically manage large animals. One faculty member responded, “I hear students concerned about the amount of time that they could be in large animal medicine, even though they really like handling the large animals. I think they worry because they’ve seen people who have gotten hurt or think that they would not be able to maintain it over time.”

Similar to comments expressed by the veterinary students, faculty members suggested that students often consider the physical nature of the job as a long-term, ongoing concern. Thus, the concern remains about whether the veterinary students would be able to perform the required tasks of the job when they are older.

**Lifestyle issues**—Another factor influencing the initial career choice of students entering veterinary school could be termed lifestyle issues. Two elements of this surfaced: geographic preferences and hours spent on the job. Geographic preference led some students toward careers in food animal medicine (ie, some were interested in living in a rural community), whereas it discouraged others from a career working with food animals (ie, desire to live in a large urban center). However, there was not a strong consensus on the strength of this factor because many members of the student focus groups indicated that they would go to whatever geographic location was necessary to have the type of career they selected.

Input of faculty members concerning the lifestyle factors was more focused on perceptions of students’ preferences for work lifestyles. Specifically, faculty members suggested that concerns over the amount of time spent at work and the time of day that work was performed influenced a veterinary student’s career focus. One faculty member stated, “When students are telling me about their new jobs, they’ll say, ‘It’s 3 days a week, 10 hours a day, and I don’t have to do emergency every other weekend.’ They don’t say, ‘It’s a 4-person practice; that they have this kind of equipment.’ The first thing they tell me is, ‘I’m working 4 days a week and every other Saturday.’”

Companion animal practices were mentioned as a way for students to have a more constant and controllable work lifestyle in terms of the number of hours worked and the time of day (or night) those hours are worked. Some faculty members discussed this as a generational issue, with the availability of more free time being a much more critical factor for the current generation graduating from veterinary schools than it was for past generations of graduates.

**Animal care mentality**—A small group of student participants mentioned that animal welfare influenced their career choice. These students expressed a strong interest in repairing “broken” animals, which they believed was at odds with the bottom-line, production orientation that is necessary for food animal veterinarians. One student declared, “That’s completely why I couldn’t do [large animal medicine]. Hands down. Because you have 2,000 head of cattle and 1 doesn’t matter, but it matters to me.”

Faculty members also suggested that students often enter veterinary school with either an individual patient or a herd production mentality that influences their decisions with regard to career focus. As expressed by 1 faculty member, “Another decision factor is whether or not you’re of the mindset that you want to treat an individual patient or a population. People that like the details and the intricacies of treating an individual patient will go more into small [companion] animals, and if you’re more of the mindset of treating the population as a whole, then you will go into that kind of medicine. I think that plays a very important part of the [career selection] decision.”

**Experiences in veterinary medical school**—Students in the focus groups had not yet experienced veterinary medical school and thus were unable to comment extensively on its influence on career choices. However, experiences in veterinary medical school were mentioned prominently by faculty members as a motivation for entering a particular career focus. Although this motivation is not as applicable to the influences of career choice on new veterinary students, it is worth mentioning that participants in the faculty member focus groups indicated that veterinary students’ final in-school experiences often led them to consider careers in companion animal medicine because of the exposure to enthusiastic clinical teaching faculty and residents in veterinary medical teaching hospitals. One faculty member stated, “I think that the clinical teaching faculty have a fantastic influence on

our students. They are with them sometimes 14 to 16 hours at a stretch. In the ICU, there is a problem-solving activity that takes place, and that has a greater weight on the final career decision because it is the last hoorah.”

**Conclusions for results of focus groups**—In addition to their value in framing the career-selection decision faced by first-year veterinary students, the aforementioned 9 factors were used in the creation of the survey items. Analysis of the focus group data revealed that veterinary students entering the curriculum have little knowledge of the career opportunities available for food animal veterinarians. The knowledge that they do have tends to be anecdotal or, in some cases, based on their own personal observations while growing up in a rural environment. However, this knowledge and the image of food animal veterinarians are largely focused on rural practitioners. Few have insight into other career opportunities in FSVM. The image of rural veterinarian practitioners is mixed, with many veterinary students holding negative perceptions of this type of career.

