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Shortage of Rural Veterinarians: Real or Perceived?

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Shortage of Rural Veterinarians: Real or Perceived?

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The Nature of the Shortage of Veterinarians

Concerns about lack of available jobs in rural veterinary practice (RVP) and ironically difficulties attracting new veterinarians are commonly expressed within the veterinary community. Reports on supply and demand for rural veterinarians have produced conflicting results. A 1990's economic study forecasted a 3.0% increase in available veterinarians in large animal private practice and a 1.7% decrease in demand from 1997 to 2015.¹ However, a later study forecasted a shortage of food supply veterinary medicine (FSVM) veterinarians from 2004 to 2016 ranging from 0.1% (poultry veterinarians) to 6.9% (federal animal health), with mixed food animal practice at 6.6%.²

The apparent disparity between the estimates of demand and supply may be due to the assumption that large animal veterinarians, food animal veterinarians, FSVM veterinarians and rural veterinarians are all the same. Our recent survey, focusing on factors that influence veterinarians to choose to enter and leave rural veterinary practice (RVP), asked veterinarians and veterinary students to define RVP.³ There was no unanimous definition of RVP. The most common characteristic used to define RVP (93.4% of the 1,128 respondents) was that agriculture was considered "a significant part of the local economy." Emphasis on large animal veterinary services was considered inherent to RVP by only 33.2% of respondents, and emphasis on food

animals by only 11.0%. Therefore, studies focused solely on food animal veterinarians or veterinarians working in FSVM should not be used as proxy to determine the magnitude of the shortage of rural veterinarians, or solutions to the problem.

A structured approach to identify options to address the shortage of rural veterinarians should explore several areas, including; who is more likely to develop an interest in RVP, when the interest is developed, what factors are most influential in choosing a career in RVP, and why some veterinarians leave RVP. Our assumption is that RVP encompasses general clinical practice with all animal species including farm animals. Because many Americans own companion animals and therefore feel comfortable working with those species, much of the emphasis in this manuscript will be dedicated to experience with farm animals as a limitation or encouragement for working in RVP.

When Does Interest in RVP Develop?

It has generally been assumed that interest in veterinary medicine develops at an early age. Consequently, efforts to increase interest in veterinary medicine among youth often target individuals in grade school and high school, rather than college. Career days and events such as Michigan State University's previously held Vet Camp⁴ are generally aimed at youth. It is important to consider that some of the efforts at an early age may actually discourage youth from pursuing a veterinary education because early exposure to potentially gruesome sights such as blood, surgery and euthanasia without proper preparation may actually "*gross the child out*" rather than foster an interest in veterinary medicine.

Interest in RVP may develop along the same time line as interest in veterinary medicine. However, our study showed that 34.1% of respondents became interested in RVP during college or veterinary school, rather than earlier. Furthermore, 46.7% of veterinarians who responded noted that exposure to RVP in veterinary school was an important factor in their interest in pursuing a career in RVP.⁵ There was no difference between genders, but as we move through the generations (Silent generation to Baby Boomers to Generation X and Generation Y) it appears that interest in RVP develops later in their education, possibly because their first exposure to farm animals happens later in life. These results have important implications for veterinary education and curriculum planning.

It was interesting to discover that youth programs focused on early exposure to agriculture and farm animals such as 4-H and FFA were assigned the lowest importance scores when respondents identified reasons for developing an interest in RVP.^{6,7} A possible explanation for this lack of importance may be that those individuals that participated in 4-H and FFA activities did so because they were already interested in farm animal projects and wanted to expand their knowledge base. Therefore, these individuals would have probably given more importance to another factor such as exposure through parents or family members. These programs seem to provide some young individuals with much needed hands-on experience with farm animals and thus their potential effect in enforcing a choice in RVP should not be ignored. However, it should also be noted that for multiple reasons, both 4-H⁸ and FFA⁹ have diversified their activities from animal projects.

How Can We Get More Veterinary Students Interested in RVP?

