



Why Use Protein Electrophoresis?

A broader view of the sum of APP changes is the examination of the overall APR via the use of protein electrophoresis (EPH). This technique utilizes an agarose gel to separate protein fractions into albumin, alpha 1 globulins, alpha 2 globulins, beta globulins, and gamma globulins. EPH does not quantitate single proteins but groups of proteins which are mediators of acute inflammatory process. Alpha 1 globulins include alpha-1 antitrypsin and alpha-1 acid glycoprotein, alpha 2 globulins include alpha-2 macroglobulin and HP, beta globulins include transferrin, SAA and CRP, and gamma globulins are composed primarily of IgG. It is important to note that the relative sensitivity of ELISA vs. EPH methods quantitates proteins at ng/ml and mg/ml levels, respectively. It would then only be expected that 10,000 fold increased expression of a single APP may potentially alter EPH results. That is, importantly, EPH and ELISA are two independent methods with different sensitivity in addressing the course of the APR and EPH does not reflect changes of individual APP.

An important facet of EPH is its quantitation of albumin. Several publications have demonstrated with many species that the results obtained by clinical analyzers may not be accurate as albumin quantitation by EPH as the analyzers have been optimized for the determination of human albumin. In addition, some globulin proteins have been demonstrated to react with BCG, the dye commonly used on clinical analyzers in albumin quantitation. This can lead to an overestimation of the albumin level occurred with specimens from clinically abnormal animals. These findings have often led to the statement that EPH should be used as a gold standard for albumin and globulin quantitation.

Many diagnostic and prognostic uses of EPH have been reported in veterinary medicine. Although rarely diagnostic of a particular disease, it is a good method for the detection of acute and chronic inflammatory processes and stimulation of humoral immunity.