#### Survey of First-year Veterinary Students

**Survey population**—In terms of childhood experiences, respondents for the first-year veterinary students primarily grew up in suburban areas and large communities, but a sizable proportion (88/718 [12.3%]) were from ranches and farms. Analysis revealed that 30 of the 104 (28.8%) first-year students who planned to spend between one third and two thirds of their time working with food animals grew up on a farm or ranch and that 31 of the 74 (41.9%) students planning to spend two thirds or more of their time working with food animals grew up on a farm or ranch. Thus, first-year students most interested in working with food animals were typically raised in a rural environment.

To expand on this, 49 of the 74 (66.2%) first-year veterinary students who planned to spend two thirds or more of their time working with food animals grew up in a community with a population < 10,000, whereas 65 of the 104 (62.5%) students who planned to spend one third to two thirds of their time working with food animals grew up in a community with a population < 10,000. Comparably, only 69 of the 355 (19.4%) students who did not plan to work with food animals grew up in a community with a population < 10,000, whereas 214 (60.3%) of these nonfood animal students grew up in a suburb of a large city or a community with a population > 50,000 (56 [15.8%] grew up in a city with a population > 500,000). Thus, we detected a common pattern of a rural background among veterinary students who were most interested in careers in FSVM.

In addition, veterinary students who planned to enter careers in food animal medicine were more likely than other students to have worked for a food animal veterinarian prior to veterinary school, been actively involved with food animals in 4-H in their youth, and had a good role model in food animal production when growing up. Consistent with results for

the focus groups, we determined that responding first-year veterinary students as a group had limited knowledge of careers in FSVM. In the survey, 435 of the 718 (60.6%) first-year student respondents disagreed with the statement, “I have a great deal of knowledge about veterinary career opportunities in the food animal industry.”

**Factors affecting selection of a career area**—Guided largely by data obtained from the focus groups, we asked first-year veterinary students to evaluate 43 questions that examined influences that may impact a student's selection of a career area. Data were analyzed by use of a multivariate ANOVA with a between-groups design. This analysis revealed a significant ( $P < 0.001$ ) multivariate effect for planned occupational area (Pillai trace, 0.946;  $F$  statistic, 6.28; and 129  $df$ ). Post hoc follow-up tests (Tukey multiple comparison tests) were then used to identify the groups that differed significantly and specific dependent variables for which they differed. Results for the analysis were summarized (Table 1).

Several observations can be made from analysis of the data. In terms of factors affecting decisions for a career area, students who planned to embark on a career working with food animals, compared with students who planned nonfood animal careers, believed that a career in food animal medicine would be intellectually challenging and allow them to fully use their veterinary medical knowledge. Food animal students were desirous of a rural lifestyle and believed that rural areas offer sufficient recreational and cultural opportunities. Compared with students interested in other types of careers, students seeking careers in FSVM reported less concern about the physical aspects of the job and were less concerned about growing older and still being able to physically work with large animals.

First-year veterinary students interested in food animal medicine typically also had more of a production mindset. This was determined on the basis that the human-animal bond apparently did not drive their interest in veterinary medicine, they were less apt to believe that food animal medicine is too focused on profits, and they were less inclined to believe that all sick animals should be treated no matter what the cost. However, first-year veterinary students who planned to seek a career in FSVM were more likely to believe that working with food animals can result in a stable career, and they were typically more interested in caring for herds and flocks and having a career that aids in protecting the nation's food supply, compared with responses for first-year veterinary students who were interested in pursuing nonfood animal career paths.

Compared with students pursuing careers in companion animal medicine, food animal students were less concerned about working lifestyle. They were less concerned about on-call hours, working nights or weekends, controlling the number of hours they work, and receiving frequent vacation time.

**Principal components analysis and regression analysis**—Principal components analysis is commonly used as a method of data reduction to identify representative factors from a larger set of variables. The goal

Table 1—Mean scores\* for perceptions of factors that influenced the planned career decision of first-year veterinary students, on the basis of planned occupational area.