The exodus of the U.S. population from rural America to more urban areas results in a lack of exposure to farm animals for many veterinary school applicants. To encourage an interest in RVP, veterinary schools can provide positive exposure to rural practice, farm animals and agricultural activities early in the veterinary curriculum. Students can work on projects at university farms, be partnered with local rural veterinarians, or become involved with veterinarians in activities such as agricultural expositions, county and state fairs, and public educational activities such as farm days, and animal birthing exhibits. The inclusion of these experiences during veterinary school is a necessary change to expose students of the young generations to farm animals compared to previous generations where most students came with an undergraduate education in animal science that provided in-depth and hands on exposure to farm animals. For many students, the animal science courses represent the only hands-on experiences with farm animal species they receive before entering veterinary school. Therefore, exposure to farm animals may be practically nonexistent in students applying to professional veterinary programs that do not require coursework in animal sciences as a pre-requisite to apply for veterinary school. A degree in Animal Sciences can provide an excellent undergraduate education and increase interest and confidence of students who may not have grown up in a production animal setting. However, as the population shifts away from agriculture, Animal Science departments have also adapted to meet the increased interest in animal behavior, welfare, equine and companion animal sciences. The lack of exposure during childhood and undergraduate school seems to result in having to train veterinary students in basic farm animal husbandry during the veterinary curriculum, thereby reducing time available to teach veterinary medicine of farm animals. This is a common frustration of faculty members who teach disciplines in veterinary school related to farm animals.

Veterinary schools have a responsibility to expose students in a positive way to all aspects of the profession. The majority of didactic and clinical curriculum topics in veterinary school are centered on companion animals. Schools should actively encourage students to obtain a broad-based multi-species exposure and be open to the possibilities of practice in a rural veterinary area. Recently many veterinary schools have adopted a tracking program to offer more focused training on specific disciplines within veterinary medicine (companion, equine, etc.). However, the increased focus on specialization decreases exposure of students to all aspects of veterinary medicine and may hinder students from changing their career tracks and exploring other options as they progress through veterinary school.

Veterinary schools, veterinarians and mentors should strive to convey to the student that the possibilities are limitless – that their career really is constrained only by their imagination. One cannot ignore the potential impact of a single positive or negative experience, comment, or animal interaction. All students are vulnerable to negative comments. For example, communicating to a young woman she is “too short” for dairy work, “not strong enough” to do beef work, or “the really smart people do small animal work” can be the event that changes the mind of an individual who otherwise could have become an excellent rural veterinarian. The increasing number of female veterinarians in private practice and as academic faculty involved with RVP may serve as role models to students that are considering this type of practice but are hesitant about it being a viable career option.

Factors that Influence Entering and Leaving RVP

It is not enough to just attract veterinary students into RVP; they need both professional and personal fulfillment in order to remain in RVP. Retaining veterinarians in RVP requires recognition that personal and professional needs and priorities change over time. Although the demographics of new graduates are diverse, the majority of graduates are still young adults, probably acquiring their first professional employment. Young adults tend to be more adventurous in their choices knowing that they have time to experiment with life and still have the ability to compensate if things do not work out. When considering their first job in RVP, our recent survey¹⁰ reported that practice atmosphere (79.7%) and practice location (79.6%) were ranked as most important factors, followed by caseload and variety (68.2%), mentorship (57.6%), quality of facilities and equipment (53.9%), and potential for practice ownership (50.1%). Less than 50% of respondents rated family concerns, salary, benefits, emergency duty, insurance, or time off as being of high importance. However, most of these latter factors were ranked as of high importance when deciding to leave RVP.¹¹

It is very likely that the priorities of veterinarians change between acceptance of a position in RVP and leaving RVP. New graduates failing to adequately consider some of these factors when accepting a job may later find these factors are subpar (i.e. low salary, too much emergency duty, inflexibility for time off, etc.). In order to retain veterinarians in RVP, employers need to understand why and when priorities change and what they can do to adapt to changing priorities. Obviously, for many young new graduates available starting salaries are acceptable even though they may be lower than other professional careers. Many veterinary students have lived on a tight budget and, and, thus, see starting salaries as a step up in living style. However, new veterinarians are rapidly faced with ever changing demands on their new income. Shortly after graduation student loan repayment begins and can challenge new graduates if these expenses were not properly considered beforehand. Other financial challenges that new veterinarians may not have considered before include health, life and property insurance, retirement savings, child rearing, and costs of potential practice ownership.

