Addressing the Persistent Shortage of Food Animal Veterinarians and Its Impact on Rural Communities

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EXECUTIVE SUMMARY

Food animal veterinarians are vital to maintaining a safe food supply in the United States and they play a critical role in protecting public health. They also contribute to the economic prosperity of their communities. Yet the United States is facing an alarming shortfall of food animal veterinarians, especially in rural areas.

The United States Department of Agriculture (USDA) has identified over 200 shortage areas (unfilled veterinarian positions) in 2021 that cover over 500 counties, many of which are rural. Food animal veterinarian positions in two-thirds of these shortage areas have remained vacant in the past 5 years.

While this decline in rural food animal veterinarians is not new, it has now reached such a critically low point that urgent action is required. Only 3-4% of new veterinary graduates have entered food animal-related practice over the past 20 years. This does not bode well for the future, as food animal veterinarians currently make up about 5% of all veterinarians in the U.S. Without enough food animal veterinarians and reliable access to the services they provide, **3.7 million livestock jobs are at stake,** as well as overall public health and food safety.

Much of the decline in food animal veterinarians stems from three key shifts: **A significant increase in education debt obtained by veterinary students, which has outpaced their potential earnings. A flat, if not slightly declining, trend in the number of veterinary students who pursue food animal veterinary practice after graduation. A rapidly growing companion animal sector that is outpacing the earning potential of other fields of veterinary medicine.**

While there are several programs that address the issue of education debt, they are severely lacking. USDA's Veterinary Medicine Loan Repayment Program (VMLRP), which provides debt repayments to veterinary graduates who practice in shortage areas, has not received sufficient funding to address the growing number of shortage areas and increased levels of veterinary student debt. Similar issues arise with programs such as the Veterinary Services Grant Program (VSGP), which provides funds to expand food animal veterinary businesses.

Opportunities exist at the intersection of federal, state, and higher learning institutions to address shortages. In the short term, providing solutions to the debt problem is paramount.

In the long term, policy interventions should focus on creating pathways for students from rural backgrounds and veterinary education programs to become food animal veterinarians.

Policy solutions should:

1. **Strengthen existing debt repayment programs:**
   - Expanding funding for the VMLRP.
   - Overhauling the application criteria for the VMLRP to enable more veterinarians to participate.
   - Providing loan repayment tax-free awards to veterinarians who agree to work in the public sector and rural areas.
   - Improving methods for consistent identification of veterinary shortage areas to better target rural communities in need.
2. **Expand programs that offer business support:**
   - Expanding funding, increasing programmatic scope, and decreasing application barriers for the VSGP.
   - Establishing low-interest business loans for food animal private practices.
3. **Fund and establish programs to support a strong pipeline of veterinary students:**
   - Supporting schools by enhancing training opportunities and actively recruiting students from rural backgrounds.
   - Targeting students in post-secondary education to increase retention.

Without creating tangible solutions to the growing issue of education debt, shrinking number of rural veterinary businesses, and the lack of interest from veterinary students to pursue food animal practice, the shortage situation – and its ramifications for the U.S. food system and public health – will only continue to worsen.

INTRODUCTION

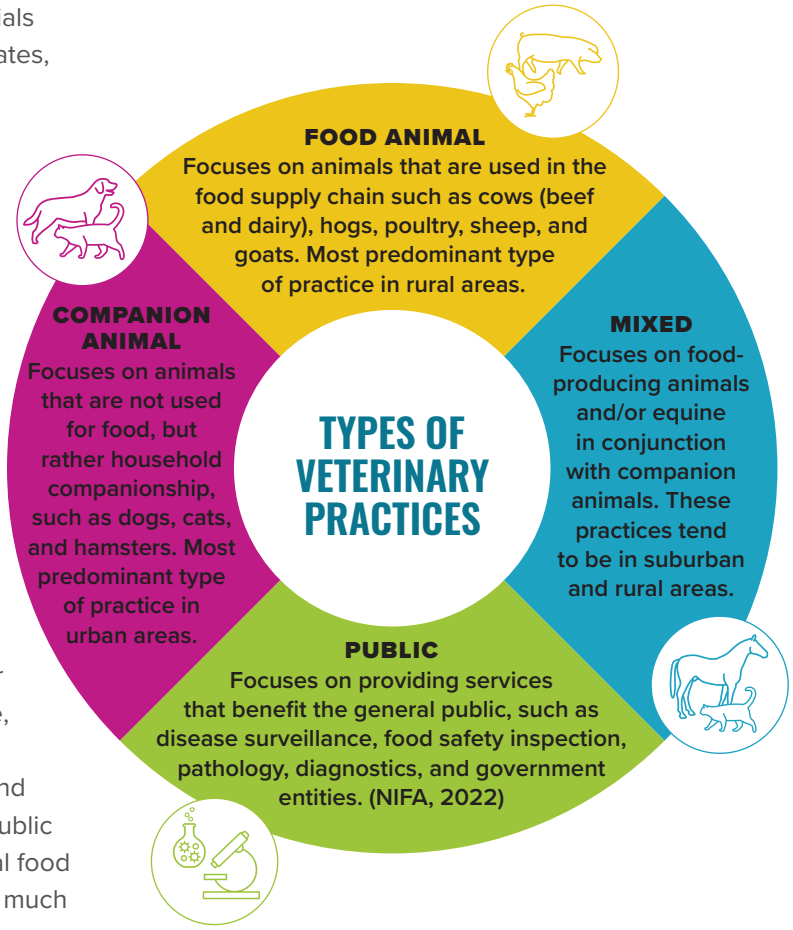
Veterinary businesses, such as clinics and diagnostic labs, serve numerous functions for rural communities and the larger U.S. population. However, over the last 30 years, fewer veterinarians are in rural areas (Wang et al., 2016). In fact, in 2020 only 11.7% of veterinary businesses resided in counties with 20,000 people or less (Data Axle, 2021). In the most rural counties, with populations less than 2,500, this number falls to a mere 2.3%.

The decline in food animal veterinarians in rural areas heightens concerns for a safe food supply; the potential for widespread animal disease outbreaks; the risk of certain diseases passing from animal to human populations; and a decline in rural community economic growth. In essence, veterinarians protect the whole of the human population, from ensuring the safety of the food we eat to preventing disease outbreaks.