Item	Food animal	Mixed animal	Companion animal	Equine
A career in food animal medicine is as intellectually challenging as companion animal medicine.	6.59 <sup>a</sup>	5.97 <sup>b</sup>	5.26 <sup>c,d</sup>	5.42 <sup>b,d</sup>
It is vital to me that my veterinary job be personally meaningful.	6.52	6.66	6.70	6.68
I want to practice the type of veterinary medicine that would let me live a rural lifestyle.	6.47 <sup>a</sup>	5.39 <sup>b</sup>	3.38 <sup>c</sup>	5.02 <sup>b</sup>
The thought of caring for herds or flocks of food animals is very appealing to me.	6.28 <sup>a</sup>	4.97 <sup>b</sup>	2.84 <sup>c</sup>	4.14 <sup>d</sup>
Food animal veterinary medicine would allow me to fully utilize my medical knowledge.	6.27 <sup>a</sup>	5.37 <sup>b</sup>	4.47 <sup>c,d</sup>	4.98 <sup>b,d</sup>
I value a strong mentorship-training program in my first veterinary job.	6.15 <sup>a</sup>	6.44 <sup>a,b</sup>	6.50 <sup>b</sup>	6.42 <sup>a,b</sup>
I believe that livestock producers value the services of food animal veterinarians.	6.01 <sup>a</sup>	5.43 <sup>b</sup>	4.87 <sup>c,d</sup>	5.22 <sup>b,d</sup>
I desire a job that allows me to help protect the nation's food supply.	5.81 <sup>a</sup>	4.55 <sup>b</sup>	2.86 <sup>c</sup>	3.78 <sup>d</sup>
Food animal veterinary medicine offers a good stable career.	5.68 <sup>a</sup>	5.00 <sup>b</sup>	4.76 <sup>b</sup>	4.74 <sup>b</sup>
I require an occupational area in veterinary medicine that allows me time to raise a family.	5.65	5.48	5.35	4.90
I want to use my veterinary career to be a community leader.	5.59	5.55	5.44	5.34
I feel very secure about the future demand for my chosen occupational area in veterinary medicine.	5.59 <sup>a</sup>	5.15 <sup>b</sup>	5.87 <sup>a</sup>	5.70 <sup>a</sup>
I think that I will receive a good annual salary from my occupational area in veterinary medicine.	5.55 <sup>a</sup>	5.09 <sup>b</sup>	5.33 <sup>a,b</sup>	5.46 <sup>a,b</sup>
I put much less emphasis on material things than most people I know.	5.21 <sup>a</sup>	4.94 <sup>a,b</sup>	4.49 <sup>b</sup>	4.42 <sup>b,c</sup>
Some of my veterinary medicine classes have made me realize the type of veterinary work I want to avoid.	5.20 <sup>a,b</sup>	5.09 <sup>a</sup>	5.48 <sup>b</sup>	5.44 <sup>a,b</sup>
My experiences while in veterinary medical school have positively influenced the type of work I want to do in my career.	5.07 <sup>a</sup>	5.47 <sup>a,b</sup>	5.59 <sup>b</sup>	5.44 <sup>a,b</sup>
I can think of a faculty member in the veterinary college that has positively shaped my career focus.	4.87	5.13	5.03	5.30
I worry that long hours doing veterinary work will interfere with my family life.	4.84	5.11	5.01	4.86
The major satisfactions in my life will come from my veterinary job.	4.81	5.04	5.06	5.16
I want recognition from my colleagues for contributions to my occupational area in veterinary medicine.	4.75	4.71	4.83	4.80
I want a veterinary career where I can control the number of hours I work and when I work them.	4.72 <sup>a</sup>	4.92 <sup>a,b</sup>	5.39 <sup>c</sup>	5.38 <sup>b,c</sup>
Having abundant free time to pursue my hobbies is important to me in selecting an occupational area in veterinary medicine.	4.53 <sup>a,b</sup>	4.26 <sup>a</sup>	4.71 <sup>b</sup>	4.70 <sup>a,b</sup>