Salaries in RVP

It is commonly assumed that new graduates cost a veterinary practice more than they return. Mentoring new graduates requires time from the mentor that cannot be used to produce revenue for the practice. Additionally, many new graduates will change jobs after one year. This paradigm may lead many practice owners to choose not to invest fully in new graduates because they do not feel that the return on investment is worthwhile; especially if they anticipate that the new graduate will not remain in the practice long-term. However, practice owners should consider new graduates as an investment that should return value to the practice in the future. An increase in salary after the new graduate is acclimated to practice and is able to begin returning value to the practice would deliver the message to the new graduate that his/her work is valuable, that their efforts are appreciated and noticed, and that there may be more possibilities such as practice ownership. Otherwise new veterinarians may make a decision based on thoughts such as “*I am only making this much now and I could make that much more if I go somewhere else*”.

Although currently lower starting salaries do not appear to be a reason for veterinarians to not seek a career in RVP, practice owners should keep in mind that low salaries may discourage young people from going to veterinary school to begin with. Many veterinarians feel any increase in fees to offset increasing starting salaries will cause them to lose clients and, therefore, income. However, in many areas, there are practices that struggle while others thrive, and personal observations suggest that more often than not those that thrive are not the ones with the lowest fees. Although each practice is different, a modification of fees may be necessary to provide for a more generous salary for new associates. Increases in fees are a normal business practice in any profession and are generally understood and accepted by clientele.

Time Off

From a personal aspect, once out of veterinary school, new graduates may plan on having increased free time to pursue recreational activities and possibly raise a family. Eighty-nine percent of respondents to our survey ranked a rural lifestyle as a highly important factor for pursuing a career in RVP.¹² That lifestyle can only be realized when sufficient time and resources are made available.

Results of our survey showed that too much emergency duty and inadequate time off were the highest ranked reasons for leaving RVP.¹³ Thus, providing adequate time off is important to retain new graduates. Young generations may have a different perspective on life than older generations, and as a result conflicts may arise. Generational shifts do not mean that younger generations should be allowed to neglect a commitment to their job or fail to sustain a strong work ethic. However, practice owners cannot expect them to sacrifice themselves or their families for the job as some of the earlier generations may have done. The balance between work and personal life is different for every individual, and therefore needs to be negotiated individually.

Employers may think of creative ways to satisfy time off for their veterinarians. Compared to urban practice, RVP work has some seasonality because of the dependence on agriculture. Employers in RVP can use this to their benefit in allowing some longer periods of time off during periods of low demand time. For example, many practices are open on Saturdays throughout the year. During slow times of the year closing the office or reducing the number of veterinarians required to be in the office on Saturdays would give associates the ability to pursue personal interests. This is a tremendous benefit of the rural lifestyle. Veterinarians that are raising a family may desire more flexibility in time off to attend family activities such as little league games or school concerts. Flexibility to schedule work hours and time off may be of major importance in future years as younger generations tend to desire spending more time with their families.

Practice Atmosphere

Practice owners are key to setting the tone for the practice atmosphere and attitude that the members of the practice adopt. A practice led by a person who is unhappy or burned-out is a very different place compared to a practice in which the staff enjoys coming to work every day. It is likely that while most people can recognize an unhealthy work environment, many are

unaware that their attitudes are pivotal to the well-being of their colleagues and employees, even to the point of causing people to seek another position. Additionally, new graduates should understand that a bad experience with a new graduate may negatively affect the potential of a practice owner to offer a job to more new graduates in the future.

