The bird bank:

How to get the most from bird deposits

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THE EXAMINATION AND INTERPRETATION OF THE GROSS AND MICROSCOPIC APPEARANCE OF BIRD DROPPINGS

Macroscopically bird droppings can morphologically be divided into various components:

a. intestinal component
b. uric acid component
c. urine component
d. caecal component, sometimes present
e. Cloacal component, rarely distinguished grossly
f. Oviduct component, rarely distinguished grossly

Microscopically bird droppings can be divided into various components, namely the above components with sub-components. Sub-components of the various fractions, especially the intestinal component, may include:

1. avian cells
2. avian debris: bits of feathers
3. avian secretions
4. food debris: this can be well or poorly digested and can include parasites and agents of disease of the source of food as well as "pseudo-pathogens" such as cooked yeasts from bread.
5. other ingested materials: grits, pollen grains, assorted arthropod debris, bits of synthetic materials
6. normal microflora
7. abnormal microflora: viruses, bacteria and chlamydia, fungi and yeasts, protozoa, cestodes, nematodes and trematodes, lice and mites and their eggs or egg debris.
8. residues of medications.

Whereas it is helpful for description purposes to divide bird droppings into these components these components should always be viewed in terms of whole bird dropping, all of the droppings available for examination and their sequence of deposition, the whole bird and its environment.

The appearance of bird droppings in health varies with species, age, diet, sex and other hormonal influences. The macroscopic appearance of bird droppings is also influenced by the substrate upon which they fall and the distance which they fall.

When attempting to learn as much as possible, with as much certainty and as quickly as possible, it is helpful to standardise the substrate. I advise my clients where practical to bring their birds in their own cages without cleaning them, but having put a sheet of clean white paper (writing, computer or butcher's paper) over those droppings already passed and to allow some droppings to accumulate on this before covering this with some clean, dry plastic film such as Glad-wrap® or a plastic bag, such that by the time the bird arrives for examination samples of fresh droppings, including urine, are available for examination. The drinking water container should be emptied before travel to avoid spillage.

The number, appearance and composition of bird droppings are often altered by or with disease and by medications. Learning how to recognise normal, distinguish abnormal and interpret these findings in relation to the bird or birds being examined, is a challenge every avian veterinarian faces.

When urine is present on plastic, a partial urinalysis can be performed by passing the edge of an N-Multistix® or Combur-8® stix through the urine, urine refractive index can be determined and urine can also be examined microscopically as in other species. However, the interpretation of findings is more difficult due to mixing with other components in the cloaca.

Fresh moist bird droppings can often be picked up cleanly by running an edge of a clean coverslip under them, and then transferring them to one end of a microscope slide. Occasionally bringing two coverslips together under a bird dropping does a better job. Having transferred the dropping to an end of a microscope slide, another edge of the coverslip can be used to cleanly draw aside and separate sufficient intestinal component from the uric acid component to enable the intestinal component to then be squashed under the coverslip without the microscopic field being masked by uric acid. Whenever possible, be sure to examine at ieast one hot steamy bird dropping this way before it has cooled to room temperature. The microscopic examination should be done under both low and high power with the condenser slightly lowered to increase the refractiveness of any motile protozoa such as *Giardia*, *Hexamita* and of motile bacteria. If excess uric acid is masking the intestinal component of the dropping, the uric acid can be dissolved with a drop or two of sodium hydroxide solution. Whereas this may facilitate examination of food debris oocysts and ova, it is likely to mask the presence of certain protozoa and

bacteria. Once outside the bird, the bactenal, fungal and protozoal populations in faeces can change rapidly and significantly with time. In this case there is little doubt that fresh is best!

Wet unstained intestinal component smears should always be examined under a coverslip - it is false economy not to use one. They should be thin and even. A few drops of warm water or preferably warm saline or Hartman's solution can be added to those samples that are too thick or pasty. **Always** examining the smear under low power first but **also be sure** to examine at least ten fields under high dry with the condenser slightly lowered. Without recourse to staining you can learn to recognise a variety of ova, oocysts, flagellated protozoa, motile bacteria, spermatozoa, budding yeasts, fungi and megabacteria.

It has become customary and routine to perform Gram stains on smears of bird droppings. Perhaps less routine but also of value, at least on some occasions, is also to perform one or more of the following procedures: faecal flotation test, Clearview® or other *Chlamydia* test, Psittacine Beak and Feather Disease virus titre, Diff-quick® test, Sudan 3 stain, acid fast stain, trichrome stain, *Chlamydia* stain, aerobic and anaerobic bacterial culture, culture specific for other organisms.

If possible, before the practical class attempt to answer the following questions, then revise the questions and your answers during or after the practical class:

How many droppings does a normal female nesting budgerigar deposit per hour(s)? Give a range.

What changes from the normal appearance of bird droppings suggest:

a) gizzard dysfunction?
b) liver dysfunction?
c) pancreas dysfunction?
d) intestinal dysfunction?
e) chlamydiosis?
f) renal dysfunction?
g) trichomoniasis in a budgerigar?
h) megabacteria-associated disease in a budgerigar?
i) an intraabdominal mass pressing on the intestines?
j) a cloacal polyp or tumour?
k) coccidiosis?
l) a bird has been eating bread?
m) gout?
n) treatment with enrofloxacin?
o) heavy metal poisoning?
p) that the bird has been stressed?
q) a bird has been eating mulberries?
r) treatment with multi-B vitamins?

s) recent oral treatment with megestrol acetate?
t) thrush?

Which birds that you frequently encounter have functional caeca? Which birds do not?

Which birds that you frequently encounter have a grinding gizzard? Which birds do not?

Which birds normally make projectile deposits?