

Vitamin D and Alpacas  
The Importance of Vitamin D Supplementation in Alpacas  
By Sarah Donahoe  
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Over the past several years, I have seen firsthand, the importance of vitamin D supplementation and unfortunately, the consequences of vitamin D deficiency. In the most severe form of vitamin D deficiency, commonly referred to as rickets, problems include permanent deformities, bone fractures and ultimately death if not corrected in time.

Vitamin D is an essential vitamin and critical for bone growth and development. It is one of the fat soluble vitamins (A, D, E and K) which means they are stored in the body and thus have the potential for causing adverse effects with high levels. Vitamins B & C are water soluble and for the most part do not cause toxicity, although in humans you can have a neuropathy from excessively high levels of one of the B vitamins. In the simplest of terms, Vitamin D is activated by sun exposure. In South

America, alpaca's exposure to sunlight and resultant vitamin D absorption is much higher than in US. Think high elevation and thin atmosphere.

Early signs of Rickets are trouble with their gait. Examples include not stretching out the fully when walking, short striding, crouching, slower to move and get up and less likely to get up when approached. Alpacas will lie around more, even grazing in an area lying down. Rickets is painful. Crias stop growing. Limbs will eventually become "deformed" meaning incorrect angulation will occur. Hind quarters start to cow sickle, and you might see sickle-hock. Calf-kneed in the front, buck-kneed or knock-kneed also in the front. The alpaca will appear unsteady, which they are, and will walk with it's hind legs crossing under them. They don't run.

My first encounter with vitamin D deficiency was several winters ago. That winter was particularly gloomy and my Fall crias presented with subtle gait changes. They looked like they were in pain, took on a crouch appearance, and were less active. This was particularly noticeable in the darker animals. We started them on vitamin D injections and their symptoms began to subside within a week. At that point we instituted a vitamin D protocol on our farm.

Two years ago, I boarded a female with a 7 month cria at side. The two had been living on extremely poor quality hay, almost straw in appearance and probably in nutritional value. At the time the cria was in full fleece and it was both very dense and very long. Amber (pictured here) was the size of a 1-2 month old cria. She weighed somewhere in the area of 35 pounds. She basically did not walk and nibbled while laying in an abnormal kush position. Amber was in a great deal of pain and was pre-ruminant. She was no longer able to stand under her mom to nurse because of the pain and instability. She required vitamin D injections every two weeks, blood draws to monitor her levels, BoSe, Vitamin B injections, Banamine and Meloxicam for pain, joint supplements with glucosamine/chondroitin, and oral feeding via drench gun with whatever concoction I could make for her. Her abdomen was very large, probably due to a stretched C1 from eating the poor quality hay and filling up her vault. Paradoxically, she could only take in 3 oz at a feeding of goat's milk. It was a long road to recovery but today, Amber has recovered. Her rehabilitation took 5 months. She is no longer on pain medicines but will probably stay on the joint supplements indefinitely. Her front legs have permanent deformities. Fortunately, she has not grown to her full adult weight, so her joints do not need to support that additional weight.

We had another cria board at our farm this past spring. Born last Fall, this cria is dark brown and weighed 35 pounds at the age of 7 months. She was given vitamin D injection upon arrival but even so, she soon started showing signs of lameness and lack of activity. We aggressively started treatment for vitamin D deficiency and today she is thriving. She has gained 25 pounds over 3 months and is pain free, running, and has a normal gait and conformation. She is not on any medications other than the vitamin D she will receive this Fall and Winter.

Darker alpacas are more susceptible to having low Vitamin D levels. I start administering injectable Vitamin D to those less than 2 years of age in October every year and continue every two months through and including the March dose. If it's a gloomy winter, everyone gets Vitamin D injections. So for crias born in the Spring, I wait until the Fall to give them the Vitamin D. Winter months that are particularly gloomy I will administer vitamin D to the entire herd. There is an oral form of Vitamin D supplements that can be administered to healthy alpacas as their routine. For ill alpacas, I give injectable Vitamin D. This is because roughly only 60% of oral Vitamin D is absorbed and I want to be sure they are getting the full amount.

Vitamin D injections can cause soreness at the injection site. Make sure to "tent" the skin when administering it and then gently rub the solution under the skin to spread it out. Read the label for correct dosing---There are two concentrations that I am familiar with and I use the 70,000 IU per ml concentration. I don't give more than .5 cc to the crias at any one time.

For Rickets and when administering vitamin supplements aggressively, monitor Vitamin D and Phosphorus blood levels. Although there are no reference ranges "yet" for alpacas. Consider Vitamin D supplementation in situations with any prolonged illness. It's one of my first line drugs, especially in those slow to grow crias and yearlings.

Poor nutrition is a contributing factor. Alpacas need good quality hay. This doesn't mean high protein hay, but hay with a good TDN (Total Digestible Nutrients) and RFV (Relative Feed Value). Have hay analyzed. This means each cutting and from different fields. Analyze fields where they graze as well. RFV should be 95-105, TDN 55-65. As an example, if RFV is low, the hay probably has a lot of fiber without nutritional value. They are just filling up.

My protocol for vitamin D deficiency/rickets is vitamin D injection every 2 weeks, 0.5cc until I get the Vitamin D level up to normal range. There is support in the literature for adding Ca<sup>++</sup> as well. I give BoSe (immunity). Start them on Vitamin B complex for the rumen. Depending on how long or how stunted their growth, I might add Thyroid-L, usually 3-4 mg daily. They are started on pain meds, Banamine daily, and I am not so concerned about gastric ulcers. I've given Banamine for 3 weeks without problem. Also start them on Meloxicam orally 2mg/kg as a loading dose, one time, then 1mg/kg every other day. Banamine is good as an anti-inflammatory and Meloxicam is good for bone pain. You can stop the Banamine at any time, the sooner the better, but it's very important to get the pain under control. If concerns about their stomach and potential for ulcers, put on Protonix, 1mg/kg injectable, once a day. If I think gut absorption for nutrition is a real problem, I give them frozen colostrum, 1cc/kg daily orally for 2 weeks, but this is rare that I use it. If they are not chewing, or if they are preruminant, which many crias are by the time you diagnose them, keep on Vit B complex, add Probiotics/yeast/yogurt. Maybe alfalfa. There are numerous over the counter supplements to give to ruminants.

I think as time goes on, we will learn more about the importance of vitamin D supplementation in alpacas. Phosphorus administration is being investigated as a possible supplementation as well.