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# Vampire Bats on Treadmills: Unveiling Their Unique Metabolism

## Description

Recent experiments involving vampire bats running on treadmills have unveiled their intriguing method of deriving energy from proteins, a byproduct of their unique diet. Unlike most mammals, which primarily rely on fats and sugars for energy, these three species of vampire bats feast on blood, a nutrient-rich but fat- and sugar-poor sustenance. This raises questions about their metabolism, as amino acids typically contribute less than 10 percent of energy during exercise in the animal kingdom.

To delve deeper into their metabolic process, [Kenneth Welch](#) and [Giulia Rossi](#) from the University of Toronto studied 24 common vampire bats (*Desmodus rotundus*) captured in Belize. The bats were given cows' blood infused with amino acids containing labelled carbon atoms before being placed in a treadmill apparatus.

The researchers measured the bats' metabolic rates by tracking their oxygen consumption and carbon dioxide output while they ran at speeds reaching 30 metres per minute. Analysis of the carbon isotopes in the bats' exhalations revealed they were primarily sourcing energy from their recent meal, rather than from stored fats or sugars.

While most animals convert nutrients into sugars and fats for future use, vampire bats have adopted a distinct strategy that makes them particularly vulnerable to starvation—they risk depleting their energy reserves within just 24 hours of not feeding. To counter this vulnerability, these bats forge strong social bonds, often sharing meals by regurgitating blood for their companions, ensuring the survival of the group.

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## Vocabulary List:

1. **Metabolism** /mə'tæb.əl.ɪ.zəm/ (noun): The set of life-sustaining chemical reactions in organisms.
2. **Amino Acids** /ə'mi:.nɒs 'æs.ɪdz/ (noun): Organic compounds that combine to form proteins essential for various bodily functions.
3. **Sustenance** /'sʌs.tən.əns/ (noun): Food and drink regarded as a source of strength; nourishment.
4. **Vulnerability** /,vʌl.nə.rə'bɪl.ɪ.ti/ (noun): The quality of being open to harm damage or attack.
5. **Depleting** /dɪ'pli:.tɪŋ/ (verb): Reducing the amount of something leading to a shortage.
6. **Companions** /kəm'pænjənz/ (noun): Individuals with whom one shares a friendship or association.

## Comprehension Questions



### Multiple Choice

1. What do vampire bats primarily rely on for energy according to the passage?  
Option: Fats and sugars  
Option: Proteins  
Option: Carbohydrates  
Option: Vitamins
  
2. How many species of vampire bats were involved in the experiments mentioned?  
Option: One  
Option: Two  
Option: Three  
Option: Four
  
3. What method was used to track the bats' metabolic rates?  
Option: Tracking heart rate  
Option: Measuring blood glucose levels  
Option: Tracking oxygen consumption and carbon dioxide output  
Option: Weighing the bats before and after running
  
4. How do vampire bats counter their vulnerability to starvation as mentioned in the passage?  
Option: Hibernate  
Option: Store excess fats  
Option: Regurgitate and share meals  
Option: Increase their metabolic rate
  
5. What is a unique characteristic of the metabolic process of vampire bats?  
Option: High reliance on carbohydrates  
Option: Energy sourced primarily from stored fats  
Option: Depletion of energy reserves within 24 hours of not feeding  
Option: Low oxygen consumption during exercise
  
6. What do vampire bats primarily feed on?  
Option: Fruits  
Option: Fish  
Option: Blood  
Option: Insects



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### True-False

7. Vampire bats primarily rely on fats and sugars for energy.
8. Amino acids typically contribute more than 10 percent of energy during exercise in the animal kingdom.
9. Vampire bats risk depleting their energy reserves within 48 hours of not feeding.
10. Vampire bats share meals by regurgitating blood for their companions to ensure group survival.
11. Vampire bats have a low metabolic rate compared to other mammals.
12. The metabolic rates of vampire bats were measured by analyzing their blood glucose levels.

### Gap-Fill

13. Vampire bats primarily derive energy from \_\_\_\_\_ according to the experiments.
14. The researchers studied 24 common vampire bats captured in \_\_\_\_\_.
15. Analysis of the carbon isotopes in bats' exhalations revealed their source of energy was mainly their recent \_\_\_\_\_.
16. Vampire bats risk depleting their energy reserves within just \_\_\_\_\_ hours of not feeding.
17. Vampire bats forge strong social bonds and share meals by regurgitating blood for their companions to ensure \_\_\_\_\_ survival.
18. Unlike most mammals, vampire bats primarily feed on \_\_\_\_\_ as their nutrient-rich sustenance.