Successful Retention of Rural Veterinarians

Unpublished results from our survey include answers to the following open-ended question posed to participants: “What would you recommend practice owners do to increase retention of veterinarians in rural veterinary practice?” Respondents answered this query with a host of helpful and sage advice that is summarized in categories depicted in [Figure 1](#). Less than 5% of respondents were defeatists, suggesting there is no solution to the shortage of rural veterinarians, although some of their comments revealed several areas of interest. For example:

“Work humane hours. Train your clients not to call after hours about non-emergencies. Practice at current levels of expertise, not 20 years ago. Stop using off label drugs in an illegal manner. Nip personnel problems in the bud; tolerance is as good as encouragement. If you provide equipment or a truck, make sure it is in good repair and of good quality--driving a jalopy and using duct taped tools does not make one feel like a valued team member. It is better to be the "expensive vet" in town than the "cheap vet"; I have worked for both and complaints about cost of services are at least 10 times more common at the "cheap" practice. Client satisfaction is also much lower at the "cheap" practice (for psychological reasons, I suspect).”

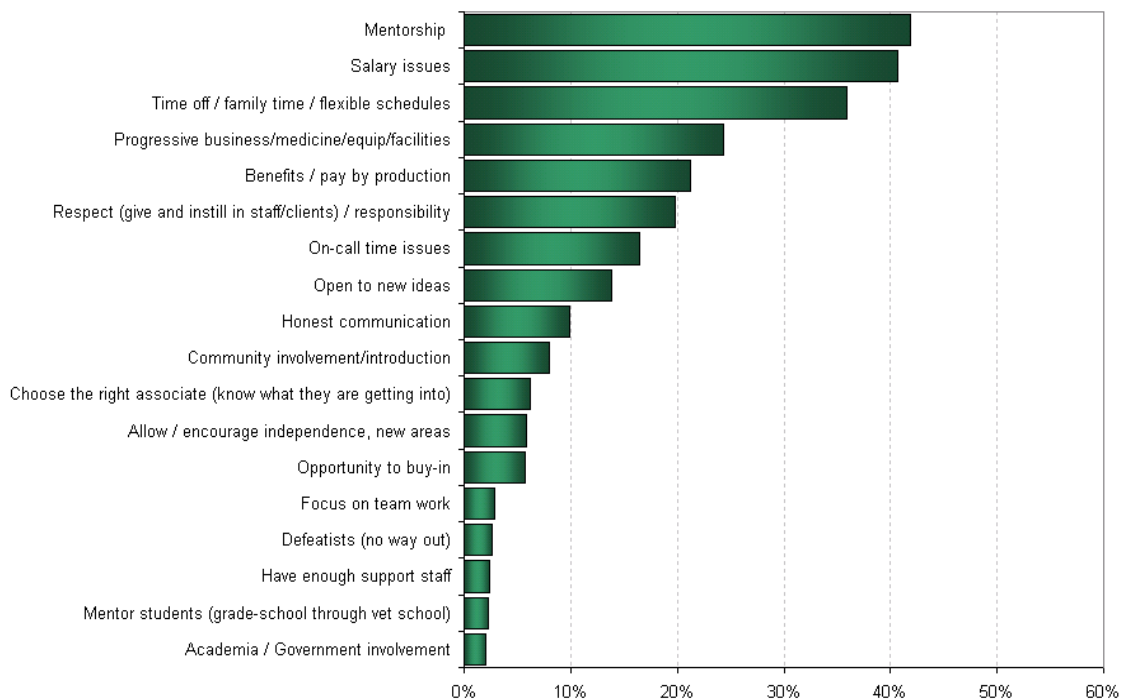


Figure 1. Proportion of respondents that recommended various strategies for practice owners to retain veterinarians in RVP.

Clearly, respondents held practice owners responsible for mentorship, salary issues and time off. After all, owners write the checks, schedule and allocate on-call time and office hours. Mentorship was the factor most commonly mentioned as an area of attention from practice owners to retain new graduates.