It is very important to me to work in a veterinary medical group practice.	4.49 <sup>a,b</sup>	4.53 <sup>a</sup>	4.96 <sup>b</sup>	4.66 <sup>a,b</sup>
I am willing to miss important family activities to do emergency work at my veterinary job.	4.36	4.05	3.99	4.30
I am concerned about the ability of my significant other to find a job close to where I work.	4.21	4.00	3.67	3.72
The bond between humans and their pets is a big part of my interest in veterinary medicine.	4.15 <sup>a</sup>	5.66 <sup>b</sup>	6.34 <sup>c</sup>	5.24 <sup>b</sup>
Frequent vacation time from my veterinary job is very important to me.	4.05 <sup>a</sup>	4.16 <sup>a</sup>	4.74 <sup>b</sup>	4.40 <sup>a,b</sup>
I worry a lot that there are few good jobs in food animal veterinary medicine.	3.75 <sup>a</sup>	3.56 <sup>a</sup>	2.87 <sup>b</sup>	3.56 <sup>a</sup>
I do not want to be on call very often in my occupational area in veterinary medicine.	3.72 <sup>a</sup>	3.93 <sup>a</sup>	4.85 <sup>b</sup>	3.78 <sup>a</sup>
I would be upset if I had to regularly work nights or weekends in my veterinary career.	3.59 <sup>a</sup>	3.89 <sup>a</sup>	4.49 <sup>b</sup>	3.92 <sup>a,b</sup>
I am seriously considering a career in food animal medicine because of information I learned in veterinary school.	3.52 <sup>a</sup>	3.81 <sup>a</sup>	2.17 <sup>b</sup>	2.60 <sup>b</sup>
The lifestyle I want to lead requires that I make much more than the average veterinarian.	3.44 <sup>a,b</sup>	3.38 <sup>a</sup>	3.80 <sup>b</sup>	3.96 <sup>a,b</sup>
My selection of an occupational area in veterinary medicine will be heavily influenced by my significant other's job.	3.39	3.57	3.29	3.40
I am concerned that I will have to travel too much with my veterinary work.	3.16 <sup>a</sup>	3.09 <sup>a</sup>	2.59 <sup>b</sup>	3.12 <sup>a</sup>
I worry that I might be injured if I work with food animals.	2.95 <sup>a</sup>	3.61 <sup>b</sup>	4.05 <sup>c</sup>	2.88 <sup>a,b</sup>
I worry that I will be physically unable to deal with large food animals when I am older.	2.85 <sup>a</sup>	3.64 <sup>b</sup>	4.02 <sup>b</sup>	3.74 <sup>b</sup>
I believe we should treat all sick animals no matter what the cost.	2.72 <sup>a</sup>	3.32 <sup>b</sup>	3.85 <sup>c</sup>	3.70 <sup>b,c</sup>
Veterinarians who have a lot of money are happier than veterinarians who have only a little money.	2.49 <sup>a,b</sup>	2.45 <sup>a</sup>	2.70 <sup>a,b</sup>	3.08 <sup>b</sup>
I selected an occupational area in veterinary medicine because it allows me to pay off my veterinary school debt faster.	2.43	2.69	2.90	2.34
Food animal veterinary medicine is too concerned with making profit.	2.33 <sup>a</sup>	3.01 <sup>b</sup>	3.95 <sup>c</sup>	3.52 <sup>b,c</sup>
I am intimidated by the size of many food animals.	1.53 <sup>a</sup>	2.27 <sup>b</sup>	3.38 <sup>c</sup>	1.66 <sup>a,b,c</sup>
Rural areas do not have enough recreational or cultural amenities to satisfy me.	1.48 <sup>a</sup>	2.27 <sup>b</sup>	4.03 <sup>c</sup>	2.84 <sup>b</sup>
I dislike the amount of physical work required of food animal veterinarians.	1.40 <sup>a</sup>	2.17 <sup>b</sup>	3.32 <sup>c</sup>	2.22 <sup>b</sup>

