



## Pet Hospital of Peñasquitos

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### Feeding Insectivorous Reptiles and Amphibians

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Insectivorous reptiles and amphibians are popular pet animals often purchased by well-meaning individuals who know little about their dietary needs. If fed one or two types of insects without supplementation they eventually suffer from severe calcium deficiencies. How can we avoid this? To avoid this we must first appreciate the problem.

Insects have a poor calcium (Ca) to phosphorus (P) ratio; that is they have much more P than they do Ca. Therefore reptiles and amphibians (herps) that eat only insects don't get enough Ca in their diet. Over time this results in the herp resorbing Ca from their bones to meet metabolic needs for Ca. As the bones are resorbed they become soft and break easily and the herp lays down scar tissue to reinforce bone so the limbs distort and thicken. Eventually the problem gets so severe the herp has trouble moving, they can no longer eat, and they may develop tremors. If not treated they will die. Severe Ca deficiency is called nutritional secondary hyperparathyroidism, metabolic bone disease or fibrous osteodystrophy.

How can this be avoided? All insects should be dusted with Ca gluconate, carbonate, citrate or lactate. The calcium should not have any P in it, as insects are already high in P and any additional P will make it difficult to achieve a positive Ca to P ratio. A recommended Ca supplement is **Rep-Cal Phosphorus free Calcium Ultrafine Powder without Vitamin D** from Zoo Med, available in many pet stores. To dust insects, place them in a plastic bag with the Ca powder and shake. The dusted insects should be offered right away as they will groom off the Ca within several hours. Many geckos, particularly reproductively active females and young growing animals, will take powdered Ca directly from dishes left in the cage. Keep in mind that multivitamins are never a good source of calcium regardless of what the label may say.

The calcium content of insects should also be improved by feeding them Ca enriched diets for several days (this is called gut loading). Fortified cricket diets are now commercially available (we recommend **Mazuri Cricket Diet** for 2 or more days before the insect is fed to the herp). Powdered monkey biscuits, dog, cat or hermit crab food, fresh fruit or vegetables do not have enough Ca in them to be useful for gut loading insects. Crickets will selectively eat mineral-poor fresh foods, such as fruit and vegetables, in preference to a Ca fortified rations if given the option so don't give them the option. Feed only the gut loading diet to the crickets. Crickets that eat little in the pet store, or the herp's cage, before being consumed, are nutritionally inadequate for reptiles and amphibians.

In addition to Ca, one must offer insectivores a wide variety of insects. Some commercially available insects are crickets, waxworms, mealworms, mighty mealworms,

and super mealworms. Some advocate crushing the heads of larger mealworms before feeding so that they are less likely to perforate the stomach. Fruit flies, especially vestigial or wingless varieties, are useful for small frogs and neonatal chameleons. Seasonally available insects such as flies, moths, cicadas, grasshoppers, bees (remove stingers), cockroaches, some caterpillars, and other insects should also be offered. Sowbugs (pill bugs or roly polys) are terrestrial crustaceans (isopods) avidly taken by many insectivores and are a good source of Ca. Fire flies are toxic and should not be fed. At night insects can be collected around lights or concentrated with funnel traps. During the day sweep nets can collect insects from vacant lots or fields or they can be caught by hand. Insecticide or pesticides exposure from wild caught insects is generally never a problem, but use common sense; if all the insects are dying and twitching one probably shouldn't use them. In addition, many insectivores will eat baby mice (pinkies), hatchling finches, earthworms, slugs, and snails, which are excellent supplements. Snail shells are rich in calcium. For owners who object to live baby mice, pinkies can be purchased frozen from many pet stores and thawed in warm water just prior to feeding.

Even with proper Ca supplementation herps can develop Ca deficiencies if they don't get enough Vitamin D, a hormone that aids in Ca absorption from the gut. Unfortunately, vitamin D is stored in the bodies fat even if over supplemented, can be toxic with long term supplementation and we have little idea how much or how little reptiles need. Play it safe and dust insects with multivitamins instead of Ca only once or twice a month. It is safer to allow the insectivore to synthesize its own vitamin D as needed. Active vitamin D is formed in the skin after ultraviolet (UV) light strikes it of the right wavelength (290 to 320 nanometers). Sunlight is by far the best source of UV light and should be used whenever possible. Remember that glass and most plastics don't transmit UV light.

If strictly indoors an alternative is to place fluorescent UV lights 24 inches or less from your reptile or amphibian without glass or plastic in between. A wide variety of these lights are now made for reptiles, see our Recommended Reptile Products list for what type of ultraviolet lights we suggest. Lights should be left on for 12 hours per day and turned off a night.

Sound nutrition is essential to the long-term health of your insectivore. Provide a wide variety of insects. Make sure the insects are well fed with a high Ca diet and dust insects with Ca just before you feed them to your insectivore. Once or twice a month dust them with a multivitamins containing vitamin D3. Make sure they have adequate UV light exposure. With attention to these details, you can ensure a healthier, longer life for your herp. If you suspect your reptile or amphibian is already suffering from a Ca deficiency see your reptile veterinarian right away!