

Feeder Insect Nutrition Facts for Reptile Keepers

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How often do you check the nutrition facts on the food you eat? Depending on your fitness and dietary goals, you probably pay attention to carbs, fat, protein, and vitamins. Paying attention to what you eat and pursuing a balanced diet is part of staying healthy as a human. Similarly, paying attention to what you feed your reptiles is key to keeping them healthy.

Both insectivorous and omnivorous reptile species need to eat bugs as part of a balanced diet. But just like fruits and vegetables have different levels of nutrition, so do different kinds of feeder insects. Knowing the nutrient ratios of the insects you give to your reptiles can help you provide more precise nutrition for your reptiles' individual needs.

Nutrients

The nutrients that you want to pay attention to are Protein, Fat, Fiber, and Ash.

Protein

Protein is essential for building and maintaining muscles, as well as assisting proper organ function and providing energy. High protein insects are great for helping sick or injured reptiles recover, as protein is used for cell maintenance and repair.

It is advised that strict insectivores (reptiles that only eat bugs, no veggies) must be fed a variety of insects to make sure they get the nutrients they need, as some feeders are higher in nutrients than others. Varying gut loads can also help in this respect.

Fat

Fats in insects are generally unsaturated, while birds and mammals (what humans eat) tend to be saturated. However, a high fat diet is still unhealthy for reptiles. The fats may be "healthy" by our

considerations, but fat as a nutrient is very high in energy: 9 (kilo)calories per gram of fat, versus 4 (kilo)calories per gram of protein or carbohydrate.

Excess energy gets converted to fat, which can contribute to obesity in pet reptiles. Obesity is common in this setting, as captive reptiles typically get less exercise and more food than in nature. Furthermore, overzealous keepers who like to "spoil" their pets with treats and extra food can also drive them to obesity.

That being said, a no-fat diet isn't the solution either. It doesn't work for humans and it doesn't work with reptiles. Fats are essential for a variety of functions:

- Assists absorption of certain vitamins (vitamins A, D, E, K)
- Cushions internal organs
- Helps create fat stores for brumation and egg laying
- Helps maintain body temperature

The *Merck Veterinary Manual* recommends that linoleic acid (Omega 6 fatty acid) be included in the diet for overall health. All insects except roaches contain linoleic and linolenic acids, so variety is beneficial.

Fiber (Carbohydrates)

Fiber in insects comes mostly from chitin, or the insect's exoskeleton. So basically, it's a complex carbohydrate — the good stuff. The amount of fiber in an insect is typically very low; high amounts can lead to digestive issues if fed too often or in excess. Insectivores are better able to digest high levels of chitin than frugivores/herbivores or even omnivores, as their bodies are built to handle it.

The hardness of an insect's exoskeleton does not indicate higher fiber levels (or chitin content).



Instead, it's due to certain protein chains used to reinforce the exoskeleton.

Ash

What the heck is ash? It's the leftovers — the parts of the bug that aren't protein, fat, or fiber. This is typically composed of salts, minerals, and metals, including the insect's gut contents. Higher levels of ash, then, can be assumed to correlate with higher levels of vitamins/minerals as well as a larger gut capacity of the feeder insect.

Ca:P — Calcium to Phosphorus Ratio

You've probably seen this mentioned in the context of supplements. That's because like UVB and vitamin D3, knowing how to balance your reptile's dietary calcium and phosphorus intake is critical to managing its health.

Reptiles require twice as much dietary calcium as they do phosphorus. This is because in order to properly metabolize (or digest) phosphorus, calcium must be present. In other words, they require a dietary calcium to phosphorus ratio of approximately 2:1. When there isn't enough calcium for the reptile's body to properly process phosphorus, it will steal calcium from bones and other stores. Over time, this repeated robbery of calcium can lead to MBD.

Most insects contain more phosphorus than they do calcium, which is why we dust with calcium powder (a common exception is black soldier fly larvae, and we'll get to that in a bit). Calcium supplements are designed to correct the natural imbalance between calcium and phosphorus. When choosing a calcium powder, make sure that it does not contain phosphorus or more than 5000 IU/kg of vitamin D3.

- Arcadia
- Miner-ALL
- Repashy Supercal

If you have a calcium-deficient reptile, Repashy RescueCal+ is a good choice to help them recover.

“Dry Matter” vs “As Fed”

Most insect nutrition is measured in “Dry Matter,” or nutrition of an insect based on its nutritional value when dried out. Moisture content (“As Fed”) can distort individual nutrition percentages. However, when comparing nutrient value between feeder insects, the opposite holds true: As Fed is more accurate.

Fortunately, if you know the moisture percentage of a feeder, you can convert from As Fed to Dry Matter basis and vice versa with a little basic math.

