

## *Hypocalcemia in Guinea Pigs*

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Hypocalcemia is a condition occasionally seen in pregnant or nursing sows and satin breeds of guinea pigs. The cause may or may not be known, however, the result is low blood calcium levels. Because calcium is necessary for normal nerve and muscle function, hypocalcemia may lead to difficulty during labor (dystocia), weakness, twitching, malocclusion of teeth (chronic cases) and death (severe cases).

Calcium is finely regulated in mammals with the help of three hormones: Parathyroid hormone (PTH), active Vitamin D and calcitonin. When blood calcium levels are low (hypocalcemia) the parathyroid gland releases PTH which causes the bones, with the help of Vitamin D, to breakdown (releasing calcium to the blood). PTH also acts on the kidney to cause reabsorption of calcium and conversion of inactive Vitamin D to active Vitamin D. The activated Vitamin D promotes absorption of calcium from the intestines. Getting calcium from the bones, the kidneys and intestines helps raise the blood calcium levels back to normal.

If blood calcium levels are too high (hypercalcemia) the thyroid gland releases calcitonin which causes the kidneys to excrete calcium. Calcitonin also inhibits the release of calcium from bones. In pregnant and lactating (nursing) animals calcitonin prevents bone resorption and diverts dietary calcium to the developing fetus or lactating neonates. Due to the extra need for calcium in pregnant and nursing sows a greater amount of calcium and Vitamin D are needed in their diet. This can usually be accomplished by offering unlimited high quality feed with adequate protein, calcium and Vitamin D during late pregnancy and while nursing the young. Proper diet is usually sufficient to prevent hypocalcemia in normal cavies. In satin cavies, with calcium metabolism problems, or sows with large litters supplementation with calcium may be necessary. Treatment with injectable or oral calcium supplements is recommended until symptoms resolve. Small animal dosing for oral calcium is 50-100 mg/kg/day divided 3-4 times a day as needed (Plumb).

Caution must be used to avoid over-supplementation with calcium or Vitamin D in rabbits and cavies. Excess calcium is flushed out through the kidneys and can lead to kidney, ureter, bladder and urethral stones (urolithiasis). Excessive Vitamin D in the diet can lead to metastatic mineralization of internal organs as well as urolithiasis. Cavies are unusually prone to metastatic mineralization (compared to rabbits and other rodents). A recent example of metastatic mineralization occurred in spring and summer of 2012 when excessive Vitamin D was accidentally mixed into several brands of guinea pig food leading to many devastating losses within our cavy fancy community.

In contrast to the metastatic calcification, the condition that we see in many satin breeds involves hypocalcemia. Affected animals have low ionized calcium levels, and very high PTH levels. It is unknown at this time if it is a genetic disease linked to the satin coat. It is also unknown whether it is a primary disorder of calcium metabolism leading to secondary kidney disease (as seen in older rabbits and cavies-

Harkness) or if it is a primary kidney disease with secondary hyperparathyroidism. One thing that we do know, the low calcium levels lead to very high PTH levels and that causes the bones to continuously breakdown to release calcium and may lead to 'osteodystrophy' (the other name given to satin disease). We are currently evaluating blood samples from satin and non-satin cavy breeds and hope to have some answers very soon.

**References:**

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