\*Values represent mean scores for each item determined for responses on a 7-point scale (1, strongly disagree; 2, disagree; 3, somewhat disagree; 4, neutral; 5, somewhat agree; 6, agree; and 7, strongly agree).  
<sup>a-d</sup>Within a row, means with different superscript letters differ significantly ( $P < 0.05$ ).

is to reduce the larger set of variables into a more parsimonious set that retains the nature and character of the original variables. In the study reported here, we applied the principal components analysis to 43 items examining influences on first-year veterinary students' selection of a career area. The technique allowed us to identify variables that were strongly correlated and group them accordingly.

We examined items that the principal components

analysis identified as belonging to the same factor for common substantive meaning among the items. For example, the first 5 items all dealt with time away from work (eg, vacation, not on call, or abundant free time); thus, this factor was termed free time. To simplify the analysis and interpretation, we used scores that represented each factor in subsequent regression analyses, rather than scores for each of the 43 separate items.

Results from the principal components analysis

Table 2—Principal components analysis of items affecting career decisions of veterinary medical students.

Factor	Scale item	Factor loading
Free time (variance accounted for, 13.66%; Eigenvalue, 3.01; scale mean value, 4.52; and Cronbach $\alpha$ value, 0.803*)	Frequent vacation time from my veterinary job is very important to me.	0.777
	I want a veterinary career where I can control the number of hours I work and when I work them.	0.761
	Having abundant free time to pursue my hobbies is important to me in selecting an occupational area in veterinary medicine.	0.731
	I do not want to be on call very often in my occupational area in veterinary medicine.	0.690
	I would be upset if I had to regularly work nights or weekends in my veterinary career.	0.660
Physical requirements (variance accounted for, 12.42%; Eigenvalue, 2.73; scale mean value, 3.20; and Cronbach $\alpha$ value, 0.830)	I worry that I might be injured if I work with food animals.	0.859
	I worry that I will be physically unable to deal with large food animals when I am older.	0.858
	I dislike the amount of physical work required of food animal veterinarians.	0.719
	I am intimidated by the size of many food animals.	0.711
Family concerns (variance accounted for, 10.14%; Eigenvalue, 2.23; scale mean value, 4.11; and Cronbach $\alpha$ value, 0.715)	I am concerned about the ability of my significant other to find a job close to where I work.	0.753
	My selection of an occupational area in veterinary medicine will be heavily influenced by my significant other's job.	0.684
	I am concerned that I will have to travel too much with my veterinary work.	0.654
	I worry that long hours doing veterinary work will interfere with my family life.	0.616
	I require an occupational area in veterinary medicine that allows me time to raise a family.	0.529
Meaningful career (variance accounted for, 8.56%; Eigenvalue, 1.88; scale mean value, 5.50; and Cronbach $\alpha$ value, 0.619)	I want recognition from my colleagues for contributions to my occupational area in veterinary medicine.	0.728
	The major satisfactions in my life will come from my veterinary job.	0.713
	I want to use my veterinary career to be a community leader.	0.646
	It is vital to me that my veterinary job be personally meaningful.	0.544
Use of veterinary medical knowledge (variance accounted for, 8.45%; Eigenvalue, 1.86; scale mean value, 5.32; and Cronbach $\alpha$ value, 0.822)	A career in food animal medicine is as intellectually challenging as companion animal medicine.	0.824
	Food animal veterinary medicine would allow me to fully utilize my medical knowledge.	0.758
Rural lifestyle (variance accounted for, 8.63%; Eigenvalue, 1.90; scale mean value, 4.78; and Cronbach $\alpha$ value, 0.879)	I want to practice the type of veterinary medicine that would let me live a rural lifestyle.	0.863
	Rural areas have enough recreational or cultural amenities to satisfy me.	0.822

\*The Cronbach  $\alpha$  value is a measure of reliability that ranges from 0 to 1, with a value of 0.600 deemed the lower limit of acceptability.

were compiled (Table 2). Analysis indicated 6 multiple-item factors that illustrated adequate factor structure (eg, high values for factor loadings and minimal values for cross-loadings), acceptable Cronbach  $\alpha$  values, and logical substantive meaning among items. High values for factor loadings indicated that items within a factor were strongly related.

The 6 factors were subsequently used in 2 separate regression analyses to predict student selection of a

career area. In addition to the 6 factors, several single items for demographic and decision factors were included as independent variables in the model (Appendix).

Two related dependent variables were used in separate regression equations. In the first regression model, the dependent variable used was the percentage of time veterinary students planned to spend working with food animals after graduation. In the second

regression analysis, a binary dependent variable was created on the basis of the respondents' planned occupational areas. Responses for this binary dependent variable were coded as 0 for students who planned to have nonfood animal careers (ie, companion animal predominant, companion animal exclusive, or equine practice) and 1 for students who planned to have a career in FSVM (ie, food animal exclusive, food animal predominant, or mixed animal practice; federal government; or state or local government). Respondents who indicated a planned occupation in university, uniformed service, industry, and not-for-profit sectors were not included in this logistic regression because we were unable to determine from the survey question whether the focus in those areas would be food animal or nonfood animal. Linear regression was used in the analysis of the percentage-of-time dependent variable, and logistic regression was used for analyzing the binary variable on planned occupational area.

