In-House Laboratory Techniques

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Avian medicine can be one of the most frustrating aspects of veterinary science today. Nearly all sick birds look the same - fluffed up, lethargic, eyes closed, anorexic. And yet, as we all know, there are many potential causes for these same clinical signs. Avian veterinarians therefore have a much greater reliance on laboratory tests than do small animal veterinarians. Another frustrating aspect is the flock preservation reflex - a bird's basic instinct to hide signs of illness so as not to endanger itself or the flock. This means that when a sick bird is presented, it is truly sick, almost dead. Combine this with the difficulty in establishing a diagnosis without laboratory tests, we have a situation where avian veterinarians have a need for fast, accurate diagnostic tests. In many cases this may be best provided by a few basic in-house tests.

In this presentation I intend to discuss the in-house lab tests that I use in my surgery. I have asked Richard Miller (Veterinary Pathology Services) to act as my "Devil's Advocate", and between us I hope to bring out the benefits, and pitfalls, of in-house laboratory testing.

Microbiology

Bacterial and fungal infections make up a large proportion of clinical cases. One of the first lab tests that I do is a faecal and/or crop gram stain. A swab is taken from the appropriate site, rolled out onto a slide, air dried and then stained. Examination under oil immersion then gives me an idea as to the bacterial flora within the bird. In psittacine birds and passeriform birds I consider any more than 10% gram negative bacilli, or more than one budding yeast per field, to be pathogenic.

I can then either instigate antimicrobial therapy, or put up some plates for culture and sensitivity testing. In the case of a flock outbreak I feel that identification of the organisms is an important step in isolating the source of the problem. McConkeys and blood agar plates are used, and then the Microbact 12A and 12B system (DP Diagnostics)is used for identification. Note that this will only identify gram negatives. Sensitivity is determined by taking a small colony, mixing it with 2.5 mL of sterile saline, and pouring it onto Sensitest Agar (Oxoid). The excess is drained off, and then sensitivity discs are placed on with a dispenser. I routinely test Linco-Spectin, doxycycline, Clavulox, amoxil, cefotoxamine, trimethoprim and gentamycin. The plates are incubated for 6 - 12 hours. A clear radius greater than 6 mm indicates sensitivity. If time is on my side, and /or the bird is particularly valuable, then I will send a swab to VPS.

Chlamydia

I currently use the Oxoid Clearview test when psittacosis is suspected. I find that faecal tests are unreliable, with a lot of false positives, but that conjunctival, choanal or liver swabs are more reliable. The test still has its uses, and I find myself using it often. Results though, have to be interpreted along with other clinical signs and/or lab tests.

Biochemistry

I use the Reflotron Dry Chemistry Serum analyser for my basic biochemistry profiles (Uric Acid, GOT, Creatine Kinase, Glucose, Cholesterol). It has the advantage of been able to use whole blood, important when dealing with Neophema sized patients. The disadvantages of this machine are the limited number of tests available and its time-intensity. I have yet to use a VetTest, but its potential disadvantage is that it requires serum. VPS offers a bile acid test that I find useful in distinguishing liver and muscle pathology, and I use them for ostriches, where the high CK distorts any potential liver enzyme results.

PCV's can be easily done using a microhaematocrit. These are particularly useful pre-surgery and in lead poisoning cases. Serum protein is determined with a refractometer (with a temperature adjustment).

All of these tests may not be 100% accurate, but I feel that usage enables me to get a "feel" for normal levels, and gives me a good indication of what is happening.

Haematology

I prepare a blood smear using the coverslip technique, and stain it with Diff Quik. An estimated WCC is then obtained using the method described by Larry Vogelnest[1]. While perhaps not technically accurate, once again a feel for what is normal can be obtained with use.

Diff Quik does not give a good enough stain to differentiate cells, and so I do not do a white cell differential. Wright's stain may be better, but I have yet to investigate it.

Cytology

I have done a few impression smears, particularly liver, and stained them with Diff Quik. The same comments apply here as they do for white cells, and I do not feel that I am good enough to make use of this technique. I therefore send all cytology/histopathology to a lab for examination. If you are interested in this area, I would recommend Terry Campbell's book[1].

In summary, I believe that there is a place for in-house lab testing. It will rarely be as accurate as a well-equipped veterinary lab such as VPS, but it has the benefits of been easily accessed, fast and profitable!

References

1. Vogelnest L (1991). Avian Clinical Pathology, in *Avian Medicine*, Proceedings 178, Post-Graduate Committee in Veterinary Science, University of Sydney.

2. Campbell TW (1988). Avian Hematology and Cytology. Iowa State University Press, Ames, Iowa.