Several factors are driving structural changes in the rural-urban distribution of veterinary services in the United States, including shifting demographics of students pursuing veterinary programs, rising demand for pets in urban areas, increasing amounts of debt acquired from pursuing a Doctor of Veterinary Medicine (DVM) degree, and consolidation of many food animal farms and processing facilities. Given the dwindling numbers of rural veterinary practitioners, it is imperative to evaluate current policies that aim to incentivize veterinarians to pursue rural entrepreneurship. This understanding will better inform policymakers and encourage the examination of potential changes to those policies or alternative approaches to better support and incentivize rural veterinary businesses and practitioners.

TRENDS IN FOOD ANIMAL VETERINARIANS AND CAUSES FOR SHORTAGES

Each year the USDA partners with State Animal Health Officials to identify food animal veterinary shortages in the United States, many of which are in rural areas. In general, rural areas in the U.S. have lower per capita income, higher poverty, and depend on different industries than urban areas (USDA-ERS, 2020). As such, rural areas' annual economic growth rate between 2012 and 2015 was much lower than their urban counterparts – 1.2% for rural counties compared to 1.7% for urban (St. Louis Federal Reserve Bank, 2019). Rural counties also depend much more than urban areas on financial activity conducted by government and government enterprises for real gross domestic product (GDP) growth.



As defined by the USDA, public practice veterinarians are those that work in government and diagnostic lab services in the food animal veterinarian space, such as USDA's Food Safety and Inspection Services (FSIS), State Veterinarian offices, animal health diagnostic labs, and other governmental agencies, such as the Department of Defense, USDA's Animal and Plant Health Inspection Service (APHIS), USDA's Agricultural Research Service (ARS), and the Food and Drug Administration (FDA). While many shortages exist for public practice veterinarians, the number of shortage areas for rural food animal veterinarians across the public and private sectors is much greater (USDA-VMLRP, 2020).

Food animal veterinarians currently make up about 5% of the total veterinarian population, a stark decline from 40 years ago.

Since 2001, the number of new veterinarians pursuing food animal and mixed animal practices has remained relatively flat. For food animal exclusive and predominant practice areas, the percentage of all new graduates entering this area has been about 3-4% every year over the past 20 years (AVMA, 2021). This does not bode well, given that food animal veterinarians currently make up about 5% of the total veterinarian population. **There is likely to be more decline in food animal veterinarians in the near future as older veterinarians retire and leave the industry and the number of graduates remains below replacement rate.** This is a stark difference compared to 40 years ago, when the largest proportion of veterinarians (about 40%) were focused on food animal veterinary medicine (Neill et al., 2018).

Moreover, less than 2% of all veterinary graduates today are working in a public role with state, local, or federal government positions (AVMA, 2021). Much of the lack of growth in food animal and public practices has been due to the increase in students pursuing companion animal practice, where much of the industry growth is occurring (IBISworld, 2021; AVMA, 2021).

Demand for pets has grown annually by about 1.4% over the past 5 years (IBISWorld, 2021). Moreover, pet owners are demanding more frequent and higher levels of care, as is evident from data on pet healthcare spending and the extended life of pets (Einav et al., 2017).

The recruitment and retention of food animal veterinarians has been a prominent public policy issue in recent decades. The most cited factors for shortages of veterinarians in rural areas include high education debt, challenges of rural life, high on-call demand as compared with other practice types, lack of mentorship availability, and difficulty acquiring necessary resources to establish a practice (CAST, 2020). Increases in education debt have been accompanied by increases in stress/burnout, with newer veterinarians feeling as though they cannot financially afford to start their own business, and the pursuit of higher paying alternatives. As such, it is important to have a concrete understanding of the current situation and potential solutions to the shortfall of food animal veterinarians throughout the United States.

DEFINING THE CURRENT SITUATION

As previously stated, the decline in food animal veterinarians is the result of fewer new graduates choosing food/mixed animal practice in favor of companion practice for better pay and quality of life. The need for food animal veterinarians has also increased in recent years with the introduction of additional policy measures such as the Food Safety Modernization Act and changes to the Veterinary Feed Directive (Tack et al., 2018). Each of these new policies requires veterinarians to play an integral part in maintaining the health of animal populations, as they must be the ones to prescribe antibiotics and ensure that farmers adhere to the enhanced food safety measures (Wynne et al., 2017). This creates additional costs and time constraints on small and medium-sized independent livestock producers, as a veterinarian-client-patient relationship must be established to meet these new regulations.

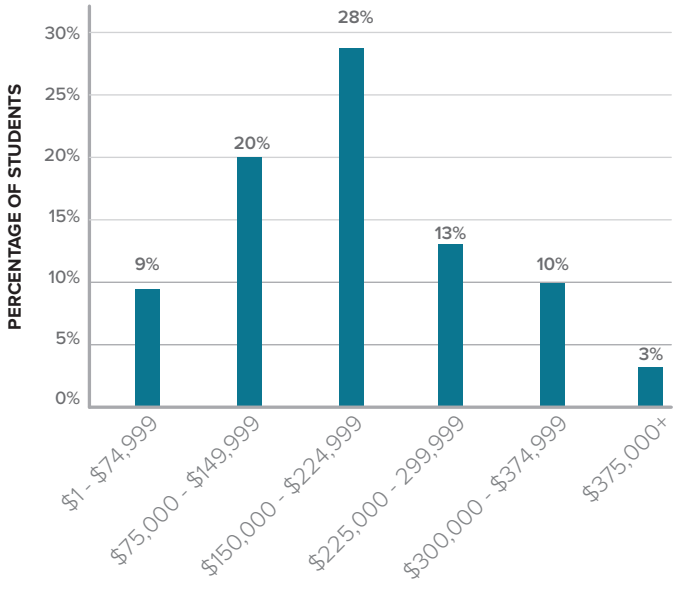
In addition, there is a continued need for more food animal veterinarians who contribute to the public and social welfare of society – including those that provide diagnostic lab services. Debt levels, as compared to potential income, are a major concern for public practice veterinarians, as they do not receive production-based compensation like private veterinarians do. Further, non-financial barriers to the recruitment and retention of public veterinarians include lack of awareness and training opportunities (CAST, 2020). However, the most significant barrier is the annual income gap between public and private food animal veterinarians.

The majority of students completing veterinary education are from urban and suburban areas (Greenhill, 2015). Moreover, research has shown that veterinarians often return to the areas in which they grew up (Greenhill, 2015; Neill, et al., 2017). Thus, without targeted admission of rural students, it is likely that the decline in rural food animal veterinarians will continue. This trend in veterinary student composition is driven by more than debt and plays a role in the general decline in food animal veterinarians and their future supply.

