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## Access to Scientific Literature in Rural Veterinary Practice

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### Introduction

The advent and use of new technologies is affecting rural veterinary practices in a number of ways, including increasing access to digital information in even the least urbanized areas of the country. Veterinary practitioners who can connect to the internet have access to much of the veterinary, medical, and agriculture literature published anywhere in the world.<sup>1</sup> This access to scientific literature in rural areas is equal to that available anywhere in the U.S. with the possible exception of within the walls of a library at one of the colleges of veterinary medicine.

### Discussion

The explosion of information availability due to the internet has created a problem of information volume and quality. If practitioners use a search engine such as Google, WebCrawler, or Yahoo! to access information about a veterinary question, the number of responses and information sources are likely to be unwieldy and many will lack peer review or scientific method. Therefore, in order to practice high-quality medicine, veterinary practitioners need efficient methods to search for information of clinical importance that has been rigorously reviewed for appropriate scientific method. Such methods will increase the quality and decrease the quantity of information returned from a query.

One of the first and most open entrants into the realm of searchable, online medical literature relevant to veterinary practitioners was the U.S. government through the National Institute of Health's databases. These databases were made available through Medline and the PubMed literature retrieval system. PubMed (<http://pubmed.gov>) was created by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine in 1996 and is an excellent free source of journal article citations and abstracts (and some full length articles).<sup>2, 3</sup> These databases include approximately 110 veterinary journals indexed in PubMed and a medical database of nearly 5,200 biomedical journals that cover human medicine, nursing, biomedical sciences, and other related fields. Many widely read veterinary publications (but not all) are represented in the database. PubMed currently indexes over 18 million articles. The database is updated daily to provide current published literature from around the world with over 80% of the articles being published in English. The peer-reviewed article citations and abstracts are provided to PubMed by the participating publishers at any time after acceptance for

publication – with some publishers delaying access to protect the financial value of the articles for their subscribers.<sup>4</sup> Over 7,000 journals provide links to the full length articles, some of which are free, while others require payment to view the articles directly from the web. In addition, the LoansomeDoc feature of PubMed allows users to request articles from libraries for a fee; and many libraries associated with colleges of veterinary medicine will access identified articles at some level of cost recovery.<sup>5</sup>

The Veterinary Medical Library Section of the Medical Library Association has adapted a PubMed brochure (created by the National Library of Medicine) that is focused on veterinary medicine.<sup>6</sup> In addition, PubMed provides online tutorials and ‘help’ links to help practitioners gain familiarity and expertise to search the database in order to find articles that address specific clinical questions that arise in daily practice.

One of the most valuable ways to utilize PubMed is through ‘MyNCBI’. This feature helps veterinarians to set up searches and to have articles on identified topics of interest delivered or ‘pushed’ to them electronically at a predetermined time such as once a week or once a month (Figure 1). This provides a simple method to be assured that veterinarians can keep up with the latest information on areas of veterinary medicine that is key to a particular practice or special interest. For example, the practitioner can have citations (and abstracts when available) of all articles that have been published in the past month on the topics of bovine respiratory disease, bovine viral diarrhea, and bovine reproduction pushed to their email inbox the first Saturday of each month. Most months, one to five articles on each subject will be delivered and these can then be read or archived for later use. Because of this feature of PubMed, a practitioner’s need to remain current with peer-reviewed literature on the subjects most pressing to his or her daily practice can be managed in a practical and time-efficient manner (this method for setting up automatic updates is described in [Figure 1](#)).

Figure 1. Creating a Search in PubMed and Setting up Automatic Updates

1. Go to <http://www.ncbi.nlm.nih.gov/pubmed/>
2. Click on “My NCBI” (upper right corner)
3. Click on “Register for an account”
4. Follow the prompts to create a username and password.
5. Complete the bottom half of the form and finally click “Register”.
6. Now that you are registered and logged in you can now not only search for specific topics but can save those searches and have new material emailed to you once it is in print.
7. Go back to PubMed
8. Type your desired search into the space provided
9. Click “Search”.
10. If you are happy with the results click “Save Search”.
11. At this time a screen will appear and will ask you if you want updates of new literature that pertains to your subject of interest. Click yes or no.
  - a. Then indicate how you would like to receive the new literature (frequency/day of the week, etc.)
12. You can repeat this process using any type of subject you would like.
13. To retrieve your search results on a specific subject that was saved click on “My NCBI”.
14. This will bring you to another screen that will allow you to access any given saved search.
15. By clicking on the desired search, this will bring up the current list of search results.

Another resource provided free of charge by the U.S. government is Agricola - the National Agricultural Library. AGRICOLA provides citations to veterinary and animal science literature as a service of USDA. One limitation of AGRICOLA is that many citations are not readily available. The URL is <http://agricola.nal.usda.gov/> and the database includes journal articles, book chapters, and short reports. Other free online resources that are valuable to some veterinarians who deal with regulatory and public health issues include: Emerging Infectious Diseases <http://www.cdc.gov/ncidod/eid/index.htm>, FDA Veterinarian Newsletter <http://www.fda.gov/cvm/index/fdavet/1999/1999toc.html>, and the MMWR: Morbidity and Mortality Weekly Report <http://www.cdc.gov/mmwr/>.

