**How Much Does a Whale Really Eat?**

**Teacher Instructions**

**Objective**

Students will calculate feeding rates of whales and compare them to feeding rates in humans. This is a math intensive exercise.

**Materials and Supplies**

Worksheet for students

**Background**

Whales are very large animals, and sometimes it is hard to believe how much they have to eat. The largest whales are the blue whales (*Balaenoptera musculus*) which can grow to 100 feet and 100 tons while eating krill which are only 2 cm long and weigh next to nothing. How do blue whales survive? Krill in upwelling regions such as the Gulf of the Farallones are very abundant, energy rich, and very easy to catch. Baleen whales feed during the summer in areas with very high concentrations of plankton and small fish.

Students will calculate how much a whale eats and compare it to how much they eat. A typical human weighs 150 lbs and consumes 2,000 calories per day. A typical whale weighs 50 tons and needs nearly 400,000 calories per day. A whale may spend 15 hours per day feeding during the summer season.

**Activity**

**Questions and answers.**

1. A blue whale is about 90,000 kg (198,000 lbs) and it eats about 4% of its body weight per day during the feeding season. How much does it eat per day?

**90000 kg X 4% = 3600 kg**

2. A blue whale can fill its stomach to about 1,000 kg (2,200 lbs). How many times does a blue whale fill up its stomach each day?

**3600 kg / 1000 kg = 3.6**

3. Blue whales feed for about 120 days during the feeding season each year. How much does a blue whale eat each year?

**3600 kg/day X 120 days/year = 432,000 kg/year**

4. Krill have a caloric value of about 6 calories per gram. How many calories does a blue whale eat each year?

**432,000 kg/year X 6 calories/g X 1000 g/kg = 2,592,000,000 calories per year.**

A whale spends about 15 hours per day feeding during the summer season. How many calories does it consume per minute during feeding?

**3600 kg/day X 6 calories/g X 1000 g/kg = 24,000 calories per minute**

**(15 hours/day X 60 minutes/hour)**

5. Investigate your own consumption rates.

* How many minutes do you spend feeding per day?

**60 minutes**

* How many calories do you eat per day?

**2000 calories**

* Calculate the number of calories you consume per minute during feeding?

**2000 calories / 60 minutes = 33.3 calories per minute**

* Calculate the number of calories you consume per year?

**2000 calories/day X 365 day/year = 730,000 calories per year**

* If you eat food with a caloric value of 0.25 g per calorie, how many grams of food do you eat each day?

**0.25 g/calorie X 2000 calories/day = 500 g/day**

6. Compare your caloric intake with that of a whale. What factors account for the difference in caloric intake? How does food availability differ for humans and whales?

**Credits**

The idea for this activity came from Neptune’s Web (pao.cnmoc.navy.mil/educate/neptune).

Evans, P. G. H. 1987. The Natural History of Whales & Dolphins. Facts on File Publications. New York.

**How Much Does a Whale Really Eat?**

**Student Worksheet**

1. A blue whale is about 90,000 kg (198,000 lbs) and it eats about 4% of its body weight per day during the feeding season. How much does it eat per day?
2. A blue whale can fill its stomach to about 1,000 kg (2,200 lbs). How many times does a blue whale fill up its stomach each day?
3. Blue whales feed for about 120 days during the feeding season each year. How much does a blue whale eat each year?
4. Krill have a caloric value of about 6 calories per gram. How many calories does a blue whale eat each year?
5. A whale spends about 15 hours per day feeding during the summer season. How many calories does it consume per minute during feeding?

6. Investigate your own consumption rates.

* How many minutes a day do you spending feeding?
* How many calories do you eat per day?
* Calculate the number of calories you consume per minute during feeding?
* Calculate the number of calories you consume per year?
* If you eat food with a caloric value of 0.25 g per calorie, how many grams of food do you eat each day?

7. Compare your caloric intake with that of a whale. What factors account for the difference in caloric intake? How does food availability differ for humans and whales?