

Calcium & Phosphorous Requirements for Dogs

Drs. Foster & Smith Educational Staff

Calcium and phosphorous are essential minerals in the body. The daily requirements vary depending upon the age and status of the dog or cat. Phosphorous and calcium deficiency and excess can occur and the ratio of calcium to phosphorous (Ca:P) is important.

Calcium

Of all the minerals, calcium is required in the greatest amount. Calcium is essential in the body for many functions including bone formation, blood coagulation, muscle contraction, and nerve impulse transmission. The calcium content of food ingredients varies widely. Bones, dairy products, and leguminous plants contain large amounts of calcium, whereas most cereal grains, meat, and organ tissues contain small amounts.

Phosphorous

Phosphorous is the other dietary mineral required in a relatively high amount in the diet. Phosphorous is required at levels slightly less than calcium. Meat or organ meats are high in phosphorous but relatively low in calcium. Phosphorous deficiency is a significant problem in herbivores and is probably the most common mineral nutrition deficiency present in animals worldwide. However, phosphorous deficiency occurs very infrequently in dogs and cats. In fact, excessive dietary phosphorous which accelerates the progression of renal failure is much more common.

Calcium:phosphorous ratio

Many foods that are low in calcium are high in phosphorous, and in addition, many foods that are high in calcium are equally high in phosphorous. Therefore, providing the correct calcium to phosphorous ratio in the diet can be difficult unless the proper minerals are added. It is very important that calcium and phosphorous be fed at the correct ratio of around 1.2 parts of calcium for each 1 part of phosphorous (1.2:1).

Calcium and phosphorous requirements of dogs and cats

Growth Stage	% Calcium in the Diet*	% Phosphorous in the Diet*
Peak growth and lactation	1.0-1.8	0.8-1.6
Half grown and last trimester of pregnancy	0.8-1.5	0.6-1.2
Adult non-reproducing	0.5-0.9	0.4-0.8

* on a [dry matter basis](#)

Calcium deficiency

Calcium deficiency was once a more common disease. It resulted primarily from animals fed diets high in meat and organ meats, which are high in phosphorous and low in calcium. If these animals were not adequately supplemented with calcium they would develop skeletal abnormalities often referred to as rickets. The bone could become soft or very thin and brittle. Fortunately, one of the benefits of commercially prepared and balanced diets, is that except for low calcium levels during pregnancy and lactation, ([eclampsia](#)) calcium deficiency rarely occurs any more and switching to a balanced diet can usually correct this problem. Feeding adequate calcium without the correct amount of phosphorous can prevent adequate uptake and utilization of the calcium, thus the calcium:phosphorous ratio is very important.

The calcium:phosphorous ratio is very important.

Calcium excess

Feeding high calcium diets with excess calcium is often blamed for contributing to bone problems in young, rapidly growing dogs. There does appear to be a link between the incidence of [hypertrophic osteodystrophy \(HOD\)](#), [osteochondritis dissecans \(OCD\)](#) and [hip dysplasia](#), and the overfeeding of calcium. In recent studies, researchers fed dogs calcium at a much higher than recommended amount, and compared the incidence of disease in dogs that were fed normal or less than normal calcium levels. As would be expected, the animals that were overfed calcium showed increased incidence of skeletal problems

including hip dysplasia.

Many people have embraced these studies and interpreted them to imply that by feeding a puppy food slightly lower in the recommended amounts of calcium and phosphorous to large breed puppies, the puppies will have a decreased incidence of hip dysplasia. However, there are no studies that show that these low calcium foods result in less hip dysplasia in large breed dogs than a normal well-balanced puppy food. While feeding a special formula large breed puppy food to your puppy is not bad, there are no concrete studies that show it is better than a balanced puppy food formulated for all puppies.

Summary

Calcium and phosphorous work together in the body to maintain the growth and structure of the skeletal system. Deficiencies or excesses of both can create skeletal problems especially in young puppies. It is very important that the calcium and phosphorous be fed in the correct ratio. Problems with calcium and phosphorous rarely occur anymore due to the easily available commercial pet foods that are properly balanced. When problems arise, it is when owners feed a homemade diet or over-supplement, especially with young, rapidly growing puppies. There are no studies that show that the new large breed puppy foods reduce the incidence of skeletal problems, but they appear to provide adequate nutrition, and over time, they may be shown to be beneficial.