**Vampire bats**

1. a. How did the investigators recognize individuals? Is there any evidence bats recognize other individual bats.

. Individuals were tagged with differently colored reflective bands on their wrists (males on the right wrist and females on the left wrist). These bands allowed the researchers to recognize individuals. The researchers tagged bats with lightweight bands of different colors. Males were tagged on their right wrist and females around their left. The tag also reflected light at low levels, allowing easier detection from the researchers. There is evidence that bats can recognize each other, and even show preference to individuals regardless of their relatedness. There was one study where two female bats spent 12 of their potentially 18 years together, certainly meaning they can recognize each other.

* 1. b. Describe the clusters within the larger bat society. I

 The clusters contain anywhere from eight to twelve adult female bats and eight to twelve pups (one for each female). The males leave the group when they reach maturity. These larger groups could be divided into smaller, varying clusters, but the larger groups do not associate with each other.

There are groups of 8-12 adult females and an equal number of pups in the group. The males defend territories and from dominant hierarchies and fight for the alpha position. The researchers found that their social organization is stable but also dynamic. The females are divided into three groups of about 12 adults and then they are subdivided into smaller groups. Each group has exclusive rights to a range of a couple trees. The researchers found that each group consists of several matrilines within which relatedness is high but between relatedness is low.

* 1. c. Who moves the most, males or females?
	2. The females move the most, they switch trees one to two times a week and occasionally switch groups. The males generally stay in one place and defend their territories from other males.
	3. d. Do individuals prefer the company of certain conspecifics? Are these always relatives?

 Females were found to prefer roosting with other females, not necessarily relatives. They live together for long periods of time and sometimes perform reciprocal altruism. Yes, individuals do prefer certain other bats and, their preference may even be for non-relatives. The preference may be due to the reciprocity theory – where individuals prefer others who reciprocate usefulness, and, even altruistic behavior Females live up to 18 years, so they have plenty of time to form bonds with non-relatives.

* 1. e. What are the ecological factors that mitigate for reciprocal altruism among non-relatives in bat societies? Or what is the cost benefit system to blood sharing?
	2. Blood sharing can occur without risk to the altruistic individual and can only benefit them later when they also might need food to prevent starvation
1. The cost-benefit system to blood sharing is that the bats generally can go 60 hours without blood, but they feed nightly. If two bats who have “buddied up” as research has found occurs, are both feeding nightly, and one cannot find a meal, the other will take care of it. This process is through ingesting regurgitated blood, which staves off starvation for 12 hours. The individual that regurgitates loses less than 12 hours of energy in the process, making it worthwhile if their roost mate is dying. Because of their history of reciprocal altruism, they “know” that it is valuable to take care of their “buddy” because if they ever need a meal their counterpart will regurgitate a meal for them. This system allows for error and gives bats that cannot feed one extra day before starvation. However, if both bats cannot find a meal the next day, they may be both imperiled, which is a risk not worthwhile to take for unassociated bats.