### Answer

**Multiple Choice:** 1. Proteins 2. Three 3. Tracking oxygen consumption and carbon dioxide output 4. Regurgitate and share meals



5. Depletion of energy reserves within 24 hours of not feeding 6. Blood

**True-False:** 7. False 8. False 9. False 10. True 11. False 12. False

**Gap-Fill:** 13. proteins 14. Belize 15. meal 16. 24 17. group 18. blood

## Vocabulary quizzes

### Multiple Choice ( Select the Correct answer for each question. )

1. Which term refers to something of considerable size or importance?

- Option: Efficiency
- Option: Substantial
- Option: Challenging
- Option: Metabolism

2. Which term means hidden or not easily noticed?

- Option: Surged
- Option: Concealed
- Option: Vulnerability
- Option: Amino Acids

3. Which term is synonymous with involved or occupied?

- Option: Separation
- Option: Engaged
- Option: Mixture
- Option: Anticipation

4. What term describes a combination of different elements?

- Option: Depleting
- Option: Culinary
- Option: Mixture
- Option: Efficiency

5. Which term describes the repulsion of water?

- Option: Metabolism
- Option: Anthology
- Option: Hydrophobic
- Option: Dynamics

6. Which term is associated with providing incentive or encouragement?

- Option: Anticipation
- Option: Vulnerability



Option: Metabolism  
Option: Motivating

7. Which term means to increase suddenly or rise rapidly?

Option: Remnants  
Option: Escapism  
Option: Surged  
Option: Speculative

8. Which term means to reduce or exhaust the supply of something?

Option: Amino Acids  
Option: Depleting  
Option: Culinary  
Option: Highlight

9. Which term is related to cooking or the art of preparing food?

Option: Separation  
Option: Efficiency  
Option: Culinary  
Option: Vulnerability

10. Which term describes the ability to accomplish a task with minimal waste of time and effort?

Option: Speculative  
Option: Efficiency  
Option: Anticipation  
Option: Metabolism

**Gap-Fill ( Fill in the blanks with the correct word from the vocabulary list. )**

11. A \_\_\_\_\_ is an observable fact or event.

12. The child's illness left him with a sense of \_\_\_\_\_.

13. After the fire only a few \_\_\_\_\_ of the building stood.

14. The library features an \_\_\_\_\_ of short stories by various authors.

15. The students waited in \_\_\_\_\_ for the exam results.

16. Investing in cryptocurrency can be highly risky and \_\_\_\_\_



17. Your body's \_\_\_\_\_ affects how efficiently you burn calories.
18. The journey was made easier by the presence of loyal \_\_\_\_\_.
19. The trip's \_\_\_\_\_ was seeing the majestic waterfall.
20. The final exam was extremely \_\_\_\_\_.

**Matching Sentences ( Match each definition to the correct word from the vocabulary list. )**

21. The artist created intricate designs in her work.
22. Understanding the _____ of a new team can help improve collaboration.
23. Their relationship was amicable and they remained friends.
24. In harsh conditions finding _____ can be a struggle.
25. The coach gave a speech that inspired the team.
26. Improving in production can lead to cost savings.
27. The chef's skills impressed all the guests.
28. The professor published an _____ of poetry by modern writers.
29. The novel offered readers a form of _____ from their daily lives.
30. The movie's _____ was the stunning visual effects.

## Answer

**Multiple Choice:** 1. Substantial 2. Concealed 3. Engaged 4. Mixture 5. Hydrophobic 6. Motivating 7. Surged 8. Depleting 9. Culinary 10. Efficiency

**Gap-Fill:** 11. phenomenon 12. vulnerability 13. remnants 14. anthology 15. anticipation 16. speculative 17. metabolism 18. companions 19. highlight 20. challenging

**Matching sentence:** 1. meticulously 2. dynamics 3. separation 4. sustenance 5. motivating 6. efficiency 7. culinary 8. anthology 9. escapism 10. highlight

## CATEGORY

1. Sci/Tech - LEVEL4



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**Date Created**

2024/11/06

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