Where Do Hummingbirds Get Their Energy?

Such a high-octane lifestyle can only be matched by multiple sugar highs.

Unique among avians, hummingbirds can be thought of as nature's little hoverboards—except, of course, they don't explode into flames. Their fighter-jet acrobatics are as dazzling as their plumage, and they're the only birds that can fly sideways and backwards. But the same physics that sets them apart also exacts a hefty price.

As the world's smallest birds, hummingbirds have a high surface-area-to-volume ratio. That means they lose a lot of heat through their skin (the same way, for example, small ice cubes melt faster than big ones). The problem is compounded by a lack of downy feathers, the fluffy insulation that keeps most birds warm. Skipping the down shaves weight, but the birds must compensate by refueling constantly, consuming two or three times their body weight every day.

That's why hummingbirds love nectar—energetically speaking, it's like rocket fuel. They will visit multiple flowers in a minute, lapping up three to seven calories daily. That may seem like a trivial amount, but when scaled to the size of a human, it translates to about 155,000 calories a day. (If the birds were any smaller, it would be physically impossible for them to eat enough to stay alive.) As a result,

hummingbirds are territorial. They stake out flowers and feeders, defending a food source at all costs—even at the cost of having a social life.

Unlike many other birds, hummers don't hang around in flocks (except when they concentrate near food); males and females don't even raise their families together. Mating takes about half a second, after which the female zooms off to build a nest, lay eggs, incubate them, and raise the chicks by herself. The only exception to this rule occurs in the tropics, where several species of hummingbirds display at "leks"—places where males get together to vocalize and show off for females. But even lek mates don't end up sticking it out for long periods of time.

Because hummingbirds have such high metabolism, even sleep could prove fatal. Going for several hours without refueling could cause them to starve. Luckily, the birds have evolved an extreme solution: At night they enter a state of controlled hypothermia, slowing their breathing and heart rate and drastically lowering their body temperature to save energy. On a particularly frigid night, a hummingbird's metabolism can drop by as much as 95 percent.

Because the birds have few natural predators, life expectancy is mostly determined by their own intense biology. As far as we know, hummers age about 10 times faster than humans. They seem to have a high rate of heart attacks, ruptures, and strokes—not all that surprising given the fast pace of their lifestyle (up to 62 wingbeats per second, to be exact). If a hummingbird slows down, it dies; its existence leaves no room for laziness. So in the end, these birds essentially blow themselves out.