Veterinary laboratory testing: a viable alternative?

By Gary Burkhartsmeier

On the surface, the veterinary clinical-laboratory industry looks very much like that of its human counterpart. Two giant national corporations with regional laboratories strategically located across the United States control the lion’s share of the market. Yet, smaller regional laboratories and a host of local laboratory providers still successfully compete for their smaller share of business.

Twenty-eight veterinary colleges in 26 states drive prolific research programs and act as referral sources for a host of critical-need and esoteric-laboratory testing. Together, they provide an incredibly wide range of laboratory services to nearly 19,000 veterinary hospitals and clinics in every corner of the United States. Modern laboratory instrumentation and technologies used in human medicine are nearly all utilized in the veterinary-laboratory marketplace. For all of the similarities between human and veterinary clinical laboratories, however, the challenges posed by the veterinary laboratory market can be daunting.

Although no licensure or certification are required to operate a veterinary clinical laboratory, there is a voluntary program for accreditation through the American Association of Veterinary Laboratory Diagnosticians that may be a prestigious and valuable feather in the cap of a new veterinary laboratory. While regulatory issues may seem minimal because of the lack of direct regulation, federal and state restrictions may pose a credible threat to the success of a new veterinary laboratory.

For example, equine infectious anemia (EIA) — that has been incredibly well-controlled in the United States as a result of aggressive testing and disease-eradication programs — is a highly contagious, often lethal, infection of a horse. A current, simple agar-gel immunodiffusion test, historically known as the Coggins Test, is required by virtually all states for horses crossing state boundaries. EIA is one example of 10 livestock diseases for which the United States Department of Agriculture must give approval to a veterinary lab to perform one of 13 tests. A new laboratory cannot even purchase reagents for these tests without having that USDA certification.

The National Veterinary Services Laboratory in Ames, IA, provides the training to certify a laboratory to perform this test, but current policies restrict this training to laboratories recommended by the state veterinarian for the state in which the new laboratory is located. Despite the facts that a) nearly 1 million very mobile horses of the 9 million horses in the United States are stabled in California and, b) of the 490 laboratories in the United States approved by the USDA to perform EIA testing, only three commercial veterinary laboratories are currently approved in California, new laboratories are unable to secure that certification because the Office of the California State Veterinarian has deemed that there are “already sufficient testing resources” for EIA testing in California. This presents a political dilemma that has no solution; and without this very important testing capability to the show horse population in the state, a new laboratory’s chances for success are drastically limited.

Challenges for the veterinary lab

Expected service levels in the veterinary-laboratory market can also be far more challenging than those of the human-laboratory industry. Veterinarians are rarely asked to perform routine clinical-laboratory procedures for annual physical examinations. When a veterinarian refers a specimen to the laboratory, it is often a critical, life-or-death situation for which the laboratory data being ordered is vital to the well being of the subject. Results are needed quickly — often far more quickly than those of the human laboratory. Therefore, many veterinarians have multiple laboratory-specimen pickups each day, and results are often expected that same day. This can be a major challenge for a larger laboratory with an extensive geographical reach.

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Assay-validation and reference-range-establishment procedures can be a challenging task in the human laboratory, especially when age- and sex-specific variation is substantial. In a veterinary laboratory, however, those tasks are compounded by the fact that the laboratory will be serving a clientele that may refer specimens of up to seven of the most common companion and food-industry-relevant species. Just securing samples from “normal” adult subjects of the potential patient species for each of the procedures in the laboratory presents a task many times more difficult than that in the human clinical laboratory. The laboratory information system (LIS) must also be capable of presenting reports bearing the proper reference range for each species, something most LIS systems are ill-prepared to do.
Instrumentation in the vet’s laboratory

Many modern automated instruments utilized in today’s clinical laboratories are readily employable in the veterinary laboratory. Great care must be taken on the selection of some instrumentation for a veterinary laboratory, however. For instance, a hematology analyzer must have variable threshold capabilities for cellular sizing due to the significant differences in the size of erythrocytes from one mammalian species to the next — to say nothing about the complications of automated cell counting of nucleated red-blood-cells (RBCs) in avian species. The instrument must also be able to change those thresholds based on the species of the sample being analyzed.

In bacteriology, antibiotics unique to animal use are not often included in panels used on automated instrumentation, requiring the inclusion of manual procedures to develop important data on antimicrobial susceptibility and resistance of a particular isolate. Reporting of antibiotics for veterinary use must also recognize that certain antimicrobials may be lethal for some animal species. Laboratory protocols must be cognizant of such discrepancies, and reports must ensure the reporting of such potential species-specific hazards.

Quality and other veterinary-related testing obstacles

Although there are numerous texts on veterinary diagnostic medical microbiology, few, if any, effectively deal with the all-important specimen-collection procedures for various animal species, a critical need given the inter-species variation. Human diagnostic-microbiology textbooks devote a great deal of content to specimen collection and sample handling.

Veterinary medicine is on the very cutting edge of new molecular-diagnostic techniques. The use of real-time polymerase chain reaction to detect species-specific pathogenic organisms is setting the pace for modern medicine in fighting many human diseases, including the detection and prevention of the anticipated avian-influenza epidemic.

Because veterinary subjects are often very small, specimen size and specimen quality can pose big problems for the veterinary laboratory. Short sample handling is nearly routine, and the prospects of having unacceptable blood-to-anticoagulant ratios posing a problem, especially in coagulation testing, is something that the veterinary laboratory must be constantly on guard to detect. Fibrin clots in serum specimens, hemolysis, and frank lipemia are far more frequent potential interferences in veterinary specimens than may be typically seen in the typical clinical laboratory.

The challenges for a clinical laboratory contemplating offering veterinary testing are substantial, but the benefits — among them, not having to deal with constantly declining third-party reimbursements in the face of constantly rising operating costs — may still seem very attractive to today’s laboratorian. —

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