

## Study shows vampire bats feed group mates to ensure others will feed them later

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Common vampire bat (*Desmodus rotundus*). Credit: Wikipedia/ CC BY-SA 3.0

(Phys.org)—A pair of researchers, one with the Smithsonian Tropical Research Institute and the other the University of Maryland, has found evidence that suggests vampire bats regurgitate blood into the mouths of others in order to compel others to do the same for them when they need it. In their paper published in the journal *Proceedings of the Royal Society B*, Gerald Carter and Gerald Wilkinson describe their study involving caged vampire bats, videotaping and the ways that vampire bats share their food.

Vampire bats are social creatures—though they [feed](#) alone on the blood of other animals, they live in communities with other bats and engage in activities such as banding together to protect the young—and if a bat returns from a hunt unsuccessfully, with an empty belly, it can depend on its friends to feed it. This is important, because the bats have such a [high metabolism](#) that they can begin to starve to death after just two days if they do not find a meal. Shared feedings take the form of regurgitation, similar to the ways that mother birds feed their young. In this new study, the research pair wanted to know if the shared feeding only occurred among family members, and if such gestures were a form of reciprocal altruism—did they feed others as a general way of life, or did they only feed others because it helped ensure others would feed them when they needed it?

To find out, the researchers obtained bat donations from several zoos, allowing them to mix relatives and non-relative as is the case in a natural environment, and then videotaped bat behavior under several different scenarios—all of which were meant to ascertain the motive behind sharing.

The researchers focused only on females, because prior research has shown that sharing between females accounts for approximately 80

percent of sharing in a community. Their tests consisted of withholding food from certain females to see which others would feed them, and then later withholding food from other females to see how they would share and so on.

In looking at the tapes, the researchers found that empty-bellied bats received less donations from other bats that had been prevented from feeding them by the researchers, that there was a variance in donor contributions that appeared to be related to food received by subjects, and that bats that fed others that were not kin, received more donations outside of their family when they needed it. Taken together the data suggested that bats shared their meals in order to ensure that others would share with them.

**More information:** G. G. Carter et al. Social benefits of non-kin food sharing by female vampire bats, *Proceedings of the Royal Society B: Biological Sciences* (2015). [DOI: 10.1098/rspb.2015.2524](https://doi.org/10.1098/rspb.2015.2524)

### **Abstract**

Regurgitations of blood among vampire bats appear to benefit both direct and indirect fitness. To maximize inclusive fitness, reciprocal food sharing should occur among close kin. Why then do females with kin roost-mates help non-kin? We tested the hypothesis that helping non-kin increases a bat's success at obtaining future donations by expanding its network of potential donors. On six occasions, we individually fasted 14 adult females and measured donations from 28 possible donors. Each female was fasted before, during and after a treatment period, when we prevented donations from past donors (including 10 close relatives) by simultaneously fasting or removing them. This experiment was designed to detect partner switching and yielded three main results. First, females received less food when we prevented donations from a past donor versus a control bat. Donors within a group are therefore not interchangeable. Second, the treatment increased the variance in donors'

contributions to food received by subjects, suggesting the possibility of alternative responses to a partner's inability to reciprocate. Finally, bats that fed more non-kin in previous years had more donors and received more food during the treatment. These results indicate that a bat can expand its network of possible donors by helping non-kin.

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