Mentorship

Mentorship is a recognized critical factor influencing recruitment and retention of veterinarians.^{14,15,16} However, mentorship can be interpreted in many ways. According to answers to the open-ended survey questions, it seemed that new graduates had the perception that mentorship meant further veterinary education beyond school. Here is an example comment from a respondent answering a question about why they chose not to pursue a career in RVP:

“Lack of mentoring and lack of adequate training for large animal medicine in vet school. I just felt inadequate and overwhelmed and decided to pursue an internship so that I could have better mentoring.”

In contrast, this was considered “hand-holding” by some practice owners who participated in the survey. It should be remembered that mentorship is an evolving process that is tailored by the participants into a relationship that is as individual as the parties involved—one protégé may want a great deal of support, where another may want to be more independent. Effective communication is necessary between practice owners and prospective employees to determine the level and range of mentorship willing to be offered and desired, respectively.

Many employers may not consider that they can also have a mentorship role in enhancing the new graduates’ integration into the community. One author’s personal observation of a “job fair” at which veterinarians were asked to describe their concept of mentoring suggests that greater emphasis is placed on clinical skills and client communication as opposed to less tangible things that could increase retention in RVP such as integration into the practice and the community. Practice owners may need to consider a broader view of mentorship and place greater emphasis on less traditional factors that in turn are considered important by those choosing a career in RVP.

Community Integration

Among the insightful recommendations in the survey were comments such as:

“...do whatever it takes to immerse them in the community...”

“...Introduce new associates to community members and have them become a valuable member of community = harder to leave practice!...”

“...As hard as that is sometimes, associates will stay places they make attachments to. If they spend all night at home and have difficulty getting a foothold in the community, the associate will leave....”

“Integrate them into both the practice and the community...”

These comments refer to the degree to which a new veterinarian is embedded in a job, which has been described as the “...*combined forces that keep a person from leaving his or her job*”.¹⁷ This broad-based concept includes multiple factors such as community involvement, personal relationships, marital status, and the quality of human connections both on and off the job. Several recent reports have demonstrated that the more embedded or linked an employee is within their community, the more likely they are to be retained.^{18,19,20} Since many veterinarians cite “rural lifestyle” as a key reason for pursuing employment in a rural practice, it is important that the associate feels a sense of belonging within the rural community. This doesn’t necessarily need to be accomplished by formal introductions but may require some concerted efforts, including the aforementioned flexibility in time off to be successful.

To be successful in facilitating community involvement, the employer must invest the time it takes to get to know the employee. It is critical that they have some knowledge of their employee’s interests outside of veterinary medicine. If they enjoy working with kids, consider suggesting their participation on a County Fair committee, or helping with school presentations as part of their job in the practice (if possible, during business hours). If they enjoy reading, introduce them to the chair of the library board. If they are community service oriented, you can encourage them to become a member of community service organizations such as Kiwanis. Involvement in community activities may increase the level to which a new veterinarian is embedded in a job, decompress the daily work routine, and increase the likelihood that the employee will remain in the practice.

Veterinarians in rural practice are often respected members of the community whose opinions and insight are valued. It is important that the practice owner make a conscious effort to demonstrate approval and acceptance of new employees. For example, the practice owner may positively influence perception and acceptance of a new veterinarian by complementing him/her and expressing approval when communicating with clients. Inclusion of the new veterinarian among the practice owners’ social circle, at least temporarily, may also be helpful in increasing the strength of an embedded job. By laying the groundwork for the employee to successfully develop and establish a place in the community, employers may be able to improve retention of new rural veterinarians.

Unmet Expectations

Similar to the question of advice for practice owners, our survey asked “*What would be your advice to soon-to-graduate veterinary students regarding selecting a job in rural veterinary practice?*” Previously unpublished responses to this open-ended question were summarized into several categories ([Figure 2](#)).

