Sample submissions to a diagnostic laboratory

Sharon L. Clowser, *BS*
University of Nebraska-Lincoln, Veterinary Diagnostic Center, Lincoln, NE 68583-0907

Abstract

The quality and appropriateness of samples submitted to a veterinary diagnostic laboratory have a significant effect on the quality of the test results obtained. A veterinary technician can be of valuable assistance with veterinary diagnostic sample submission. Specimens that are properly collected and preserved are beneficial in helping to establish a diagnosis. Prior to collecting samples, it is important to know what type of sample is needed for the suspected diagnostic differentials, size or quantity of sample needed, type of storage container, shipping requirements, and any special handling recommendations. The technician may assist the veterinarian in collecting specimens, consult with animal owners on sample collection, contact the diagnostic laboratory if needed, complete submission forms, and pack and ship samples.

Key words: veterinary diagnostic laboratory, samples, veterinary technician

Résumé

La qualité et la pertinence des échantillons soumis à un laboratoire de diagnostic vétérinaire ont un effet significatif sur la qualité des résultats obtenus par les tests. Un technicien vétérinaire peut être d'une grande aide dans le processus de soumission des échantillons pour diagnostic vétérinaire. Les échantillons qui sont recueillis et préservés de façon appropriée aident grandement à établir un diagnostic. Avant de recueillir des échantillons, il est important de connaître quel type d'échantillon est requis pour le diagnostic différentiel soupçonné, la taille ou la quantité de matériel requise, le type de contenant d'entreposage, les besoins pour l'expédition et n'importe quelle recommandation pour une manutention spéciale. Le technicien peut assister le vétérinaire pendant la cueillette des échantillons et la consultation avec les propriétaires d'animaux lors de la cueillette et aussi aider à contacter le laboratoire diagnostic si nécessaire, à compléter les formulaires de soumission et à emballer et expédier les échantillons.

Diagnostic Laboratory Overview

A veterinary diagnostic laboratory provides diagnostic medical testing to assist veterinarians in identifying and controlling disease conditions affecting animals, animal industries, and public health. The Nebraska Veterinary Diagnostic Laboratory (NVDL) is an American Association of Laboratory Diagnosticians (AAVLD) accredited, full-service diagnostic laboratory. The primary emphasis of the laboratory is on food and companion animal diagnostic services, disease surveillance, and epizootic and enzootic disease investigations of concern to animal and human health. The Nebraska Veterinary Diagnostic Laboratory's mission is to assist veterinarians, their clients, livestock producers, and others responsible for animal and public health concerns in the detection, prevention, and understanding of disease. Faculty and staff will achieve these ideals by providing timely and accurate diagnostic services. The veterinary technician can assist with the timely and accurate diagnosis by providing accurate submission information and appropriately handled, packed, and shipped samples.

What is a diagnostic specimen? A diagnostic specimen is any animal or animal material, including excreta, secreta, blood and its components, tissue, and tissue fluids submitted for diagnostic or investigative purposes. This may also include any environmental sample or other pertinent material to a case such as plants, grains, feeds, water, or chemicals. In most cases veterinarians initiate the submission of samples to the veterinary diagnostic laboratory. The NVDL will accept submissions from animal owners; however, it is strongly recommended that submissions to the laboratory be made through and with the assistance of a veterinarian. A veterinary practitioner can evaluate animal health problems, determine suitable laboratory submissions, interpret laboratory results, and recommend and implement treatment strategies.

If a live animal is to be submitted for a necropsy, the diagnostic laboratory should be contacted prior to transporting the animal. The technician may be asked to contact the diagnostic laboratory to provide pertinent case information prior to submission. If the diagnostic laboratory is a facility that you have not used before or regularly, it is important to ask if the diagnostic laboratory performs euthanasia and provides carcass disposal services.

Sample Collection

Sample collection is dependent on the suspected disease and/or clinical history. Based on the veterinarian's differential diagnosis, all applicable specimens should be collected if possible and sent for diagnostic

testing. For example, in the case of bovine abortion, the entire fetus and placenta (including 3 cotyledons if possible) should be submitted. If the veterinarian performs the fetal necropsy on site, both fresh and fixed tissues (brain, heart, lung, liver, kidney, spleen, and thymus) should be submitted in addition to fixed and fresh placenta. Large animal practices may have a full-time, registered veterinary technician who rides along on calls with the veterinarian daily. In this case, the veterinary technician may be included in sample collection. Therefore, it is important for the technician to know how to appropriately handle and transport the collected samples.

The veterinary technician should be familiar with what type of sample is appropriate for the proposed testing. One of NVDL's most common tests for bovine herd health is bovine viral diarrhea (BVD). NVDL's BVD testing methods include IHC, ELISA or PCR. Possible specimens for BVD testing include serum or a skin sample. The different types of samples have different handling and shipping requirements, depending on the test method selected. The BVD antigen-capture ELISA requires a serum sample, and the BVD PCR requires either a serum sample or fresh skin sample. The serum sample or fresh skin sample should be placed in a blood serum tube (red-top tube). BVD IHC testing requires a skin biopsy from any location on the body. The most convenient method is to collect an ear notch sample. A triangle-shaped notch ranging between ¼ and ½ inch on a side is an adequate size. Biopsies should be placed in individual (preferably red-topped) tubes with neutral-buffered formalin. Skin samples should not be held in formalin for more than 1 week prior to submission to the diagnostic laboratory, as extended storage in formalin may result in a false-negative result.

Specimen Handling and Shipping

Proper handling, packing, and shipping of samples are critical for the integrity and accuracy of testing. A veterinary technician will most likely be responsible for handling samples, including packing and shipping of samples to the diagnostic laboratory. Each type of sample may have different storage, handling, and shipping guidelines. The technician must know the various sample handling requirements and shipping guidelines. Additionally, the technician must determine the best method of shipment and delivery time to the laboratory.

When submitting specimens, we recommend that each container is clearly and legibly marked with both the owner's name and veterinarian's name. The laboratory handles dozens of cases daily, and often the same name may appear the same day but from different locations. We recommend that samples have a secondary barrier, and that fresh and fixed tissues are separated. Many times we receive samples where the formalin has leaked onto the fresh tissue.

An important component of submitting diagnostic samples is the submission form. Information supplied to the diagnostic laboratory through submission forms is crucial to assist with an accurate and timely diagnosis. When completing the submission form, provide the laboratory with as much information as possible. No detail is insignificant. Some information to include would be owner and veterinarian's name and address; phone and fax numbers; species, breed, sex, age, and weight of affected animals; number of animals in herd or flock; morbidity and mortality; complete description of clinical signs; time the animal was last observed prior to death and condition at that time; detailed description of necropsy findings if applicable; and treatment history and detailed description of management practices, including vaccinations.

Conclusion

The veterinary technician plays a vital role in diagnostic laboratory submission. Most likely, the technician will be the last person to handle the diagnostic samples prior to submission. Ultimately the technician may be responsible for ensuring proper sample collection, handling, packing, shipping, and completed submission forms.