Your Pet Needs This Crucial Vitamin, but Don't Give Her Yours

It's so important that the level in a sick kitty's blood may actually predict her survival. And low levels are often seen in dogs with congestive heart failure. Neither cats nor dogs can make their own, but please don't make this deadly mistake trying to help them.

Reviewed by Dr. Becker

STORY AT-A-GLANCE

- A study concluded that higher levels of 25(OH)D (vitamin D) in hospitalized cats increases their chances of survival
- Study researchers believe the level of a key vitamin D metabolite in the blood of hospitalized cats can predict disease outcome more accurately than other measures
- Cats rely on diet as their sole source of vitamin D, since unlike humans, they do not produce vitamin D in their skin after exposure to sunshine
- Too much vitamin D can be toxic for cats, and most commercial cat foods as well as balanced, home-prepared diets contain sufficient amounts of vitamin D
- If you have a sick pet, measuring vitamin D levels may be something you want to request to determine if supplementation is necessary

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Scientists have discovered that higher levels of vitamin D in extremely sick hospitalized cats can increase their chances for survival. Their findings were published in the online journal PLOS ONE in May 2015.[1] From the study abstract:

> *"The hypothesis of this study was that vitamin D status would predict short term, all-cause mortality in domesticated cats.*
>
> *Serum concentrations of 25(OH)D, together with a wide range of other clinical, hematological, and biochemical parameters, were measured in 99 consecutively hospitalised cats.*
>
> *Cats which died within 30 days of initial assessment had significantly lower serum 25(OH)D concentrations than cats which survived.*
>
> *In a linear regression model including 12 clinical variables, serum 25(OH)D concentration in the lower tertile [lower third] was significantly predictive of mortality. The odds ratio of mortality within 30 days was 8.27 (95% confidence interval 2.54 to 31.52) for cats with a serum 25(OH)D concentration in the lower tertile.*

In conclusion, this study demonstrates that low serum 25(OH)D concentration status is an independent predictor of short term mortality in cats."

Vitamin D Study Involved 99 Cats with Life-Threatening Conditions

Researchers at the University of Edinburgh's Royal (Dick) School of Veterinary Studies in the U.K. evaluated blood samples from 99 cats admitted to the University's Small Animal Hospital with life-threatening conditions. Among the values checked was the level of vitamin D at the time of admission.

The researchers discovered that kitties with significantly higher levels of vitamin D in their blood had better survival rates 30 days after admission than cats with lower levels.

Unfortunately, the study was limited in that it wasn't designed to prove a cause-and-effect relationship, only whether there is a link between vitamin D levels and a pet cat's chances of surviving a fatal illness. Future studies may help scientists understand more about whether vitamin D can help prevent disease in cats, and whether supplementing it in the diets of sick kitties improves survival rates.

"At the moment," says Dr. Richard Mellanby, Head of Small Animal Medicine at the Royal (Dick) School of Veterinary Studies and one of the study authors, "it is difficult for veterinarians to offer accurate prognostic information to the owners of sick cats."[2]

Dr. Mellanby believes the study shows that measuring a key vitamin D metabolite in the blood of hospitalized cats can predict disease outcome much more accurately than many other more commonly used measures. Other significant predictors of a poor outcome for sick cats include reduced appetite and increased blood potassium levels.

Too Much Vitamin D Can Be Toxic for Cats

The benefits of vitamin D to human health are well established. Sources of vitamin D include certain foods and dietary supplements. In addition, humans produce vitamin D in the skin after exposure to sunshine.

Cats, on the other hand, can only obtain vitamin D from their diet. However, it's important to remember that too much vitamin D can be dangerous for kitties. It's a fat soluble vitamin, which means it can build up to toxic levels in the body, leading to fatal kidney and lung damage.

Commercially available cat foods often contain high levels of added vitamin D, and balanced, home-prepared diets typically contain the right amount of vitamin D for healthy cats. Offering a supplement to a kitty eating either of these diets is overkill and could result in vitamin D poisoning.

The U.K. scientists found no significant difference in the mortality rate of cats in the upper and middle third groups in terms of their 25(OH)D levels, so it doesn't seem that supplementing vitamin D in sick cats with normal levels of 25(OH)D would be beneficial.

What About Sick Dogs and Vitamin D?

A Cornell University College of Veterinary Medicine study published in the Journal of Veterinary Internal Medicine[3] concluded that vitamin D might play a role in congestive heart failure in dogs similar to its role in human heart disease.

In humans, vitamin D is essential for proper functioning of the heart, and research has found a direct link between vitamin D deficiency and congestive heart failure. The muscles and nerves of the body rely on precise levels of calcium in the blood to function correctly.

Vitamin D plays a crucial role in maintaining those precise levels through regulation of calcium absorption from the intestines. In humans, vitamin D directly supports heart muscle electrical activity and muscle contraction.

Congestive heart failure is also a common cause of death in dogs. Estimates are that up to 60% of aging dogs have heart problems.

Study Showed Abnormally Low Levels of Vitamin D in Dogs with Congestive Heart Failure

The Cornell study revealed that dogs with congestive heart failure (CHF) have abnormally low blood levels of vitamin D. The researchers noted that, as with humans, low blood levels of vitamin D were linked to poor survival rates in the dogs.

Like cats, dogs don't produce vitamin D in their skin, so diet alone should supply all their vitamin D requirements. Unfortunately, the Cornell study didn't evaluate whether diet was a cause of vitamin D deficiency in dogs with CHF.

They didn't analyze the dogs' diets, but instead relied on information compiled from questionnaires, and made various assumptions about approximate vitamin D intake.

The study also did not address other possible causes for vitamin D deficiency in the dogs with CHF. In humans, heart disease is linked to patient fitness levels and amount of body fat. Vitamin D is fat-soluble and can be isolated in body fat, reducing blood levels. All the dogs in the Cornell study had normal amounts of body fat, so no association between heart disease and body fat could be made.

Another piece of information missing from the Cornell study was whether the dogs with CHF were taking medications that might contribute to their low vitamin D blood levels. Diuretics, which are commonly used to treat heart disease in both humans and dogs, can cause the loss of chemicals in the blood through increased urination. The researchers didn't evaluate whether the dogs in the study were excreting vitamin D in their urine, a situation that could contribute to a deficiency.

Deficiencies aside, the study was the first ever to examine the relationship between vitamin D and CHF in dogs. Much more research is needed, but the study does clearly demonstrate that dogs with CHF have abnormally low levels of vitamin D in their blood, and those deficits decrease their survival times.

Too Much Vitamin D Is Also Dangerous for Dogs

Despite evidence that dogs with heart disease may benefit from vitamin D therapy, keep in mind that for both dogs and cats, vitamin D toxicity is actually much more common than vitamin D deficiency.

As with commercial cat foods, most dog food formulas contain at least the AAFCO minimum recommended amount of vitamin D, as does a balanced homemade diet. Food sources of vitamin D include cod liver oil, cheese, yogurt or kefir, liver, and eggs. These are the vitamin D sources you can provide to your dog instead of a vitamin D supplement.

If you have a sick pet, measuring vitamin D levels may be something you want to request to determine if supplementation is necessary.

Sources and References

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[1] PLoS ONE, May 13, 2015

[2] Phys.org, May 13, 2015

[3] J Vet Intern Med. 2014 Jan-Feb;28(1):109-15