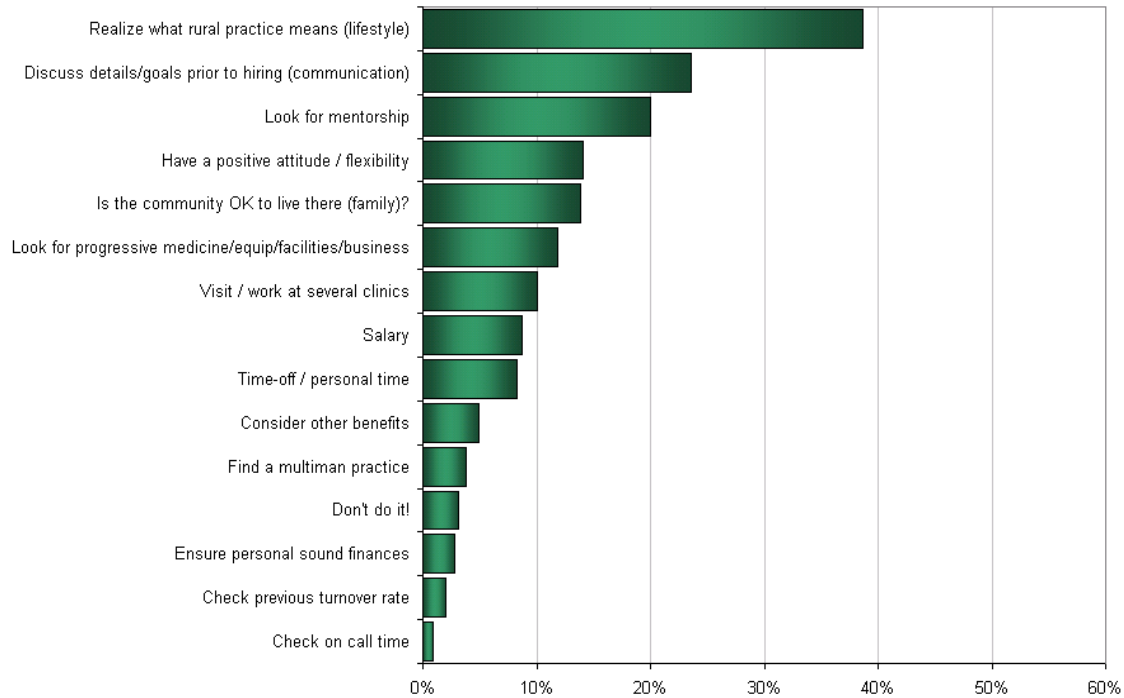


Figure 2. Proportion of respondents that recommended various strategies soon-to-graduate veterinary students in selecting a job in RVP.

Many veterinary students have never had a “real job”, and may not have the savvy to fully understand the requirements of their “first job”. Consequently, they can be blindsided by unexpected and often unpleasant situations such as personal conflicts, especially with support personnel. Rural practice is different in many ways from urban and suburban counterparts. One person might enjoy the open spaces and client relationships, where another might feel isolated and bored. The advice to learn what rural practice means is sound. Communication is encouraged between an applicant and an employer during the hiring process and afterward to ensure that both parties have their expectations met.²¹

Services for Sale

Another important factor that influences retention in RVP is the availability of clients willing to pay the cost of a veterinarian to provide services in a rural area. It is common for veterinary practices to receive calls from clients seeking veterinary advice for their animal, herd, or flock; but they are unwilling to pay for the professional service performed by a veterinarian or even for the phone consultation. Often they rely on the veterinarian’s love for animals and use the “guilt card,” hoping the veterinarian will feel sorry for the animal and treat it for free or at a reduced rate. The following is a comment from a veterinarian who left RVP:

“In my experience, I found that the clients at the rural clinic were not willing/able to provide their pets with the kind of quality care that I want to practice. ...Also, since the other doctors and all of the staff were “rural” people themselves, they had some of the same attitudes as the clients. I found it very challenging to recommend quality medicine

and surgery to my clients when my staff could not (or would not) provide the same care to their [own] pets.”