Converting from As Fed to Dry Matter:

Divide the percentage of desired nutrient As Fed by the percentage Dry Matter. The result is the percentage of that nutrient by dry weight.

Converting from Dry Matter to As Fed: Multiply the percentage of desired nutrient on a Dry Matter basis by the percentage of total Dry Matter. The result is the percentage of that nutrient As Fed.

Why should you care? Knowing these percentages gives you the knowledge to make educated decisions about which feeders to give your reptiles, and how often, based on individual needs.

ReptiFiles' Chart of Feeder Insect Nutrition Facts

By this point you're probably wondering how accurate this information can be. Of course, the specific nutritional value of any given feeder insect will vary depending on the quality of its gutload and the breeder's insect husbandry. This data assumes that each feeder is properly gutloaded and healthy, and has been averaged from the sources of nutritional information that I've found for each type.

The following data is presented “As Fed,” and has been rounded to the nearest percent for simplicity's sake.

<i>nd = No data</i>							
FEEDER	MOISTURE	PROTEIN	FAT	FIBER	ASH	Ca:P RATIO	NOTES
American cockroaches	75%	17%	3%	3%	nd	nd	<i>(Periplaneta americana)</i> canned only
Black soldier fly larvae	64%	17%	11%	6%	5%	variable	Also known as Phoenix worms, NutriGrubs, or calcium worms.
Butterworms	60%	16%	17%	1%	1%	1:18	High fat and phosphorus; treat only. Butterworms secrete an acid-like substance that can burn gecko skin.
Crickets	73%	18%	6%	2%	2%	1:9	<i>(Acheta domesticus)</i> High calcium crickets have a 1:1 Ca:P, and pinheads are 1:6
Death's Head roaches	79%	11%	nd%	nd%	0%	nd	
Discoid roaches	66%	20%	7%	3%	1%	1:3	
Dubia roaches	65%	21%	9%	5%	1%	1:3	
Earthworms	82%	11%	3%	2%	1%	1.5:1	Do not buy worms raised for bait.
Fruit flies	70%	21%	5%	5%	2%	1:10	<i>(Drosophila melanogaster)</i>
Grasshoppers	72%	20%	2%	5%	2%	nd	<i>(Phymateus saxosus)</i> Farm-raised only. Wild individuals are likely to be toxic due to milkweed diet.
Grasshoppers	71%	21%	2%	4%	1%	nd	<i>(Valanga nigricornis)</i>
Giant mealworms	nd	17%	21%	nd	nd	1:3.5	High fat; treat only. Not the same as superworms.
Hornworms	85%	9%	3%	1%	1%	1:3	DO NOT FEED WILD-CAUGHT: TOXIC
Lesser Mealworms (Buffalo beetle larvae)	65%	19%	10%	nd	2%	nd	<i>(Alphitobius diaperinus)</i>
Locusts	62%	22%	9%	4%	n/a	1:6	<i>(Schistocerca gregaria)</i>
Mealworms	66%	18%	10%	2%	2%	1:7	
Giant Mealworms (high calcium)	nd	15%	17%	nd	nd	1:3.5	High fat; treat only. Not the same as superworms.
Mealworm Beetles	63%	25%	7%	6%	2%	nd	

FEEDER	MOISTURE	PROTEIN	FAT	FIBER	ASH	Ca:P RATIO	NOTES
Nightcrawlers	84%	10%	2%	2%	2%	1.5:1	Do not buy nightcrawlers raised for fishing bait.
Red Runner roaches	71%	18%	6%	2%	2%	nd	(<i>Blatta lateralis</i>) Also known as the Turkestan cockroach or Rusty Red roaches.
Rice Worms	75%	16%	2%	4%	nd	1:6	
Silkworms	79%	13%	2%	3%	1%	1:2.4	Silkworms fed artificial diet are significantly more nutritious than those raised on mulberry leaves only. Data is averaged between the two.
Silkworm pupae	76%	15%	6%	2%	1%	nd	
Snails (without shell)	76%	19%	1%	3%	2%	nd	Based on garden snail, <i>Achatina fulica</i> . No data available on nutrient value of snails with shells, but shell presence is known to correct calcium imbalance.
Superworms/Zophoba worms	60%	19%	16%	4%	1%	1:18	High in fat and phosphorus; treat only.
Superworm/Zophopa Beetles	62%	26%	5%	nd	2%	nd	
Wax worms	62%	14%	18%	3%	1%	1:7	High fat; treat only.

<https://reptifiles.com/feeder-insect-nutrition-facts-chart/?fbclid=IwAR1b9UrH2qXT-kewdeUpwB4ltqZ9DtTrbyoW9-Rc5fKyv9u6GGCgzNx9yNo>



Colorado Reptile Humane Society
www.corhs.org