All variables were entered by use of a stepwise estimation approach into the respective regression equation. Linear multiple regression analysis that used the percentage-of-time dependent variable resulted in 8 predictors with significant beta weights that explained 49.5% of the variance in the dependent variable. Five predictors, which explained 50.9% of the variance, were significant in the logistic regression analysis that used the binary dependent variable. Only significant predictors were reported for the regression models.

Results for the 2 regression analyses indicated that those veterinary students who planned to work with food animals after graduation had higher amounts of experience with food animals prior to entering veterinary school, had a desire to live in smaller communities, perceived that they would be able to fully use their veterinary medical knowledge in food animal medicine, believed that companion animal medicine was not a prestigious career, had a production animal orientation, typically had a significant other, were uncertain about the future of food animal medicine, were not concerned about the physical requirements of working with food animals, and typically were male (Tables 3 and 4).

#### Attracting Veterinary Students to FSVM Careers

**Attraction strategies**—On the basis of information gleaned from focus groups, surveys, interviews with faculty members, and a review of the literature on careers in veterinary medicine, we developed a list of 16 strategies that could be used to encourage more stu-

dents to consider careers in FSVM. We evaluated the efficacy of these strategies from a number of perspectives, including first-year veterinary students, third- and fourth-year veterinary students, and veterinary medical school Deans and faculty. The 3 groups rated each of the 16 strategies as to their effectiveness at encouraging more veterinary students to consider careers in FSVM. Ratings of the 3 groups of respondents were summarized (Table 5).

We also examined the strategy rankings provided by first-year veterinary students on the basis of the students' selections of career choice. No differences were found between those who planned a career working with food animals and those who planned to enter other areas of veterinary medicine. Specifically, the top 10 strategies listed by first-year veterinary students were the same for those who planned to enter a career in FSVM and those who were entering a nonfood animal career (although the ranking within the top 10 varied slightly).

The top-rated strategies revolved around financial considerations and increased exposure to food animal medicine (Table 5). For example, the strategies of paying off student loans, financial assistance in purchasing equipment, assistance in setting up a practice, and providing student scholarships all involved financial components. Top-rated strategies for increased exposure included offering summer internships, mentoring and shadowing programs with food animal veterinarians, mentoring programs with food animal faculty, programs that would enable students to work with food animals during their first semester in veterinary med-

Table 3—Results of linear regression analysis predicting the percentage of time veterinary students indicated they planned to spend working with food animals after graduation.

Predictors	Beta	t value	P value
Past food animal experience	0.359	9.705	< 0.001
Desired community size	-0.199	-5.673	< 0.001
Gender	-0.145	-4.873	< 0.001
Knowledge utilization perceptions	0.164	5.256	< 0.001
Prestige of companion animal careers	-0.128	-4.386	< 0.001
Companion animal orientation	-0.081	-2.714	0.007
Significant other	0.078	2.714	0.007
Job availability perceptions	-0.075	-2.579	0.010

The dependent variable for the model was the percentage of time a veterinary student indicated that they planned to spend working with food animals after graduation.

Values for the model were as follows:  $R^2$ , 0.495; adjusted  $R^2$ , 0.488;  $F$  statistic, 76.845; and  $P < 0.001$ .

Table 4—Results of logistic regression analysis predicting career area of veterinary students.

Predictors	Beta	SE	Wald	P value
Desire to live a rural lifestyle	0.295	0.039	57.48	< 0.001
Concern about physical demands of job	-0.049	0.020	5.69	0.017
Experience with food animals	0.072	0.014	28.25	< 0.001
Companion animal orientation	-0.179	0.070	6.46	0.011
Concern about hours worked	-0.463	0.094	24.23	< 0.001

The binary dependent variable was the respondent's planned occupational area (ie, food animal career or nonfood animal career).

Values for the model were as follows: correct classification rate, 80.1%;  $\chi^2$ , 280.5; 5  $df$ ; and  $P < 0.001$ .

Table 5—Mean scores\* for 3 groups surveyed to determine the effectiveness of potential strategies for use in attracting veterinary students to a career in FSVM.

