Excess phosphorus in cat food damages the kidney

March 21 2018

Credit: jozsitoeroe / fotolia.com

A new study carried out by LMU veterinarians shows that high phosphorus intake, comparable to the average level provided by prepared cat food, can be deleterious to kidney function in healthy cats.

An LMU study has found that phosphate concentrations that exceed the daily intake required for health maintenance by more than fivefold can damage kidney function in healthy cats. The investigation was led by Professor Ellen Kienzle and Dr. Britta Dobenecker of the Chair of

Animal Nutrition at LMU. "For hitherto unknown reasons, some 35% of older cats suffer from chronic kidney disease," says Ellen Kienzle. The results of the new study suggest that excess phosphate has a deleterious effect on indicators of kidney function in cats, and could contribute to the high incidence of chronic kidney diseases in elderly cats. The new findings appear in the *Journal of Feline Medicine and Surgery*.

Earlier work had shown that high phosphorus intake exacerbates the course of chronic kidney disease in cats. Kienzle and her team have now looked at the impact of excess phosphorus on mature and healthy cats. Their results essentially confirm the conclusions reached in a previous study. The new work shows the appearance of glucosuria and albuminuria – both indicators of renal damage – in cats eating high phosphorus diets.

Moreover, creatinine clearance, which is measure of the overall performance of the organ, also dropped markedly within 28 days in cats that received a diet rich in phosphorus. "We were surprised to find that creatinine clearance was so strongly affected within such a short time," Kienzle says.

Tests of commercial cat foods available in Germany, carried out by the consumer organization Stiftung Warentest, have revealed that, in particular, moist food formulations contain on average several times the amount of phosphorus required to keep cats healthy. This level has so far been regarded as harmless. However, the maximum level detected in these tests (nearly nine times the required amount) might be sufficient to damage the healthy feline kidney within a few weeks. The phosphates in animal foods are in part derived from natural sources, mainly bone and cereals. However, pet-food manufacturers also add inorganic phosphates to achieve the appropriate texture and extend shelf life.

Kienzle and Dobenecker are now investigating the impact of different

phosphate sources on feline kidney function, together with the role of phosphate solubility, as these factors have an impact on the bioavailability of phosphate in the diet. Among other experiments, they will compare rates of phosphate excretion following uptake of excess amounts of monophosphates in the form of calcium and potassium monophosphates, respectively. "We would predict that the water-soluble potassium monophosphate has a greater effect on kidney function than phosphate derived from the calcium salt," says Ellen Kienzle. In contrast to bound phosphate provided by natural sources in prepared foods, water-soluble inorganic phosphate additives are immediately available for absorption.

In addition, the impact of excess dietary phosphate on the health of dogs is now the subject of a dissertation in Kienzle's working group. The initial results suggest that the concentration of phosphate in the blood rises significantly following the intake of inorganic phosphates.

More information: Britta Dobenecker et al. Effect of a high phosphorus diet on indicators of renal health in cats, *Journal of Feline Medicine and Surgery* (2017). DOI: 10.1177/1098612X17710589

Provided by Ludwig Maximilian University of Munich