Trends in Veterinary Student Demographics, Debt, and Income

In addition to the issue of students pursuing non-farm animal careers upon graduation, there is a large concern about rising debt-to-income ratios for Doctor of Veterinary Medicine graduates. Veterinary student debt varies significantly across educational programs, while starting wages are much less variable. Median debt ranges from $84,262 to $370,500 across all schools in the U.S., with students at newer programs (such as Midwestern University in Arizona and Lincoln Memorial University in Tennessee) at the top end of the debt range along with Western University in California and Tuskegee University in Alabama (AVMA, 2021). **The 2020 mean debt for all those who take on education debt (not including the 17% of students who did not have any debt) was $188,853, with 41% of those students having debt of $200,000 or more.** Given that veterinarians entering the workforce can expect a median full-time income ranging from $84,000 to $110,000, depending on the practice type, **the average debt-to-annual income ratio for new veterinarians is about 2.6.**

Figure 1. Veterinary Education Debt



17% of veterinary students graduate with $0 debt

Source: AVMA, 2021

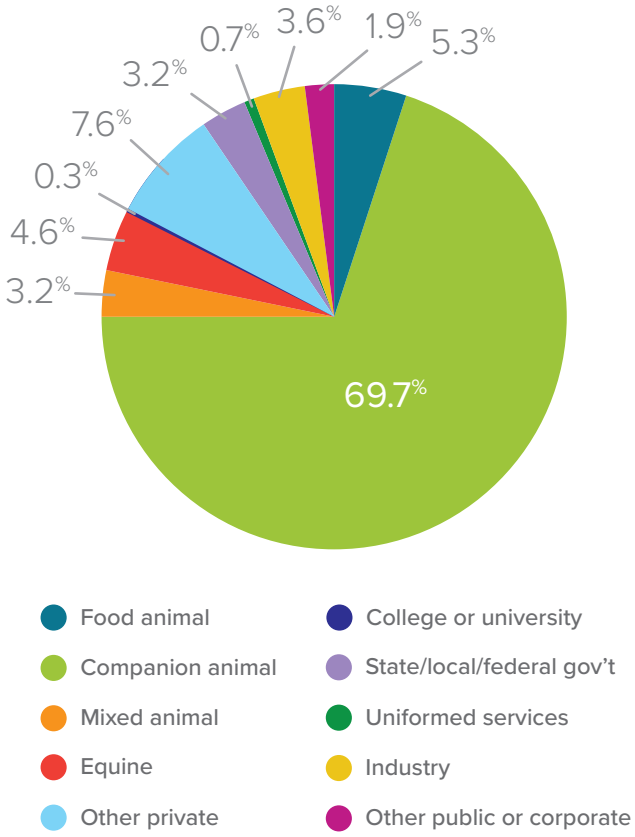
Structural Factors Contributing to a Shortage of Food Animal Veterinarians

Wang, Hennessey, and Park (2016) find that female veterinarians who typically come from urban and suburban areas are more likely to locate in areas like those they grew up in and thus are less likely to pursue food animal practice. In addition, food animal medicine is one of the least diverse areas of veterinary medicine, with most veterinarians being over 50 years of age, white, and male. Given that only 20% of American Veterinary Medical Association (AVMA) members who graduated between 2010 and 2019 were male, this has notable implications for the population of veterinarians who may want to enter food animal practice. Beyond veterinary educational shifts, there have been changes in animal agriculture and the overarching veterinary workforce that have led to changes in how rural and food animal veterinary care operates. Between 2015 and 2020, the percentage of veterinarians working in companion animal practices increased from 64.7% to 69.7% (AVMA, 2016; AVMA, 2021). For food animal veterinarians that number has grown at a lower rate, from 4.6% to 5.3% within private practice, and from 3.0% to 3.2% among those working in local, state, and federal government positions. The other practice types, as shown in Figure 2, comprise the remainder.

From historical business data (Data Axle, 2021), it was found that between 2010 and 2020 the number of rural veterinary businesses declined by 1.1% across the entire United States. Yet, according to the Bureau of Labor Statistics, demand for all veterinary labor is expected to expand by 19% by the end of the current decade and has been growing at a rapid pace over the past decade (Bureau of Labor Statistics, 2021). Part of the rural decline may be due to underlying economic conditions. For example, the average sales volume for rural veterinary businesses in 2020 was about $461,500 compared to the average for urban businesses of about $734,000 (Data Axle, 2020).

While the above revenue numbers don't account for population, cost of living, and business labor force, the economic incentives for entrepreneurial veterinarians to start a rural business are severely lacking. A lower potential revenue stream could hamper the ability to acquire a business loan, and the potential earnings in a rural area may not be enough to feasibly alleviate the education debt accumulated. Further, the increase in consolidation among concentrated animal feeding operations has led to larger herd sizes, but fewer operations, which may contribute to a lack of sufficient demand in some rural areas where smaller-scale and lower-income livestock producers often operate.

Figure 2. Veterinarian Population by Practice Type in the United States



Estimated number of veterinarians as of December 2020: **118,624**

Source: AVMA, 2021

IMPACT OF SHORTFALL

Understanding the economic contribution of veterinary medicine in rural areas is of critical importance, as there continues to be an observed decline in veterinarians working in rural areas and thus a decline in the level of economic support that veterinary services provide in those rural economies (Greenhill, 2015). In total, the U.S. veterinary industry plays a significant economic role, supporting $22 billion in direct output and 571,244 total jobs in 2020 (IMPLAN, 2021). The industry also underpins about 3.7 million jobs associated with the United States' major livestock sectors (beef and dairy cattle, poultry and eggs, and hogs), including jobs at the farm level, in transportation, and in processing facilities.

One of the more prominent livestock sectors affected by the decline in rural food animal veterinarians is the cattle industry. In a recent report, it was estimated that 50% of bovine veterinarians still have unpaid education debt 29 years after graduation (AVMA, 2017). The average amount of debt for bovine veterinarians is highest in the multistate areas with the largest amount of cattle production. This highlights the continued issue of debt and is seen as one of the main drivers of a decline in food animal veterinarians.

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When considering the economic activity that bovine food animal veterinarians in private practice contribute to regional (multistate) economies, the average direct impact is about $136 million (AVMA, 2017). On a national level, bovine veterinarians contribute almost $1.5 billion in direct economic impact. In addition, bovine veterinarians pay over $382 million in taxes to state and federal governments. A decline in the number of private food animal veterinary practices, including those that serve the cattle industry, results in large losses in employment and economic output, and has spillover declines into the real estate, restaurant, and wholesale trade sectors of the economy.