Instead of bemoaning the fact that some clients may not want to spend the money for an expensive work up, practice owners can emphasize that these cases provide new graduates with the opportunity to rely on and enhance their clinical skills, while still providing viable options for the client. The true art of veterinary medicine is obtained over time as new graduates learn to trust their clinical skills rather than relying heavily on laboratory tests. Even if clients are willing to pay, with the exodus of the American population to more urban areas, there may not be enough population density of certain animal species to provide an adequate workload for a veterinarian to make a living without having to cover an extensive geographical area. Therefore, it is critical that rural veterinarians are capable of treating all animal species that may be in an area to be able to generate case load and income. Veterinary schools offering specializations or tracking should ensure that a more broad-based option is available for students interested in RVP.

Areas that Need Further Exploration

Based on our results and the fact that RVP has not been previously well defined, a more in-depth investigation into whether or not an actual shortage of RVP jobs exists is needed. In addition, more work is needed to accurately identify the potential factors limiting availability of RVP jobs. Sufficient numbers of RVP jobs may be available but personal constraints that are considered of high importance may influence potential RVP veterinarians to seek employment in other practice areas. For example, the actual number of RVP jobs in a given state may be in excess of interested students but other unknown or less tangible factors such as restricted availability for spouse employment may influence whether or not a job in RVP is truly “available” to that veterinarian. Another example may be that an RVP position exists in a given geographical area desirable to the potential associate, but the offered salary (although adequate to the job and region) may not be enough for the new veterinarian to fulfill his/her financial obligations. In summary, each individual has a unique set of priorities that need to be met and there may be other priorities that rank higher than finding a job in RVP, especially for new graduates. The influence of less apparent factors or underlying “restrictions” on the perception of RVP job availability should be more closely studied.

Rural veterinarians, veterinary schools and policy makers should focus recruitment of new RVP veterinarians on young individuals (both urban and rural) as well as veterinary students during their professional education. Veterinary schools should ensure that curricula, available faculty and resource allocation are adequate to serve the interests of students seeking a career in RVP. New graduates need to fully understand what a career in RVP versus that of urban practice entails, or they may become dissatisfied and frustrated if it does not meet their needs and expectations. Many students accepting jobs in urban practices may find greater satisfaction in rural practice if they realized the potential benefits of that choice. Practice owners in RVP seeking to acquire and retain a good new graduate should consider how they will mentor the individual in veterinary medicine and the intangible aspects of integration into the community. In addition, employers should evaluate how the practice can meet the needs of new associates

regarding income and work schedule. RVP can be a very satisfying career and lifestyle but good communication and relationships are essential both in the practice and the community.

End Notes: Villarroel, Aurora, Stephen R. McDonald, William L. Walker, Lana Kaiser, Reneé D. Dewell, Grant A. Dewell. "Shortage of Rural Veterinarians: Real or Perceived?" [Online Journal of Rural Research & Policy](#) (5.7, 2010).

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Dr. Villarroel grew up on a small Holstein dairy in Leon (Spain), where she developed her love for dairy cattle. She received her DVM from the University of Las Palmas de Gran Canaria (Spain) in 1996. After graduation she worked as the director of animal operations on the largest dairy in Spain (Tauste Ganadera, S.A.) for 3 years. In the year 2000 Dr. Villarroel started a residency in Food Animal Reproduction and Herd Health at U.C. Davis, and as part of this residency completed the MPVM (Masters in Preventive Veterinary Medicine) in 2002 with a focus on Herd Health. She discovered her passion for teaching during this time, and planned on working in academia. After finishing the residency in 2003, she completed her Ph.D. in Epidemiology at Colorado State University with a focus on antimicrobial use in dairy cattle and its association with antimicrobial resistance. She joined the faculty at Oregon State University in 2006 working as ambulatory clinician in the Rural Veterinary Practice (RVP) service of the veterinary teaching Hospital, and part-time Extension Veterinarian. Dr. Villarroel is a member of the American College of Veterinary Preventive Medicine (ACVPM) and her research interest is in factors that naturally affect dairy cattle health and reproduction evaluated by remote sensor monitoring systems.



Stephen R. McDonald ([back to top](#))

I was born in 1948 in Holiday, Texas, which is a small oilfield/ranching town in North-Central Texas. I was exposed to both ranching and oilfield work at an early age. My mother and grandmother were both teachers, and from them I acquired my love of learning. The male members of my family taught me the value of diligence and perseverance.