Strategy	First-year students	Third- and fourth-year students	Deans and faculty members
Pay off all student loans in exchange for working in a food animal veterinary medicine field for 3 years.†	6.1	5.4	5.8
Offer paid 8-week summer externships in food animal medicine.	5.9	4.1	5.7
Financial assistance in purchasing equipment to begin a food animal practice.	5.6	5.4	4.5
Establishment of mentoring-shadowing program that matches high school students with food animal veterinarians.	5.6	5.2	5.6
Provide job placement services for food animal careers.	5.5	5.7	4.9
Assigning students interested in a food animal career to a faculty mentor.	5.5	5.3	5.6
Assistance in setting up a food animal practice.	5.4	6.3	4.8
Providing substantial scholarships to those interested in food animal veterinary medicine.	5.2	4.3	5.6
A first-semester program in veterinary medical school that lets students study and treat food animals.	5.2	5.1	5.2
Orientation session prior to the start of first-year classes that highlights career options in various veterinary medicine fields.†	5.0	4.4	4.9
Produce a television show to compete with "Emergency Vets" called "Farm Vets."	4.9	4.9	4.8
Provide high school and undergraduate college students written information about different food animal careers.	4.8	5.5	4.8
Reserve class slots for academically qualified applicants who express a commitment to food animal veterinary medicine.	4.3	4.6	5.1
Making students select a curriculum track that provides detailed knowledge in particular areas of emphasis.†	4.3	5.5	4.6
Create a compact disc that features the life and career of food animal veterinarians.	4.2	4.9	4.5
Early admission decisions targeted toward academically qualified applicants who express a commitment to food animal veterinary medicine.	4.1	4.5	4.8

\*Values represent mean scores for each item determined for responses on a 7-point scale (1, very ineffective; 2, ineffective; 3, somewhat ineffective; 4, neutral; 5, somewhat effective; 6, effective; and 7, very effective). †Slight differences in wording existed between the questions provided to the deans and faculty members and the questions provided to the veterinary students.

Table 6—Results of content analysis of open-ended responses of first-year veterinary student perceptions of the benefits of a career in FSVM.

FSVM career benefits	Theme description	Percentage of responses
Rural lifestyle	Benefits related to living in a rural community, working outside, and the ability to travel.	29
Public health or public safety	Benefits related to contributing to the safety of the nation's food supply, assisting with public health, and helping food producers succeed.	15
Variety or interesting tasks	Benefits related to the ability to engage in a large variety of interesting tasks and challenging work.	14
Work with good people	Benefits related to the pleasure of working with nice, interesting people in the course of performing one's job.	12
Flexible hours (autonomy)	Benefits related to the chance to be one's own boss, an autonomous work environment, and flexibility in work hours.	8
Good income	Benefits related to earning a decent living and the opportunity for reducing one's student loans.	6
Personally satisfying	Benefits related to a sense that the job holds a great deal of enjoyment and personal satisfaction.	5
Stable career or job opportunities	Benefits related to high demand for services, few food animal veterinarians, stable demand for services, and the opportunity to transition into different types of careers.	5
Low stress (slower pace)	Benefits related to a lack of stressful situations; understanding, nonemotional clients; and a slower pace of work.	4
Building a community	Benefits related to respect from others, being considered a community leader, and having the opportunity to help improve the community.	2

ical school, and providing orientation sessions that would highlight diverse career options.

To identify career benefits that can be promoted to potential applicants, all first-year veterinary students were asked to list the major benefits of being a food animal veterinarian. A total of 931 benefits were subjected to content analysis to detect common themes. The content analysis involved one of the investigators

reading all open-ended responses and generating an initial list of benefit categories. The responses were then read by the same investigator again and assigned to a specific benefit category. Categories with a small number of responses were combined into 1 category defined as "other." A second investigator then read the assigned benefits to evaluate the appropriateness of the classification. Disagreements between the 2 investiga-

tors were resolved through discussion. Ten themes emerged from the data, with the top 5 themes accounting for 78% of the responses (Table 6).

## Discussion

The objective of the study reported here was to examine factors that influenced veterinary students to select various career paths and evaluate the effectiveness of potential strategies for increasing the number of students willing to consider a career in FSVM. As such, we reported on the perceptions of veterinary students and faculty members to gain insight into the reasons that students select or avoid particular career paths, how best to reach current and potential veterinary students with information on careers in FSVM, and the types of other incentives that would be most effective in encouraging more veterinary students to consider a career in FSVM.