The other major livestock industry that needs veterinarians, as defined by the USDA, is the swine (hog) industry. In 2021, the majority of rural food animal shortage areas were designated as needing a veterinarian to serve the swine populations in a county (USDA-VMLRP, 2021). Other small ruminants, including the sheep and goat industries, were also shown to have a prevalent need.

In addition, public sector veterinarians are key to robust surveillance of animal disease and ensuring rigorous food safety standards are met. There are a number of traditional and non-traditional positions that help meet societal needs that are not directly paid for by the public. Such roles include USDA FSIS veterinarians who inspect meat and poultry products, monitor foreign animal disease, assist food inspectors in maintaining compliance with federal regulations, inspect egg products, and enforce animal welfare laws (USDA-FSIS, 2022). For the most part, the budgets of the agencies that employ these veterinarians are covered by user fees paid by regulated companies. In addition, each state's office of the State Veterinarian is responsible for regulating imports, transportation, and welfare of animals and animal products for its state (Noah and Ostowski, 2016). These are just a few examples of the many public agencies that employ veterinarians. Recruiting more veterinarians into the public sector is paramount to ensuring a safe food supply.

CURRENT INCENTIVES AND PROGRAMS

Despite the existence of several policies and programs that address the shortfall of food animal veterinarians, more shortage areas are identified every year and many of them remain unfilled year after year. The largest programs at the national level have helped identify where the most acute shortage areas are located. Beyond federal policies, state policies and education programs have grown in popularity as the need for food animal veterinarians has increased over the last 10-15 years. To inform recommendations on future policy interventions, it is important to understand the current array of policies and programs, including their strengths and weaknesses.

Federal Policy Initiatives

The Veterinary Medicine Loan Repayment Program (VMLRP) was established by Congress in 2003 and first funded in 2005 to address the need for more food animal veterinarians. It has been used to attract more food animal veterinarians to practice in rural areas by paying back part of their education loans if they practice in a designated shortage area and serve species needing coverage. The VMLRP is currently managed by USDA's National Institute of Food and Agriculture (NIFA) and awards applicants with loan repayment amounts proportional to their current education debt, up to $25,000 per year for three years.

In recent years, more than 200 shortage areas have been nominated annually by State Animal Health Officials and the USDA, which cover more than 500 counties. Each shortage area is classified in one of three areas:

TYPE I SHORTAGE AREAS are for Private Practice Food Animal Medicine, which require the awardee to commit to serving a minimum of 32 hours a week in food animal veterinary medicine. These shortage areas may be in urban/suburban or rural locations.

TYPE II SHORTAGE AREAS are for Rural Private Food Animal Medicine and require a minimum commitment of 12 hours a week to food animal veterinary medicine in a rural area.

TYPE III SHORTAGE AREAS are for Public Practice and require a minimum commitment of 19.6 hours a week to public practice, of which the most common service is at a diagnostic laboratory (USDA-VMLRP, 2022b).

Initially, only about $500,000 was appropriated to the VMLRP program; this has since grown to $9.5 million as of fiscal year 2022 (FY22). The VMLRP is the only program that has mapped out where shortage areas exist, which has been key to understanding the extent of the problem and the need for more food animal veterinarians. The VMLRP also distinguishes between a need for private and public practice needs, and whether the need is in a rural or non-rural area. As can be seen in Figure 3, the largest need is in private, rural food animal practices. The second-largest need is in public practice.

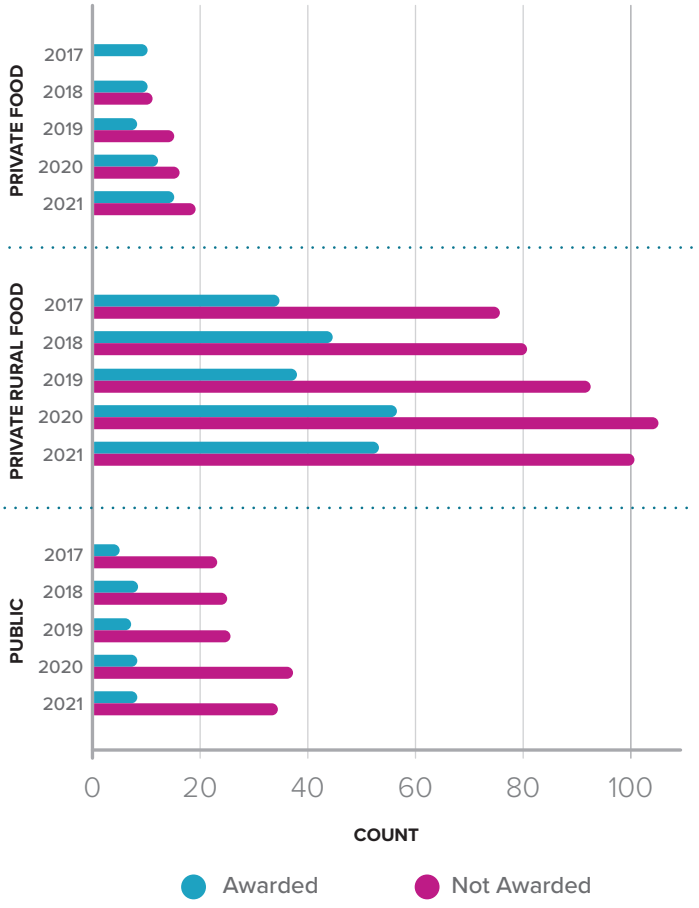
There were fewer eligible applicants in 2020 than nominated areas. Only 76 applicants received awards. Understanding the trends that have led to this current situation is vital to targeting future policy changes to address this growing issue.

The majority of designated shortage areas fall under the Type II Rural Private Practice Food Animal Medicine category. Unfortunately, over two-thirds (268 of 750 veterinary shortage areas) of the designated positions are not awarded each year, predominately due to limited funding for the program (USDA-VMLRP, 2022b). In addition, there were fewer eligible applicants in 2020 (136) than nominated areas (217). Only 76 applicants received awards. Understanding the trends that have led to this current situation is vital to targeting future policy changes to address this growing issue.

In addition to funds dedicated to the VMLRP, the USDA FSIS has been allocated an additional $2.8 million in USDA's FY22 appropriations bill. This funding aims to "address the persistently high levels of public health veterinarian vacancies."

