

## News &amp; Comments

## Essential and Non-Essential Amino Acids in Dogs

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Numerous studies have shown anomalies in the serum amino acid profile in people with chronic kidney disease (CKD), including a decrease in the amounts of essential amino acids (EAAs) and an increase in non-essential amino acids (NEAAs). Serum amino acid profiles have been studied in both cats with CKD and dogs with protein-losing nephropathy. Although blood leucine, tyrosine, and threonine reduction were a consistent result in both CKD people and dogs with protein-losing nephropathy, there were several differences between the two species. The current study's objective was to assess the blood levels of EAA and NEAA in dogs with CKD at various IRIS stages, with special attention to calcium-phosphate (CaxP) abnormalities, metabolic acidosis, and protein-energy wasting syndrome.

Between January 2020 and January 2022, veterinary teaching hospital "Mario Modenato" of the University of Pisa nephrology and urology service analysed medical data for client-owned dogs of various breeds, sexes, and weight that had been diagnosed with CKD. Between January 2020 and January 2022, a group of clinically healthy dogs ( $n = 25$ ) of different ages, breeds, and sexes were enrolled in the study with the owners' informed agreement. The dogs in the control group were selected from the pool of blood donors; they were all clinically healthy, had normal blood tests, and had no prior medical history. Using the Kolmogorov-Smirnov normality test, continuous variables were examined for normality.

Not every branched-chain amino acid in the group displayed the same trend. This was a surprising discovery because human CKD has previously been linked to lower serum levels of branched-chain amino acids because of many causes, including metabolic acidosis and a low-protein diet. Except for TRP and CYS, the presence of aberrant serum CaxP did not appear to have a substantial impact on the serum amino-acidic pattern in our dogs. However, it should be noted that the median distribution of both EAAs and NEAAs showed a non-statistically significant decrease. Although the incidence and etiology of PEW in canines with CKD are not fully understood, it is conceivable that these same reasons also contribute to human CKD.

CKD dogs' blood levels of both EAAs and NEAAs were considerably different from healthy dogs' serum levels, notwithstanding the lack of a correlation with the progression of the IRIS stage. In CKD dogs, abnormal blood concentrations of amino acids suggested that pathogenic factors such as inflammation, insulin resistance, and accelerated protein breakdown may play a crucial role.

By significantly reducing both EAAs and NEAAs, PEW appeared to have the most impact on the serum



amino-acidic pattern of CKD problems.

Source: [Veterinary Sciences](#)

**KEYWORDS**

Essential amino acids, non-essential amino acids, CKD, metabolic acidosis, CaxP product, PEW

