Using a Commercial Gut-Loading Diet to Create a Positive Calcium to Phosphorus Ratio in Mealworms (*Tenebrio molitor*)

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Mealworms (*Tenebrio molitor*) are one of the most common feeder insects fed to exotic animals due to their high acceptance rate, larval longevity, and ease of care. Unfortunately, in their natural commercial state, they are severely deficient in calcium and can predispose exotic animals to hypocalcemia and related metabolic disorders. Gut loading insects with calcium-rich diets is recommended to improve the insects' nutrient content and to achieve a calcium to phosphorus (Ca:P) ratio of at least 1:1; however, there are few commercial gut loading diets specifically made for mealworms. In this study, mealworms were gut loaded with a newly developed high calcium mealworm diet for 0, 24, or 48 hours. All mealworms were analyzed for dry matter (DM), moisture, calcium, and phosphorus at each time point. Due to the dry nature of the diet, moisture content decreased over time (mean moisture content= 75%, 70%, and 66% at time 0, 24, and 48 hrs, respectively). Calcium content was significantly increased by 24 hrs ($p=0.011$) and remained elevated at 48 hrs for both the as fed and DM measurements (median calcium DM: 0.07%, 3.5%, and 3.7% at 0, 24, and 48 hrs, respectively). Ca:P ratios were also significantly increased for both the 24 hr ($p=0.028$) and 48 hr ($p= 0.028$) periods (median Ca:P DM:1:20, 3.2:1, and 3.6:1 at 0, 24, and 48 hrs, respectively). This data supports the diet's claim to provide a positive Ca:P ratio in mealworms fed the diet for 48 hours.