These programs have helped address food animal veterinarian shortfalls, but they have not been able to substantially alleviate the problem. As Figure 2 shows, about 67% of shortage vacancies identified under the VMLRP are not filled each year. Moreover, unfilled positions must undergo a reapplication process from State Animal Health Officials for shortage status and may not necessarily be included in the following year's count. Further, State Animal Health Officials are only allowed to nominate a set number of shortage

Figure 3. VMLRP-Designated Award Shortages by Practice Type



Source: USDA-VMLRP, 2021

areas, which is based on Livestock & Livestock Products Sales and Approximate Land Area. The maximum number of nomination areas is eight per state, which includes new and carry-over nominations from the previous year (USDA-VMLRP, 2020). This approach was adopted to reduce administrative burden and assist in identification of "highest need" situations (USDA-VMLRP, 2022). Yet, the VMLRP rules do not include a definition of what constitutes a geographic area for a shortage nomination and some shortage areas cover large portions of the state. For example, in 2021, Kentucky listed three shortage areas, encompassing 87 of the 120 counties in the state, as Type II rural food animal practice shortages.

Another issue is that a position could have applicants, but there is no guarantee that one of them will be selected. Nor are the chosen applicants guaranteed the full $25,000 amount of loan repayment support each year – this amount is only the maximum that they may receive per year. Additionally, with the average amount of education debt veterinary students accrue at about $188,000, even the maximum amount under the VMLRP would only cover about 40% of average debt, assuming no accrued interest. The VMLRP does allow for reapplication for awards by previous recipients, which increases the total possible amount that can be received, but a relatively small proportion of eligible applicants (about 13% in 2020) for the VMLRP are typically from renewal applications. Applicants may also have to apply for another nominated shortage area rather than stay at their current location to meet the eligibility requirements, which is less than ideal.

The VMLRP program also states that individuals who owe veterinary service commitments to state, federal, and other entities due to their participation in other programs are ineligible for VMLRP repayments until other service commitments are satisfied. This requirement presents another barrier to fulfilling the immediate need for food animal veterinarians. VMLRP awards are also subject to federal income tax. To offset this tax liability, the program allocates additional funds to recipients to pay federal income tax, which ultimately limits already-constrained program funding (USDA-VMLRP, 2022b). Additionally, these awards do not cover state income tax nor account for the fact that the applicant's outstanding loans are also accruing interest.

Another federal program called the Veterinary Services Grant Program (VSGP) focuses on training and making rural veterinary businesses economically sustainable. Also managed by USDA NIFA, the VSGP has a similar goal to the VMLRP, which is to alleviate shortage situations related to food animal and public veterinarian roles. The VSGP supports two program priorities: (1) education, extension, and training; and (2) rural practice enhancement. The goal of the education, extension, and training priority is to cover the expenses of training programs related to food safety and food animal medicine (USDA-VSGP, 2022). This could include attending continuing education or establishing and/or expanding residency, fellowship, internship, and externship programs. For rural practice enhancement, the VSGP supports equipping veterinary practices (including mobile practices) by subsidizing overhead costs, as long as those facilities are in designated shortage areas. The VSGP has received $3.5 million in funding for FY22.

While the VSGP addresses the need for expanded training opportunities (CAST, 2020), the program takes a post-hoc approach to the decline of veterinary students interested in food animal medicine. In other words, this program does not support future food animal veterinarians directly. Rather, it supports the indirect input of establishing more educational opportunities. Arguably, the more immediate need is to attract more food animal veterinarians in post-secondary education. Further, rural practice enhancement grants are only available to those providing veterinary services in current shortage areas. As previously mentioned, shortage areas may be nominated one year, but not get awarded, and then fail to be re-nominated by State Animal Health Officials for the following year. So, there is no consistent way to know if an applicant at one location is eligible for an award. Consistency in award eligibility is needed for a successful program.

Similar types of federal policies and programs exist for human health physicians, and these are worth mentioning and analyzing how they compare. The National Health Service Corps provides a tax-exempt Loan Repayment Program to physicians who provide medical services at sites that are predominately focused on patients under Medicaid, Medicare, and Children's Health Insurance Programs (HRSA, 2022). There is also a Rural Community Loan Repayment Program that coordinates with the Rural Communities Opioid Response Program. The requirements are similar to those for the general Loan Repayment Program, except the focus is on rural facilities that also have substance abuse disorder treatment facilities.

Much like the VMLRP, the goals of these programs are to place physicians in areas that are underserved, and they focus on alleviating the burden of education debt. Similarly, they limit the amount that can be earned to $50,000 for full-time work or $25,000 for half-time work at designated facilities with a two-year commitment (HRSA, 2022). The Rural Loan Repayment Programs may grant up to $100,000 with a three-year commitment. The maximum amounts are not guaranteed and are likely less than half of the new physicians' education debt burden before accrued interest. Other programs provide tax-free loan forgiveness for human health physicians and could be considered as a possible alternative for current programs aimed at alleviating food animal veterinarian shortages.

State Policy Initiatives

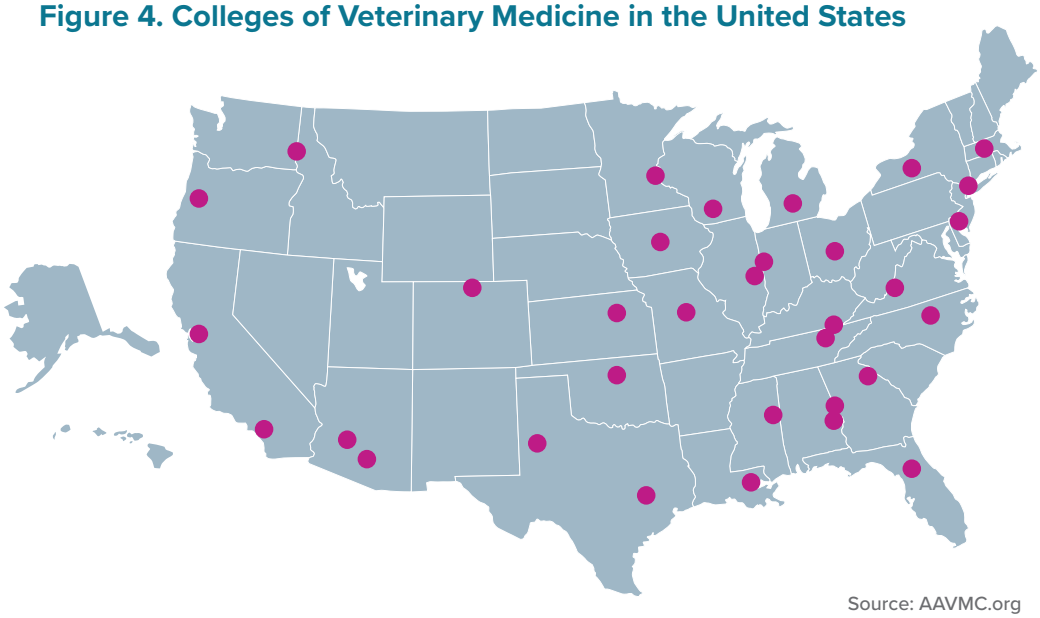
In addition to federal initiatives to address the shortfall of food animal veterinarians, some states have introduced similar policies funded by state tax dollars. As an example, the Minnesota and Vermont State Departments of Agriculture have implemented loan repayment programs that are similar in structure to the VMLRP. In both states' programs, the only restrictions are that recipients must work in rural areas and a majority of the work must be with food animals. Unlike the VMLRP, work locations do not have to be within shortage areas. Funding amounts vary greatly depending on the state and program.