From 1966 to 1969, I served in the United States Marine Corps. Here I learned the value of teamwork, and I first got the notion that with the right attitude, one can accomplish just about anything with nearly nothing.

After my military service, I came home and was employed by various farm and ranch enterprises.

From 1976 to 1982 I founded and ran a farm and ranch construction company specializing in erecting steel buildings, steel pens, and cattle working facilities.

During this time I decided to complete my college education. I applied and was accepted into veterinary college. I graduated from Texas A&M veterinary college in 1986.



Polly, my wife, who is also a veterinarian, and I started a mixed animal practice in Henrietta, Texas. This is a sparsely populated area of North Central Texas, which had no veterinary service prior to our establishing here. We have been here since 1988.

I am a 2000 graduate of the Beef Cattle Production Management Course at Clay Center, Nebraska (An affiliate of the University of Nebraska).

I am a member of American Veterinary Medical Association, Texas Veterinary Medical Association, and the American Association of Bovine Practitioners.

I am a founding member of the Academy of Rural Veterinarians.

I am a certified Beef Quality Assurance veterinarian for the Texas and Southwestern Cattle Raisers Association

I am on the board of directors for the Clay County Animal Shelter

William L. Walker ([back to top](#))

After graduating in 1999 from the Virginia-Maryland Regional College of Veterinary Medicine, Dr. Walker practiced in California at Lander Veterinary Clinic, Inc. until 2004, serving as both an associate veterinarian and partner. From 2004 to 2005, Dr. Walker was employed in the Department of Population Health and Reproduction at the University of California at Davis as a clinician in the Food Animal Reproduction and Herd Health service. Dr. Walker is currently completing a Doctor of Philosophy degree in Veterinary Preventive Medicine in the Department of Veterinary Preventive Medicine at the Ohio State University. His research focuses on the epidemiology of infectious disease in preweaned dairy calves reared on calf ranches.



Lana Kaiser ([back to top](#))

Lana Kaiser, born in Buffalo, NY, received a BA in English from SUNY at Buffalo with plans to be a poet – not a financially viable career. She is a graduate of Michigan State College of Human Medicine, a Board Certified (Human) Internist, and was Professor in the Department of Medicine at MSU with a research focus on cardiovascular pathophysiology. A 1995 graduate of the College of Veterinary Medicine, MSU she resides on a farm in Mason, MI where she raises Maine-Anjou cattle. She has a beef cattle practice, consults for several agricultural entities, and is involved in issues of animal behavior and welfare at the county, state and national level.

**Reneé D. Dewell** ([back to top](#))

Dr. Reneé Dewell is on faculty of the Iowa State University College of Veterinary Medicine, serving as a Clinician in the Veterinary Diagnostic and Production Animal Medicine and a Veterinary Specialist in the Center for Food Security and Public Health. Dewell received her degrees from the Department of Animal Sciences at Texas A&M University (BS), DVM from Colorado State University, and completed her internship and Masters work at the University of Nebraska-Lincoln. She is also an active member of the American Association of Bovine Practitioners, American Veterinary Medical Association and the National Veterinary Medical Response Team.



Grant A. Dewell ([back to top](#))

Dr. Grant Dewell received his DVM from Colorado State University in 1993 and was in a primarily cow-calf practice in central South Dakota for 2 years. Following practice, he completed a Master's degree in Agriculture Economics at Colorado State University. Dr. Dewell then joined the faculty at the University of Nebraska's Great Plains Veterinary Education Center, in Clay Center, Nebraska for four years. He then returned to Colorado State University to complete a Ph.D. in Epidemiology with a focus on pre-harvest food safety in feedlot cattle. He is currently the Beef Cattle Extension Veterinarian at Iowa State University. Dr. Dewell's research interests are in pre-harvest food safety of beef cattle with a primary focus on E. coli O157, health management of feedlot cattle, and economic considerations for beef production operations.

