New Test Panels Now Available!

By: Roger Maes, DVM, PhD; Annabel Wise, DVM, PhD; Steve Bolin, DVM, PhD

The number of tests offered by DCPAH has grown considerably in the last few years. It is our intent to continue to expand our diagnostic capabilities by creating more new tests and improving existing tests. However, offering a large number of tests can make it difficult for our clients to quickly find the tests desired for the diagnostic challenge in front of them. To alleviate this problem, and to lower the cost of testing for our clients, we have started a process of bundling commonly requested tests for disease syndromes into easy-to-order panels that are less expensive than ordering each test separately.

Featured in this newsletter are diagnostic test panels for respiratory disease in horses, dogs, and cats. The diagnostic test panels shown here represent the most commonly requested tests and the most commonly requested combinations of tests. Although not listed in the panel of tests for respiratory disease in dogs, we also have PCR assays for canine influenza virus and canine respiratory coronavirus.

Some of our clients who provide veterinary service to equine owners have requested that we create diagnostic panels for equine neurologic disease and tick-borne disease. Consequently, we created those panels and included the tests most commonly requested. Please contact us if you have questions or comments concerning the test panels.
Anticoagulant compounds include naturally occurring dicoumarol and synthetic derivatives of 4-hydroxycoumarin and indandione. The synthetics are widely used in anticoagulant rodenticide formulations and as blood thinners in human medicine. Anticoagulant rodenticides are the second leading cause of animal pesticide poisoning, following organophosphates and carbamate cholinesterase inhibitors. Pets (particularly dogs) are most frequently affected. Exposure of animals to anticoagulant rodenticides can occur in several ways: 1) unintentional exposure to rodenticides used in or around homes; 2) malicious exposure to poisoned “baits”; 3) unintentional (“relay”) poisoning when predators and scavengers feed on carcasses of animals poisoned by primary ingestion of rodent baits; and 4) accidental poisoning of livestock by moldy sweet clover or Lespedeza, which can contain dicoumarol.

Anticoagulant compounds are classified in several ways. First, by molecular structure: (a) coumarin derivatives (dicoumarol, warfarin, brodifacoum, difethialone, bromadiolone) and (b) indandione derivatives (diphacinone, chlorphacinone, pindone, valone). Second, by generation: The first generation included warfarin, diphacinone, and chlorphacinone, which were not very potent (particularly warfarin) and required multiple feeding on baits to cause death. Subsequently, second-generation compounds—“super warfarins”—were discovered, including brodifacoum, difethialone, and bromadiolone, which were more potent and required only a single feeding to result in death. Third, by duration of effects: (a) short-acting (warfarin, coumafuryl, pindone, valone) and (b) long-acting (brodifacoum and bromadiolone among the coumarin derivatives and diphacinone and chlorphacinone among the indandione derivatives). The elimination half-life of warfarin is 14 hours in dogs (short-acting), and it is 4-5 days for diphacinone and 6 days for brodifacoum (long-acting). With therapy, animals poisoned with short-acting compounds recover within 7 days, while therapy for long-acting compounds is protracted (2-4 weeks, depending on the compound and amount ingested). Regardless of classification, all anticoagulant rodenticides have a unified mechanism of action. They all interfere with the recycling of vitamin K1, which is required to synthesize functional clotting factors (i.e., factors II, VII, IX, and X) needed for normal coagulation. In general, animals poisoned by anticoagulant rodenticides have reduced tolerance to these compounds and can be poisoned by much smaller doses upon re-exposure. Vitamin K1 is the antidote.

DCPAH has reconfigured its anticoagulant test panels to improve sensitivity and to shorten turnaround time to 3 days. As of August 2009, the routine/regular panel for both blood (70066) and tissue/bait (70015) will test for brodifacoum, bromadiolone, chlorphacinone, coumachlor, coumafuryl, coumatetalryl, difenacoum, difethialone, diphacinone, and warfarin. Pindone and valone will be offered only by special request on blood and tissue/bait for an additional fee of $24 for both compounds. Dicoumarol, which is present naturally in moldy sweet clover hay, will continue to be offered separately on blood (70009) and tissues (70109). Contact the Toxicology laboratory for further information at 517-355-0281.

Melamine Test Available!

In 2007, thousands of pets suffered acute renal failure following consumption of pet food contaminated with triazine industrial compounds, including melamine, cyanuric acid, ammelide, and ammeline. These industrial compounds were intentionally and illegally added to pet food by Chinese food manufacturers to artificially boost protein content. Renal failure was due to a result of melamine-cyanurate crystals precipitating within the kidneys of pets that resulted in physical blockage and necrosis of nephrons and tubular ducts. Besides cats and dogs, pigs (and presumably other animals) and fish are also susceptible to food contaminated by these triazine compounds. In 2007, DCPAH developed analytical tests for analyzing contaminated food, kidney and urine samples from affected animals. Because of continued requests, we have created a permanent test for food, kidney, and urine. The cost per specimen is $175 and includes all 4 compounds (melamine, cyanuric acid, ammelide, and ammeline). We require 1 kg (2.2 lb) of food, 10 g of kidney, or 5 mL of urine for this test. The turnaround time is 7-10 days. The catalog test number is 70068. This test is recommended as a permanent test for food, kidney, and urine. The cost per specimen is $175 and includes all 4 compounds (melamine, cyanuric acid, ammelide, and ammeline). We require 1 kg (2.2 lb) of food, 10 g of kidney, or 5 mL of urine for this test. The turnaround time is 7-10 days. The catalog test number is 70068. This test is recommended as a permanent test for food, kidney, and urine.
A New Bag of Trichs! Trichomoniasis in Large and Small Animal Medicine