Other state programs focus on funding veterinary students who attend out-of-state programs by paying the out-of-state portion of their tuition. A new bill proposed in Arizona would provide up to $100,000 in loan repayment to recruit veterinarian students to Arizona. However, this program is not specific to rural or food animal veterinary practice. In 2022, the Oklahoma Board of Veterinary Medical Examiners started a scholarship for students intending to pursue large animal or public veterinary service in shortage areas. One stipulation is that the student is required to sign a legally binding contract/letter of intent of their career intentions. This program is different from many other programs and addresses the long-term issue of food animal veterinarian shortages within the state. Many other states have no such programs or have attempted to fund similar loan repayment programs with little to no success.

Institutions of Higher Education Initiatives

For many years, there were only 28 veterinary programs in the United States. Given the rise in student interest in companion animal practice and the simultaneous decline in food animal and rural practice interest, many of these programs began to adapt their training programs to meet these changes in demand. While there have been encouraging changes in the higher education sector to address shortages, more is needed to meet the scale and urgency of the issue.

Figure 4. Colleges of Veterinary Medicine in the United States



Source: AAVMC.org

Several new programs have been initiated throughout the country, but only a small portion are focusing their curriculum specifically on rural and food animal perspectives. For example, one focus of the mission of Tennessee's Lincoln Memorial College of Veterinary Medicine is to serve animals and their human owners in the Appalachian region, which is predominantly rural. Similarly, Texas Tech University's School of Veterinary Medicine is focused on providing veterinary education to students who will go on to serve the rural and regional communities and the animal industries important to the region. Moreover, the school's admission process emphasizes identifying students from underserved regions. Over the last 10 years, a total of five new training programs have been initiated – bringing the national total to 33 – with more programs in the planning and start-up phase (Figure 4).

Some established educational programs are also striving to better support rural and food animal needs by enhancing curriculum and using targeted recruitment programs. One example is Cornell University's Center for Veterinary Business and Entrepreneurship, which is developing and integrating core business education into every student's training. This is especially relevant as a recent economic report found that one significant barrier to future food animal veterinary practices is the lack of business training (AVMA, 2017). As Figure 5 shows, educational gaps and needs identified by working veterinarians in a recent survey are finance, human resource management, managerial business analysis, and accounting.

Figure 5. Business Management Skills That a Survey of Bovine Practitioners Indicated Could Have Been Better Communicated to Them During Their Veterinary Training

Source: AVMA, 2017

Another example is the Kansas State College of Veterinary Medicine's two new programs focused on recruitment. The first is the Summer Program for Aspiring Rural Kansas veterinarians, which creates direct and purposeful connections between aspiring veterinarians and veterinary practices in rural communities throughout Kansas (K-State News, 2021). The second program is the Specialized Programs for the Recruitment of Indigenous, Native, and Tribal Students initiative, which provides opportunities for high school and college students who identify as tribal, Native American, or Indigenous to gain exposure to veterinary medicine as a potential career path. Considering most veterinarians choose to pursue the career before they enter college, focusing on the recruitment of high school students is key to increasing future interest in the area of rural and food animal veterinary medicine. Possible outlets for such efforts could be FFA, 4-H, or Ag in the Classroom programs.

POLICY OPPORTUNITIES

While current programs like the VMLRP have had some success, there is a clear need for further action to narrow the persistent and growing shortage of food animal veterinarians, especially in rural areas. From a recent survey of members of the animal agriculture committee of the National Association of State Departments of Agriculture (NASDA), several key opportunities were identified to address this shortfall.

Initially, an expansion of the VMLRP is needed. The size of individual award amounts has not kept pace with the growing debt levels. As pointed out earlier, the maximum payout of $75,000 over a three-year period does not cover even 50% of the mean education debt accumulated among veterinary graduates. While applicants can reapply for another three-year period, the low percentage of renewal applicants suggests that there are barriers to re-application. Further, about 30% of the funds appropriated every year under the VMLRP program are allocated to help recipients pay federal taxes on the repayment amount, decreasing the overall amount available to fund awards. Moreover, current funding for the VMLRP is not sufficient, given the number of nominated shortage areas throughout the country. One suggestion worth considering is tax-free loan forgiveness for those that serve in public food animal veterinary roles for a number of years, which would also incentivize veterinarians to pursue training and educational opportunities for such career paths.

Practice ownership has been shown to be one of the quickest ways for veterinarians to pay off education debt (Glaesemann, 2018). Therefore, another opportunity is to **assist in the establishment of rural and food animal veterinary practices.** In particular, there is a need to further support capital acquisitions that reduce the cost of starting and/or expanding veterinary businesses. The VSGP program does provide funding opportunities for such purchases, but the funds are split between supporting food animal training opportunities (education, extension, and teaching awards) and business cost subsidization (rural practice enhancement awards). First, significant expansion of funds is needed to support more veterinary business operations. This could be done within the current program or through creation of a carve-out within an existing USDA pro-

gram, such as the Rural Business Development Grant program, that would broaden the number of applicants for the program. Similarly, offering low-interest business loans like those offered through the USDA Rural Development Agency could make owning a rural and/or food animal veterinary practice more attainable, given the growing amount of education debt acquired by veterinary graduates. Reducing the stringency of business loan stipulations regarding education debt amounts would also benefit younger veterinarians.

The current method of defining a shortage area via a nomination and application process by State Animal Health Officials is also insufficient. This is a backwards-looking measure at rural food animal veterinarian shortages. A more forward-looking measure would **help proactively identify future shortage areas and serve to improve forecasting of need.** This is likely to reveal a higher number of shortage areas, as the current method likely undercounts the true need for food animal veterinarians. The current definition of a nominated shortage area can be a single county or many counties. While a specific geographic definition of a shortage area is likely infeasible, a consistent definition based on proactively identified needs – such as food animal populations and level of access to currently active veterinarians – would provide a more accurate picture of the problem nationwide and identify the most critical shortage areas.

