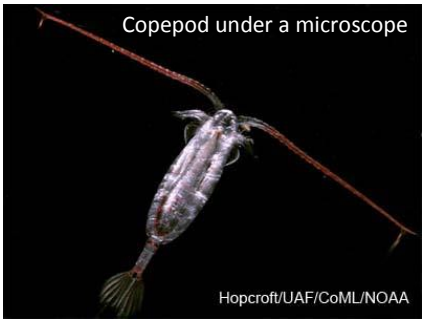
How Does Whale Blubber Work?

Background

Whales are warm-blooded mammals that can survive in water temperatures as frigid as the low 40 degrees Fahrenheit. How do they manage to stay warm, even in the ice-cold waters of the Atlantic? By wearing a thick layer of fat, called **blubber**, just beneath the skin!

Whales acquire this fat layer by consuming high-calorie food. As a mammal, a baby right whale may drink up to **58 gallons daily** of their mother's milk, which has such a high fat content that it has the consistency of soft margarine! An adult North Atlantic right whale, on the other hand, may eat **2,000 pounds of nutrient-rich copepods** each day. All of this intake is necessary to not only provide the energy they need to swim great distances and dive to incredible depths, but to help maintain an essential layer of fatty insulation.



Activity Objective

To make a **"blubber glove"** which simulates the whale's layer of insulating fat, known as blubber. We'll conduct a simple experiment to test the effectiveness of fat as an insulator.

Materials

- Two Ziploc bags, either quart or sandwich size
- Can of shortening
- Spoon
- A bucket or large bowl filled with ice water
- Timer
- Optional: Duct tape

Note: An instructional video for making a blubber glove can be found here.

Audubon Society of Rhode Island

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NARWC The North Atlantic Right Whale Consortium

WDC Whale and Dolphin Conservation

Activity

1. Use a spoon to fill a Ziploc bag with about six inches of shortening.
2. Create your "blubber glove" by placing a second bag inside the first bag and use it to mush the shortening around the bottom half of the bag. You may choose to tape the top edges of the two bags together to ensure no shortening spills out during the activity.
3. Place a hand in the ice water, using another Ziploc bag if you prefer to keep your hand dry. Use a timer to see how long you can safely withstand the cold. Make note of this time.
4. Next, place your "blubber glove" in the container of ice water.
5. Place a hand in the "blubber glove" and use the timer to see how long your hand can stay in the ice water now that it is insulated.

Wrap Up

Compare the two times for each of your dip tests. What benefit did you notice by using the "blubber glove"?

Would a thick layer of this fat allow you to live in a colder climate? Why or why not?

Can you think of any man-made materials that humans can use to keep themselves warm in water?

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