PubMed and Agricola are not the only searchable databases of journals useful to veterinary practitioners. Many of the other services are on a fee-for-service basis and can be very valuable. CABI is a subscription-based database that includes all of the veterinary journals indexed in PubMed as well as several other journals, conference proceedings, and university/extension publications more specific to agriculture, animal nutrition, and veterinary medicine.<sup>7</sup> The CABI veterinary science database alone contains more than 650,000 abstracts and citations with 15,000 records added annually. Similar to PubMed, CABI can be used to store search histories and to ‘push’ new articles on areas of interest at weekly or monthly intervals via email to registered users.<sup>8</sup>

Google Scholar (<http://scholar.google.com/>) differs from Google and other search engines in that it limits its search to scholarly literature from peer-reviewed journals. It is simple to use and provides a familiar interface for current users of Google. It may identify many, but not all of the articles identified by PubMed or CABI.

Many of the articles identified in a search on PubMed or CABI (or other literature searches) are not currently provided free of charge, but by reading the abstract, one can determine if they are likely to be valuable enough to utilize the widely available pay-as-you-go option (using a credit card) to access individual articles. While not free, this method allows practitioners to pay for only the articles they need per year rather than an annual subscription.

If a practitioner desires an electronic version of many of the articles appearing in a particular journal, he or she may choose to subscribe to that journal. Some publishers offer a “free” online version along with the hard copy version of a journal, others provide an online version in addition to the print version for an additional fee; and some offer the online version in lieu of the print version (often for a substantially lower subscription fee).<sup>9, 10</sup>

Other ways that veterinarians practicing in rural areas can access publications and meeting proceedings is through membership in professional associations such as AVMA and species or specialty associations such as American Association of Bovine Practitioners ([www.aabp.org](http://www.aabp.org)), the Academy of Veterinary Consultants ([www.avc.org](http://www.avc.org)), the American Association of Swine Veterinarians ([www.aasv.org](http://www.aasv.org)), American Association of Small Ruminant Practitioners ([www.aasrp.org](http://www.aasrp.org)), the Society for Theriogenology ([www.sft.org](http://www.sft.org)), and the American Association of Equine Practitioners ([www.aaep.org](http://www.aaep.org)), to list a few. These associations make electronic access to their publications available to their members at no charge or at a reduced subscription price.<sup>11</sup> Also, these organizations manage e-mail discussion lists that are limited to members in good standing. These discussion lists allow members to post questions and ask for help on an on-going, unlimited basis. Thus, information and advice are at the fingertips of the rural practitioner.

## Summary

Increased information availability and widespread access to published articles at low or no cost is changing the sources of information that are available to and used by veterinary practitioners in rural settings. As recently as ten years ago, veterinary practitioners were not utilizing the internet as a major source of information to provide up-to-date clinical care.<sup>12</sup> However, the increased access to current peer-reviewed articles available on the internet; and the enhanced ability to search for pertinent articles in an efficient manner with search engines such as PubMed and CAB now allow practicing veterinarians to have access to a breadth of veterinary literature only possible within the walls of veterinary medical library a few years ago. And, with the speed of change within library science and online information availability, rural veterinary practitioners should be prepared for continued enhancements in their abilities to access current and valuable information.

**End Notes:** Larson, Bob L. "Access to Scientific Literature in Rural Veterinary Practice." [\*Online Journal of Rural Research & Policy\*](#) (5.7, 2010).

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## Author Information

### Bob L. Larson ([back to top](#))

Dr. Larson was raised in northeast Kansas and attended Kansas State University where he received a bachelor degree in Animal Science. He stayed at Kansas State for his veterinary education and he received his DVM in 1987. After one year in mixed practice in Southeast Kansas, he returned to Kansas State to pursue a PhD in the Department of Animal Sciences and Industry. His graduate work focused on beef female reproduction and nutrition-reproduction interactions. He received his PhD in 1992 and returned to private practice for one year in Carthage, Illinois and three years in Abilene, Kansas. While in private practice, Dr. Larson worked primarily with cow-calf producers, backgrounding/stocker operations, and farmer-feeders.



In 1996, Dr. Larson joined the faculty at the University of Missouri as a veterinary beef production specialist where he worked on the Commercial Agriculture Program's Beef Focus Team, a multi-disciplinary team made up of veterinarians, agricultural economists, and animal scientists. In 2006 he returned to Kansas State University as the Coleman Chair of Food Animal Production Medicine.

Dr. Larson is board certified by the American College of Theriogenologists, the American College of Animal Nutrition, and the American College of Veterinary Preventive Medicine. He has served as the president of the Academy of Veterinary Consultants and the Evidence Based Veterinary Medicine Association, and he has served on committees for the American Association of Bovine Practitioners and the National Cattlemen's Beef Association. His primary areas of interest are improving reproductive efficiency in cow herds and the integration of marketing, nutrition, health, production efficiency, and quality assurance in stocker and feedlot operations.

Bob and his wife Laura (DVM '92) have three daughters, Mariah (12 years), Karrin (9 years), and Annie (5 year).