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Hummingbirds Refuel While in Flight

This compensates their high metabolism

Scientists have discovered an unusual trait in the metabolism of the hummingbirds. Most warm-blooded animals must consume carbohydrates or energy food hours before intense exercise, but hummingbirds can refuel in mid-flight. In a matter of minutes after sucking sugar-rich nectar, the rufous hummingbird (*Selasphorus rufus*) uses the newly ingested sugars to fuel more flying and hovering so it can feed further. This special adaptation is due to the accelerated metabolism rate of these birds. Hummingbirds have the highest energy consume of any warm-blooded animal reported to its size, with a heart rate of up to 500 beat-per-minute, asked by fast wing beats and sustained hovering. These birds are nearly always on the edge of starvation and they have to ingest more than its body weight in nectar daily. In a lab experiment, Kenneth Welch and Raul Suarez of the University of California, Santa Barbara gave hungry hummingbirds cane nectar with level of the carbon-13 isotope (the normal carbon isotope is 12). While the birds were eating, the scientists measured their oxygen intake-used to calculate energy consumed-and the carbon in their breath. They detected that within 20 minutes of feeding, more than 90 percent of their energetic expenses derived from the cane sugar. If we compare this with humans, an elite cyclist at 60 percent of his maximum aerobic rate can only support 15 to 30 percent of his energy needs with consumed sugars. He has to eat a high carbohydrates meal the night before an event in order to fill his muscles with energy substances. "This is the first time anybody has shown a vertebrate animal able to support such a high fraction of exercise metabolism with very newly ingested sugar," Welch told.