Round Table Discussion

The Gram Stain in Avian Practice

The Gram stain is a classic test that has been extensively used in avian medicine and well described in all the avian medicine textbooks. With the progression of avian medicine and the introduction of many new diagnostic tests, I would like to evaluate the importance of the Gram stain in today’s clinical practice.

For this round table discussion, I have invited Terry Campbell, DVM, PhD, Department of Clinical Sciences, Colorado State University, Fort Collins, CO, USA; Michael Bonda, DVM, Dipl ABVP (Avian), Lockwood Ridge Animal Clinic, Sarasota, FL, USA; James K. Morrisey, DVM, Dipl ABVP (Avian), The Animal Medical Center, New York, NY, USA; and David J. Rupiper, DVM, East Petaluma Animal Hospital, Petaluma, CA, USA, to participate in this discussion.

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Associate Editor

Question: Is a Gram stain part of your “well bird” examination?

Dr Campbell:
No. I rarely perform a Gram stain as a routine screening test on a “well bird.” There are several reasons for this. First, the normal flora of a bird is likely to be variable depending upon several factors, such as diet. Thus, detection of abnormal flora in fecal samples based only on Gram stain results may be difficult. Second, I do not trust the Gram stain when used on fecal and other samples that may contain a lot of debris or mucus. Typically what happens is that part of the smear is thicker than other areas of the slide. Therefore, part of the slide is usually underdecolorized and other parts are overdecolorized. It is often difficult to determine which area of the slide represents the true staining. These factors make it too easy to misinterpret the sample and initiate unnecessary treatment of a healthy bird. On many occasions I have witnessed clinically healthy birds treated with antibiotics based solely on fecal Gram stain results.

Dr Bonda:
Yes, I include a cloacal Gram stain in an adult psittacine bird (and a crop Gram stain in a juvenile) in my well bird examination. The Gram stain results are evaluated in conjunction with a complete history, physical examination, a direct fecal examination, fecal flotation, fecal culture (and a crop culture in a juvenile), complete blood count (CBC), a plasma biochemical analysis, and if cost is not prohibitive, a plasma protein electrophoresis, a test for Chlamydophila, a psittacine beak and feather DNA probe, and a polyoma DNA probe.

A Gram stain is a simple, quick, and inexpensive test that most clients can afford. I do not rely solely on the Gram stain result when a bacterial culture is performed concurrently. In clinical practice, often a client is not able to afford appropriate additional testing (cytologic stains or cultures), and a physical examination alone may not reveal an underlying disease. The treatment of a clinically healthy bird with antibiotics based solely on fecal Gram stain results is not the fault of the Gram stain but that of the clinician interpreting it.

Dr Morrisey:
Yes, I typically perform a fecal Gram stain on new birds and birds that are presented for a yearly health examination. I also perform this test on any bird presenting with diarrhea or abnormalities in fecal output or character.

Dr Rupiper:
My brief well bird examination consists of a physical examination, packed cell volume with buffy-coat estimation and total solids, and direct microscopic examination of the feces (wet mount). Based on these findings, additional diagnostic tests may be indicated: viral testing, radiographs, CBC, plasma biochemical analysis, cultures, etc. In my opinion, direct microscopic examination of the feces provides more clinically relevant information than does Gram staining. For example, motile bacteria and trophozoites, bacterial density, bacterial morphology, identification of parasitic ova and cysts,