

## Bats fill mixed fuel

**During autumn, migratory bats use a combination of fat reserves and food to fuel their strenuous long-distance flights to the south. This is reported by researchers from the Leibniz Institute for Zoo and Wildlife Research in the “Proceedings of the Royal Society of London”.**

Songbirds that migrate at night, such as the blackcaps, only use their fat reserves as a fuel to power their migratory flights. This is the only source for energy since they are not capable of hunting insects during the darkness of the night when they migrate. Yet, mammals are not capable of fuelling high metabolic rates exclusively by fat oxidation - otherwise human obesity would be unknown to modern society.

Therefore, the team led by Christian Voigt investigated which fuels migratory bats use to power their long-distance flights. In autumn, they collected breath from Nathusius' pipistrelles while these bats migrated from the Baltic region to the south. In the bat breath, the researchers measured the carbon stable isotope ratio. When animals oxidize exclusively fatty acids from their body reserves, breath is depleted in carbon-13 ( $^{13}\text{C}$ ). However, if animals oxidize exclusively ingested food, breath is enriched in carbon-13. The researchers found intermediate enrichments of carbon-13 in the breath of pipistrelles, and therefore concluded that bats used a combination of fat and ingested food as their fuel.

It appears as if bats use a mixed-fuel similar to the E10 gasoline recently introduced for cars. In the case of bats, a mixed fuel helps bats to save parts of their fat reserves for hibernation in Southern Europe, for example France. In contrast, migratory birds do not hibernate and therefore have to travel further south, some even to Africa, in order to avoid the harsh European winters. Hibernation in Northern Europe is not an option for migratory bats since they prefer tree roosts in which they would freeze to death during the cold northern winters.

**Voigt CC, Sörgel K, Šuba2 J, Keišs O, Pētersons G (2012): The insectivorous bat *Pipistrellus nathusii* uses a mixed-fuel strategy to power autumn migration. PROC R SOC B,1471-2954, doi: 10.1098/rspb.2012.0902.**

<http://rspb.royalsocietypublishing.org/content/early/2012/06/19/rspb.2012.0902.abstract?sid=6142f411-12eb-4ee2-9713-e1d6023fc3ab>