Partnerships between the federal government, state governments, and allied associations are also a potential way to increase funding for specific programs – particularly the VMLRP. Some suggestions from NASDA survey respondents include engaging with livestock producer organizations to bolster funding opportunities. A similar suggestion is that state-funded loan repayment programs could be combined with the federal VMLRP to be cooperative rather than risk them competing or becoming redundant. Combining programs could also be a way to increase loan forgiveness amounts above the $75,000 maximum that is currently offered by the VMLRP. In addition, changing the restriction that individuals can qualify for VMLRP before completing commitments to state, federal, and other entities but only receive compensation from VMLRP during time of service, will help alleviate the short-term shortage issue.

Lastly, there is an opportunity for public policy to assist in stemming the decline in educational pipelines for rural food animal veterinarians. Many veterinary students choose to pursue veterinary medicine well before entering college. Funding programs to increase awareness of food animal veterinary careers in rural elementary and secondary schools would increase interest and future veterinary school applications from these student populations (Beck Dallaghan et al., 2021). Such programs could be implemented through the National FFA and 4-H organizations, along with other allied partners. Further, since the number of students currently graduating from veterinary programs and pursuing food animal practice has remained relatively flat, federal/state funding supporting additional seats in existing programs for students interested in food animal medicine would bolster future numbers. This is especially pertinent given the decline in federal and state funding for existing veterinary programs. Additional funding for training opportunities at existing veterinary programs would also increase the capacity of the programs to do more education around food animal career paths. Other options would be to provide scholarships and fellowships for those pursuing food animal medicine to offset the cost of education. This would be an opportunity for public-private partnerships, such as those being pursued by the distributed clinical training model at Texas Tech University School of Veterinary Medicine. Another option could be cross-training between all types of veterinarians to become licensed for processing facility inspections. One such program exists in the province of Alberta in Canada (Appointed Inspector Program, 2022).

CONCLUSIONS

The current shortfall in food animal veterinarians is concerning and has significant implications for a continued safe food supply chain, small/medium-sized independent animal farms, and rural communities. The problem has been growing for the past two decades, and the current set of policy interventions has only had limited success. This is evident in the increasing number of shortage areas, and that roughly one-third of veterinary positions in these areas are left unfilled each year. This is true for both positions in private food animal medicine and public practice. Without addressing the veterinary shortage issue, the consequences are serious and could result in a less safe food supply chain, increased risks of animal disease and threats to public health, and an overall decline in the economic prosperity of rural communities and small/medium-sized agricultural operations.

To address this challenge, policymakers should prioritize the following actions, which fall under three categories:

1. **Strengthen existing debt repayment programs that address veterinary shortages in rural communities. Tactics for increasing the impact of these programs should include:**

    - **Expanding funding for the VMLRP.** Currently, the program's impact is limited because it is unable to fill positions in all of its designated shortage areas, and awards to veterinarians are comparatively small, only alleviating a fraction of an individual's debt on average. Increasing funding for the program would enable more veterinarians to participate, helping bolster livestock sectors and economies in more rural communities, and keep pace with the current trend of rising educational debt. The scope of the VMLRP should also be expanded to increase resources around educating and retaining food animal veterinarians, which would help address shortage issues over the long term.
    - **Overhauling the application criteria for the VMLRP to enable more veterinarians to participate.** In particular, the program should allow individuals to qualify for VMLRP funds before and during completing commitments to state, federal, and other entities. This would help increase the number of applicants and accelerate the impact of the program in the short term.
    - **Providing loan repayment awards to veterinarians who agree to work in the public sector and rural areas on a tax-free basis.** Because salaries in public food animal practices are limited by strict civil service requirements, there are few incentives to pursue such a career path. Even assistance in the form of loan repayment may not be enough to ease the education debt burden. Tax-free loan forgiveness after a number of years of service would be a better incentive and aligns with similar federal debt relief programs for human health medical school graduates like the Public Health Services Act. In addition, for the VMLRP, providing awards to private-sector rural veterinarians under a tax-free designation would add approximately 37% more funding direct to awardee debt repayment and not simply return a portion of the VMLRP funding to the Treasury.
    - **Improving methods for consistent identification of veterinary shortage areas to better target rural communities in need.** The VMLRP's current nomination process is limited to a set number of shortage areas per state, based on livestock numbers and land area, which undercounts the overall need for food animal veterinarians. By expanding the definition of a shortage area and analyzing the factors that lead to a shortage, a more accurate measure of need can be established. Moreover, a more quantitative approach based on livestock operations/farms and access to veterinarians would provide nuance to the depth of need, so the most critical shortage areas can be proactively identified for the future. To address this issue, the next farm bill should require the Secretary to establish a task force should be established to define a consistent, quantitative approach that also allows for input from state animal health officials.

CONCLUSIONS (CON'T)

2. **Expand programs that offer business support** for veterinary practices that serve rural communities. Tactics for this should include:

   - **Expanding funding, increasing programmatic scope, and decreasing application barriers for the VSGP.** If the financial costs of starting, acquiring, or expanding a private practice in the food animal veterinary sector could be reduced were lower, then veterinarians could better balance their educational debt along with business debt. Currently, the VSGP is underutilized due to the limited scope of its grant program and the complexity of its application process, which is difficult to navigate. Increasing funding, creating a more streamlined application process, and expanding the scope of the program to create encourage mentoring with the a community of applicants and awardees would help address veterinary shortages both in the short and long term.
   - **Establishing low-interest business loans for food animal private practices.** Many young and early career veterinarians are unable to start businesses due to a lack of business loan options, which often disqualify individuals with high levels of education debt. Partnering with the USDA Rural Business Development Grant program and setting aside a portion of its funds for veterinary businesses could be a relatively easy policy fix, given the existing programs and structures. Less stringent rules regarding existing education debt when applying for government-backed business loans would increase the ability of younger veterinarians to qualify despite large education debt.

3. **Fund and establish programs to support a strong pipeline of veterinary students committed to working in rural areas and in the food animal sector. Tactics for this would include:**

   - **Supporting schools by enhancing training opportunities and actively recruiting students from rural backgrounds.** This would encourage more young people to specialize in food animal practices and help alleviate shortages over the long term.
   - **Targeting students in post-secondary education to increase retention.** One option may be to provide funding to create a cohort program that would support and train veterinary students within each state. These cohort programs could offer appropriate financial literacy, business and legal education, lifestyle support, and mental health awareness. These cohort programs could be combined with government-backed initiatives to encourage veterinary programs to actively recruit and target veterinary school applicants from rural and diverse backgrounds. This initiative would seek to replicate mirror successful medical school programs that recruit applicants from rural communities.

