

## Baby Whale Formula

### OBJECTIVES

Students gain practice measuring and making calculations.

### BACKGROUND

On January 11, 1997, an orphaned gray whale calf stranded on a beach near Los Angeles, California. The SeaWorld Animal Rescue and Rehabilitation Team began preparations to treat the newborn gray whale, who came to be known as J.J.

Park veterinarians immediately administered fluids, glucose, and antibiotics. A whale milk substitute was developed by park marine mammal experts. At first, J.J. was fed every three hours, around the clock. While one group of animal care specialists created the formula critical for the calf's nutritional needs, another group donned wet suits and climbed into the pool with the whale.

At first, J.J. was fed about 6 liters of formula every three hours. Over time, her food intake increased. Before she was weaned, J.J.'s daily food intake consisted of six 20-liter feedings.

About 14 months after her arrival, a healthy J.J. – by then 8,700 kilograms and 9.4 meters long – was released into the Pacific Ocean off San Diego.

In this activity, students measure ingredients to create a mock whale formula. Substitute bananas for the herring, dry milk for the Zoologic® powder, chocolate drink powder for the dicalcium phosphate, and cinnamon for the lecithin.

### MATERIALS

- bananas
- nonfat dry milk
- milk or heavy whipping cream
- sugar
- table salt
- cinnamon
- chocolate drink powder
- blender
- small cups (one for each student)
- overhead transparency of "J.J.'s Formula" on page 13 (enlarge 200%)
- overhead marking pen or grease pencil
- scales for measuring in grams
- graduated cylinder for measuring in milliliters



SeaWorld animal care specialists poured formula into a funnel attached to a tube that went into J.J.'s mouth.



## ACTION

1. Gather the materials for each cooperative learning group.
2. Discuss J.J.'s rescue and rehabilitation at SeaWorld with your students.
3. Display the overhead transparency of J.J.'s formula. Tell students that they will make a batch of J.J.'s formula.

<b>J.J.'s Formula</b>	
<i>(amounts listed per liter of formula)</i>	
230 g	ground herring (heads removed)
70 g	Zoologic® Milk Matrix Powder (artificial milk replacer powder)
50 ml	heavy whipping cream
7.5 g	glucose
4.5 g	NaCl
3.5 g	lecithin
125 mg	taurine
18.75 g	dicalcium phosphate
<small>(Zoologic® is a product of Pet-Ag, Inc., 201 Keyes Ave., Hampshire, IL, 60140)</small>	

4. Inform students that they will be making a few substitutions in the ingredients list. For each of the following substitutions, mark the corresponding change on your overhead transparency.
  - bananas (peels removed) instead of herring (heads removed)
  - nonfat dry milk instead of Zoologic® powder
  - milk instead of heavy whipping cream (substitution optional)
  - table sugar instead of *glucose*
  - cinnamon instead of lecithin
  - chocolate drink powder instead of dicalcium phosphate
5. Your formula will be for humans, so you will omit the taurine. Taurine is an amino acid in whale milk that seems to be absent in the milk of other species. NaCl is table salt.
6. Assist students as they weigh and measure ingredients and supervise the preparation of the formula in a blender. Students sample the formula they make.
7. Within a week of J.J.'s arrival she was drinking seven 7.6-liter feedings of the formula daily. Have students calculate how many liters per day J.J. was ingesting at this point. J.J.'s formula contained 1.08 *kilocalories* per milliliter. How many kilocalories were in one liter of J.J.'s formula? How many kilocalories per day was J.J. ingesting when she first arrived?
8. Before J.J. was weaned onto solid food she was drinking six 20-liter feedings of formula daily. Have students calculate how many liters per day she was drinking at this point. How many kilocalories was she ingesting?

## ANSWERS

6.  $7 \times 7.6 \text{ liters} = 53.2 \text{ liters per day}$   
 $1.08 \text{ kilocalories per ml}$   
 $= 1,080 \text{ kilocalories per liter}$   
 $1,080 \text{ kilocalories per liter} \times 53.2 \text{ liters}$   
 $= 57,456 \text{ kilocalories per day}$
7.  $6 \times 20 = 120 \text{ liters per day}$   
 $1,080 \text{ kilocalories/liter} \times 120 \text{ liters}$   
 $= 129,600 \text{ kilocalories per day}$