Dalen W. Agnew, DVM, PhD, Dipl ACVP, and Steve Bolin, DVM, PhD

*Trichomonas foetus* (*T. foetus*) is a protozoan (FIGURE 1.) that causes trichomoniasis in cattle, primarily where cattle are grazed on open lands in the West. Trichomoniasis is an economically devastating venereal disease of adult cattle that causes early embryonic loss, abortion, and pyometra. It is typically associated with operations that use communal bulls and live breeding. Trichomoniasis is a reportable disease in most states and some states have instituted mandatory testing programs. Cows that are exposed to *T. foetus* typically clear the organism after 3 to 4 months. Bulls, particularly those over 3 years of age, are sub-clinical carriers of the organism and are considered to be infected for life. There is no acceptable treatment for trichomoniasis in cattle, so infected bulls are usually culled to prevent spread of the organism. Consequently, testing bulls for infection with *T. foetus* is the focus of most disease control efforts.

Recently, *T. foetus* has been found in cats, particularly in young cats from shelters, multi-cat households, or cats on show circuits. Recent studies suggest that up to 31% of cats in the US may be infected with this parasite. In cats, *T. foetus* may cause colitis that can lead to intractable large bowel diarrhea. Increased frequency of defecation is seen commonly, and the soft to liquid stool may contain mucus and fresh blood. Although the diarrhea may appear similar to that seen with *Giardia*, most cats tolerate the disease and do not show appreciable weight loss. The diarrhea caused by *T. foetus* in cats may appear similar to that seen with *Giardia*, but feline culture definitively distinguishes these 2 parasites. Preliminary studies suggest that under rare circumstances *T. foetus* may infect dogs, leading to diarrhea. Fortunately, *T. foetus* is not considered a zoonotic threat.

The DCPAH has performed testing for *T. foetus* for several years. Two diagnostic tests are offered currently: the InPouch™ culture system (FIGURE 2) and a PCR assay. There are two InPouch™ systems, one for cattle and a different one for cats. The InPouch™ culture is started by the attending veterinarian. The samples required for testing from a bull are a preputial swab, preputial scraping, or a preputial flush. A vaginal wash sample usually is used from a cow. The sample is deposited into the InPouch™ and shipped to the DCPAH on warm packs for culture (the organism will die and cannot be cultured if the pouch is chilled below room temperature). Culture of the organism requires up to 12 days in the laboratory for cats; the frequency and number of tests that must be done vary among states and cattle sales that require testing bulls for *T. foetus*.

In cats, *T. foetus* is an enteric pathogen and not a venereal pathogen. A Dacron tipped swab sample of the distal colon or a small sample of freshly voided feces is acceptable for testing. Again, if the InPouch™ system is used, the culture is started by the attending veterinarian and it is critical that the culture be maintained at room temperature during shipping. Culture of the organism may take up to 12 days in the laboratory for cats; the order number for the culture test is 60023.

The numbers of combined InPouch™ cultures or PCR assays done for *T. foetus* at the DCPAH from January 1, 2008 to August 1, 2009. Most of these samples were from Michigan, where *T. foetus* in cattle is considered not present or, if present, very rare.

<table>
<thead>
<tr>
<th>Number Tested Since January, 2008</th>
<th>Adult Cattle</th>
<th>Aborted Fetuses</th>
<th>Cats</th>
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<tr>
<td>Number Positive</td>
<td>0</td>
<td>0</td>
<td>5</td>
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BioMed Diagnostics, Inc. offers several educational videos and on-line line questions concerning testing for *T. foetus*.

TABLE 1: The numbers of combined InPouch™ cultures or PCR assays done for *T. foetus* at the DCPAH from January 1, 2008 to August 1, 2009. Most of these samples were from Michigan, where *T. foetus* in cattle is considered not present or, if present, very rare.

References:
Helpful Reminders to Enhance Your DCPAH Experience

Old Forms

Thankfully for us, some of you have been DCPAH clients for many years. As a result, you may have accumulated a stockpile of submittal forms that you reach for each time you send us a specimen. Some of you are still sending us old AHDL forms containing our Fee Hall address, even though we moved five years ago! Please check your file containing MSU DCPAH forms, and if they do not have the new logo (dx) printed on them, PLEASE RECYCLE THEM AND REQUEST NEW ONES! Old forms have invalid test codes and descriptions on them that can sometimes lead to incorrect orders being placed. The most current forms are always available as fillable pdfs on our website (www.animalhealth.msu.edu). We encourage you to use this option or simply order new forms from us with your clinic information pre-printed on them. Thank you!

Making Payments

Your money is important to you, especially in the current economic climate. Why risk a payment going astray that creates inappropriate late fees and telephone charges? Instead, please include the remittance portion of your billing statement when you send your payments to us. This ensures accurate and timely application of your payment to your account. We have over 15,000 clients and process hundreds of checks each day. When you include your remittance slip, it helps to assure that your payment is handled properly.

Are You Using Our New FedEx Mailers?

If you aren’t, you should be! They are a great bargain and will provide you with significant savings in shipping costs. Our insulated mailer is particularly cost effective, as it holds multiple samples with ice packs and costs only $12! Each FedEx mailer includes a “billable stamp” that routes your specimen to us overnight at no cost to you. Unfortunately, these stamps have an expiration date. If you have ordered mailers from us and find that your stamps have expired, simply return the expired stamps to us, and PLEASE remember to include your account number in the envelope. We will send you replacements.