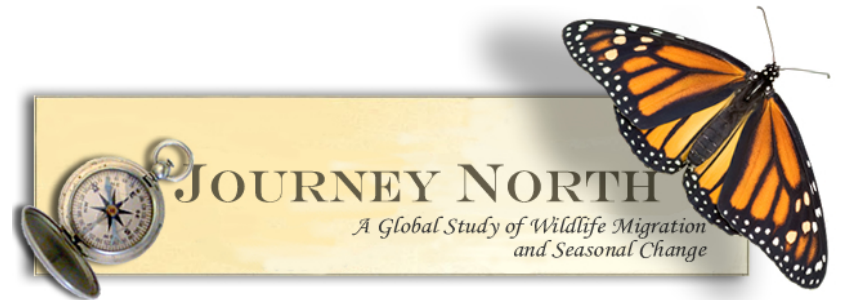




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## **No Food for Five Months?** Surviving the Winter on Stored Energy



Photo ©Lincoln Brower, Sweet Briar College

by Elizabeth Howard

## No Food for Five Months?

Monarch butterflies arrive in Mexico in November and stay until March. Scientists say they can survive all winter with little or no food at all. How is this possible? Where do monarchs get the energy they need to survive? Let's explore!



Dr. Lincoln Brower

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## Voracious Eating as a Caterpillar

Monarch butterflies must survive on the food they ate *before* they went to Mexico for the winter. When a monarch caterpillar eats milkweed, some is stored as fat. A monarch caterpillar that finds plenty of milkweed becomes a big, healthy butterfly with a reserve of fat. This helps a monarch survive the winter.



2



## Voracious Eating as an Adult

Adult monarch butterflies drink nectar from flowers. Extra food is stored as fat in the monarch's abdomen. Monarchs eat hungrily in the fall before—and during—their migration.

"They're so intent on eating in the fall you can sneak up on them and catch them with your fingers!" observed Dr. Brower. "Monarchs won't let you do that any other time of year."



## How Do Cool Temperatures Help?

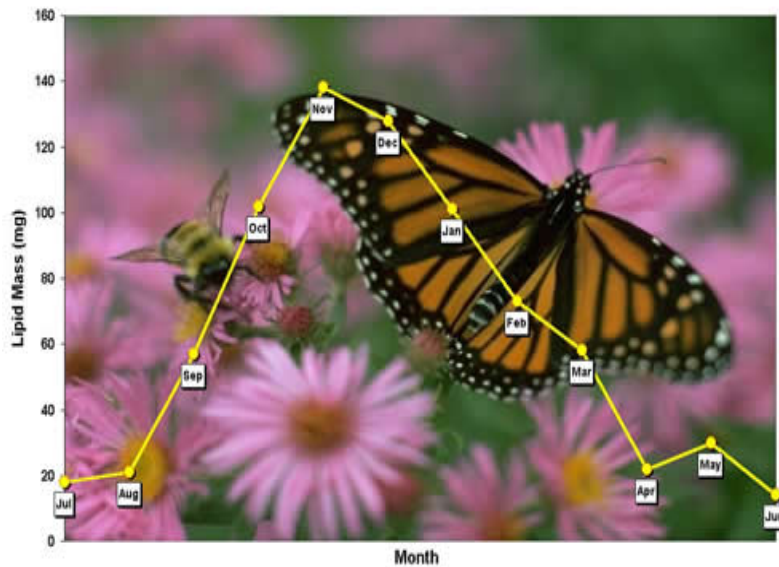
The secret behind the monarch's survival without food is the cool habitat it chooses in Mexico.

"Cool temperatures in the forest slow down the monarchs' metabolism so they can stay alive longer," says Dr. Karen Oberhauser.



## Fat Reserves Month-by-Month

This graph shows how much fat the typical monarch has in each month of the year. How do fat reserves change during the five months the monarchs are in Mexico?



5

## Fat is Fit

When butterflies arrive in Mexico, some are big, fat and fresh. Others are already thin, tattered, and torn. Look at the size of each butterfly's abdomen, where its fat is stored. Running out of fat is a common cause of death. Which of these two butterflies do you think is more likely to survive the winter?



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## So Many Butterflies, So Few Flowers!

Imagine how many flowers millions of hungry monarchs would need. There can be 50 million monarchs sharing a single hectare.

"There are some flowers near the colonies, but nowhere near enough for all of the butterflies," says Dr. Oberhauser.



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## What About Water?

Monarchs do need water to survive the winter and often leave their clusters to find it. On warm days, they fly out of the colonies by the millions to drink. At first, scientists didn't realize water was so important. Now they know that protecting the watershed of the forest is one of the most important conservation goals.



## A Puzzling Observation

People often see monarchs drinking nectar from flowers at the sanctuaries in Mexico. Observations like this intrigue scientists. Read what they have to say about this question:

Is *Some* Nectar Important to *Some* Monarchs During the Winter?

<http://www.learner.org/jnorth/tm/monarch/WinterFoodBrower.html>



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