Contributor: Francisco Uzal, California Animal Health and Food Safety Laboratory, San Bernardino, UCDavis

History: Neurological disease and increased mortality was observed in three houses of 6-week-old layer pullets. No gross lesions were observed during necropsy.

Morphologic diagnosis: Cerebellum, leukoencephalomalacia, focally extensive, with thrombosis, hemorrhage, and mild mononuclear perivascular cuffing.

Possible cause/s: Vitamin E deficiency, sodium toxicity.
Comments: This is one of 5, 6-week-old layer pullets with a history of being weak, lame and uncoordinated. There was increased mortality in the house. Histology revealed severe encephalomalacia with thrombosis (similar to what is depicted in the photos of this Diagnostic Exercise) in 4 out of 5 birds examined. Although there was an inflammatory component, it was minor and believed to be consequence of degenerative changes and not a primary response. The two top differential etiologies considered in this case were vitamin E deficiency and sodium toxicity.

Vitamin E in the liver was very low in 3 birds tested (0.40 to 0.45 ppm; reference range: 3-15 ppm), confirming vitamin E deficiency. In addition, the sodium in the brain of the same 3 birds was also high (2400-2500 ppm; reference range: 905-1120). Sodium concentrations can be high with excessive sodium intake or water deprivation. While sodium intoxication may also produce encephalomalacia, thrombosis is not a feature. Furthermore, it is possible that the high sodium levels in the brain of these birds were a consequence of dehydration in recumbent animals that were not able to drink. Unfortunately, the feed was not available for sodium analysis and we cannot rule out that an excess of sodium was also present in the diet.

Although the clinical signs and histological lesions are typical of vitamin E deficiency, it is also possible that vitamin E deficiency and sodium toxicity acted synergistically to produce the clinical signs and lesions observed.

Please send your comments/questions to the whole LCPG list by hitting “reply to all”.

A final document containing this material with answers and a brief discussion will be posted on the C. L. Davis website by the end of the current month (http://www.cldavis.org/lcpg_english.html).