

## **Albumin and Parrots**

### **Why is there a problem?**

We measure albumin in parrots for the same reasons we do in mammals. It is an essential piece of the biochemistry profile that allows us to assess such varied parameters as hydration status and renal, liver, and gastrointestinal health. The accurate measurement of avian albumin concentration poses two problems for any biochemistry analyzer. First, normal parrot albumin concentration is usually lower than the dynamic range of most biochemistry analyzers. Analyzers are designed to measure the typical albumin concentration found in humans, dogs and cats. The lower end of those concentrations is about 3.5 g/dL. Parrot normal albumin concentration can be as low as 0.7 g/dL. More importantly, the upper end of parrot albumin concentration may only be 2.5 g/dL, which is below the dynamic range of many biochemistry analyzers. So a majority of albumin values in parrots are below the ability of any analyzer to give the veterinarian an accurate measurement. The second reason that avian albumin concentration cannot be measured properly is because the dye binding process used to calculate the albumin concentration is non-specific to parrot species. This can cause reported parrot albumin concentrations to be inaccurate. These facts have been understood for many years and one solution that has been previously proposed was to measure albumin concentration via an electrophoresis (EPH) assay. Theoretically, the albumin concentration measured on the EPH should be accurate as the assay is based on weight and charge of the albumin; not on the inherent properties of a dye binding process or a machine's limitations. Unfortunately, a recent study (Rosenthal, et al) has shown that even the EPH is not an accurate or precise measurement of avian albumin likely due, again, to the small concentration of albumin present in parrots.

### **What can you do about this problem?**

We need to recognize that we may never be able to accurately measure the true albumin concentration in pet parrots. Whereas with mammal patients, we can interpret the albumin concentration and use those results to diagnose disease and guide treatment, we cannot do this in birds with the same degree of certainty. The best solution to this problem is multi-fold. First recognize that the parrot albumin concentration that you receive from a biochemistry analyzer or EPH assay may only approximate the true concentration. Do not make clinical decisions based solely on the albumin concentration but take into consideration the signs, signalment, and other biochemistry values. Remember that the smaller parrots (ie, budgiegar, cockatiel, and lovebirds) normally have albumin concentrations that can range from 0.7 to 1.2 g/dL. View repeated albumin concentration as a trend more than as absolute numbers. The Abaxis Vetscan has been shown to be precise in its measurement of parrot albumin concentration so monitoring trends is a logical approach to decision making

(Johnston, et al). Finally, it is important to remember that the total protein concentration minus albumin concentration gives the calculated globulin concentration. If the albumin concentration is not accurate, the globulin concentration will also be inaccurate.

Rosenthal KL, Johnston MS, Shofer S. Assessment of the reliability of plasma electrophoresis in birds. 2005. *AJVR*, 66:375-378.

Johnston, MS, Rosenthal KL, Shofer S. Assessment of a Point-of-Care Plasma Biochemistry Analyzer and Comparison to Commercially Available Methodology for the Measurement of Total Protein and Albumin Concentrations in Psittacine Birds, *in press*.