The presumption we operated under was that there would be a sufficient number of FSVM positions with adequate salary or income-generating potential. It would be a disservice to veterinary students to graduate more veterinarians with training for a career in FSVM without having adequate employment opportunities. We believe there will be growth in many FSVM career sectors, including private practice, government, industry, and academia.<sup>10,27</sup> However, in some sectors (eg, private practice in underserved rural areas), restructuring may be needed for profitable opportunities to be available.

Because these recommendations were based on the perceptions and ratings of current veterinary students and faculty members, they represent their views of the current and future employment environment and should be interpreted as such. It is possible that dramatic changes in the veterinary profession will attract groups of students to FSVM who hold other perspectives than the ones surveyed in this study. For example, FSVM careers may require major increases in the amount of data management and analysis work that is performed and a reduction in the amount of time spent in direct care of food animals. This may be attractive to a new segment of students who have perceptions that differ from those of current veterinary students in terms of the factors influencing their career selection.

On the basis of the aforementioned data analysis, we provide several recommendations that we believe could increase the supply of veterinary students interested in pursuing a career in FSVM. Those recommendations are as follows:

- Veterinary students should receive greater exposure to the benefits of careers in FSVM. This exposure should include paid summer externship opportunities, increased numbers of food animal faculty, working with food animals during the first semester of veterinary medical school, increased numbers of courses on food animals, orientation sessions focused on careers in FSVM, and further study into creating regional centers of excellence.
- Professional veterinary associations, firms in industry, and government agencies should increase the number

and dollar amounts of scholarship funds reserved for veterinary students pursuing a career in FSVM.

- Veterinary students who concentrate on food animal medicine should participate in a paid summer externship in private practice, industry, or the government sector.
- Information that accurately reflects the varied career duties of veterinarians involved in FSVM should be developed and disseminated in an effort to promote the idea that FSVM careers will allow veterinarians to fully use their veterinary medical knowledge.
- Students in preveterinary programs and veterinary students during the initial years of veterinary medical school should be educated on issues related to the proper handling of large animals to overcome concerns about the physical aspects of a career in FSVM.
- Professional veterinary associations should provide seminars, tutorials, and other forms of advice and assistance to help new graduate veterinarians establish food animal practices.
- Veterinarians who specialize in food animal medicine should receive financial assistance in the form of student loan debt relief for each year that they work in this occupational field in an underserved area as well as low-interest loans or grants to cover the costs of start-up equipment.
- Colleges or schools of veterinary medicine should target students from rural areas that have had a substantial amount of experience with food production.
- Veterinary students interested in food animal medicine should receive assistance with career selection through assigned, enthusiastic faculty role models and dedicated job placement services.
- Professional veterinary associations should actively promote the benefits of a career in FSVM to all constituencies with an emphasis on how careers in this area provide meaningful work of importance to the nation and society that allows veterinarians to fully use their veterinary medical training.
- Professional veterinary medical associations should formally establish programs that encourage their members to become involved with high school students in group presentations or 1-on-1 mentoring to provide early exposure to careers in FSVM to potential veterinary students prior to their enrollment in undergraduate college courses.
- Veterinary schools should provide courses during the first year of the veterinary medical curriculum that cover the basic tenets of production animal medicine to provide early exposure to veterinary students who lack this experience.
- Government, industry, and professional associations should actively communicate with veterinary students regarding job opportunities available in their respective areas for those interested in a career in FSVM.

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- a. Copies of the surveys are available from the authors by request.
  - b. SPSS, version 13.0, SPSS Inc, Chicago, Ill.
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## Appendix

Selected single items for demographic and career decisions included in the regression analysis.

Construct	Specific item from survey
Companion animal orientation	I believe we should treat all sick animals no matter what the cost.
Experience with food animals	Food animal career experience and knowledge comprising 6 items.
Significant other	Presence or absence of a significant other.
Gender	Gender.
Prestige in a career in companion animal medicine	A veterinary career in small (companion) animal medicine is very prestigious.
Salary concerns	The lifestyle I want to lead requires that I make much more than the average veterinarian.
Veterinary school influences	My experiences while in veterinary medical school have positively influenced the type of work I want to do in my career.
Job availability	I feel very secure about the future demand for my chosen veterinary occupational area.
Mentorship	I value a strong mentorship-training program in my first veterinary job.
Age	What is your current age?
Size of community	What is the size of the community in which you spent the majority of your childhood?
Childhood community size	What is the size of the community where you would ideally like to live?
Desired community size	