REFERENCES

Appointed Inspector Program. (2022). Accessible at: https://www.alberta.ca/appointed-inspector-program.aspx

American Veterinary Medical Association (AVMA). (2016). "2016 AVMA Report on Veterinary Markets."

AVMA. (2017). "AVMA 2017 Economic Report Series: American Association of Bovine Practitioners Economic Report 2016."

AVMA. (2021). "2021 AVMA Report on Economic State of the Veterinary Profession."

Beck Dallaghan G L, Spero J C, Byerley J S, et al. (2021). Efforts to Recruit Medical Students From Rural Counties: A Model to Evaluate Recruitment Efforts. Cureus 13(8): e17464. doi:10.7759/cureus.17464

Bureau of Labor Statistics. (2021). "Occupational Outlook Handbook, Veterinarians." Accessible at: https://www.bls.gov/ooh/Healthcare/Veterinarians.htm

Council for Agricultural Science and Technology (CAST). (2020). "Impact of Recruitment and Retention of Food Animal Veterinarians on the U.S. Food Supply." CAST Issue Paper, No. 67. Accessible at: https://www.cast-science.org/publication/impact-of-recruitment-and-retention-of-food-animal-veterinarians-on-the-u-s-food-supply/

Data Axle. (2021). Marketing data provided by Data Axle. 13155 Noel Road, Suite 1750, Dallas, TX 75240. Accessed at: https://www.data-axle.com/

Einav, L., A. Finkelstein, and A. Gupta. (2017). "Is American pet health care (also) uniquely inefficient?." American Economic Review, 107(5), 491-95.

Fatherly. (2017). "The 2017 Imagination Report: What Kids Want to Be When They Grow Up." Accessible at: https://www.fatherly.com/love-money/the-2017-imagination-report-what-kids-want-to-be-when-they-grow-up/

Glaesemann, J.M. (2018). Veterinary practice ownership, student loan debt, and job fulfillment. In American Association of Bovine Practitioners Proceedings of the Annual Conference (pp. 18-20).

Greenhill, L. (2015). "Market for Veterinary Education." Presented at the American Veterinary Medicine Association Economic Summit, Chicago, Illinois, October 21, 2015.

Health Resources and Services Administration (HRSA). (2022). "HRSA: National Health Services Corps, Loan Repayment." Accessible at: https://nhsc.hrsa.gov/loan-repayment

IBISWorld. (2021). "Veterinary Services in the U.S." Accessible at: https://www.ibisworld.com/united-states/market-research-reports/veterinary-services-industry/

IMPLAN® model. (2021). Data, using inputs provided by the user and IMPLAN Group LLC,

IMPLAN System (data and software), 16905 Northcross Dr., Suite 120, Huntersville, NC 28078. Accessed at: https://www.IMPLAN.com

K-State News. (2021). "New programs help Native, Indigenous, tribal and rural Kansas students develop interest in becoming veterinarians." Accessible at: https://www.k-state.edu/media/newsreleases/2021-02/native-rural-interest-admissions.html

Neill, C.L., R.B. Holcomb, and B.W. Brorsen (2017). "Starting on the Right Foot: School Characteristics and Veterinarian Starting Salary." Journal of Agricultural and Applied Economics, 49(1): 120-138.

Neill, C.L., R.B. Holcomb, B.W. Brorsen. (2018). "Current Market Conditions for Veterinary Services in the U.S." Applied Economics, 50(60): 6501-6511.

Neill, C.L., C. Hansen, and M. Salois. (2022). "The Economic Costs of Burnout in Veterinary Medicine." Frontiers in Veterinary Science, 9, Forthcoming.

St. Louis Federal Reserve Bank. (2019). "Looking at the Urban-Rural Divide in Economic Growth." Accessible at: https://www.stlouisfed.org/on-the-economy/2019/july/looking-urban-rural-divide-economic-growth

Tack, D.M., MJ. McCool-Eye, C.R. Kizer, D.A. Dargatz, and A.M. Turzillo. (2018). "Exploration of Veterinary Shortages in the Wake of the Veterinary Feed Directive." Journal of the American Veterinary Medicine Association, 253(10): 1334-1341.

USDA-Economic Research Service. (2020). "Rural Economy." Accessed at: https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/rural-economy/

USDA Food Safety Inspection Service (USDA-FSIS). (2022). "Public Health Veterinarian (PVH)." Accessed at: https://www.fsis.usda.gov/careers/job-opportunities/career-profiles/public-health-veterinarian-phv

USDA National Institute of Food and Agriculture (USDA-NIFA). (2022). "Fiscal Year 2021 Annual Report: Veterinary Medicine Loan Repayment Program." Accessible at: https://www.nifa.usda.gov/sites/default/files/2022-04/FY%202021%20VMLRP%20Annual%20Report.pdf

USDA Veterinary Medicine Loan Repayment Program (USDA-VMLRP) . (2020). "Maximum Allocation Nomination." Accessible at: https://www.nifa.usda.gov/sites/default/files/resource/FY%202020-22%20Maximum%20Nomination%20Allocation_0.pdf

USDA-VMLRP. (2021). "Veterinary Services Shortage Situations Map." Accessed at: https://www.nifa.usda.gov/vmlrp-map

USDA-VMLRP. (2022). "Allocation Rationale." Accessible at: https://www.nifa.usda.gov/sites/default/files/resource/Allocation-Rationale.pdf

USDA-VMLRP. (2022b). "Veterinary Medicine Loan Repayment Program." Accessible at: https://nifa.usda.gov/grants/programs/veterinary-medicine-loan-repayment-program

USDA Veterinary Services Grant Program (USDA-VSGP). (2022), "Veterinary Services Grant Program." Accessible at: https://nifa.usda.gov/grants/programs/veterinary-services-grant-program

Wang, T., Hennessy, D.A., Park, S.C. (2015). "Demand Side Change, Rurality, and Gender in the United States Veterinarian Market, 1990-2010." Agribusiness, 1-18.

Wynne, G., Artz, G. M., Schulz, L., Rademacher, C. (2017). "How Do Swine Producers and Veterinarians Expect the VFD to Affect Their Business?" Agricultural Policy Review, 3(3), 1-2.