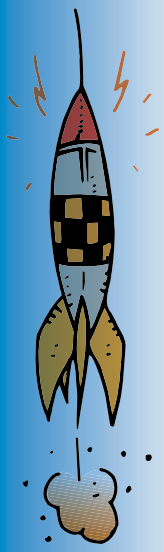
Volume 4
Issue 2



Space Nutrition

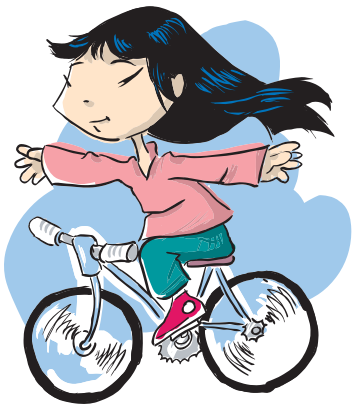
Energy - A Balancing Act

Introducing the Space Nutrition Crew!

Lin Tim Thea Diego

Our crew will guide us through future issues, and they will help show how much fun nutrition and biochemistry can be! They will be our "mascot" - a person, animal, or object that represents an organization.

Energy is what keeps us going. Every cell in your body needs energy to function properly. The food you eat provides energy, which is measured in calories. Balancing energy from foods you eat with the energy your body uses each day is important for good nutrition. Eating enough calories makes sure you are alert and able to do your schoolwork. Without enough calories, you will be tired and your muscles will not work well. However, too many calories can also be bad for your overall health. Balancing exercise and good nutrition is key to your overall health.



A healthy diet should include the right number of calories. In addition to the total number of calories, the source (or type) of calories is important. For a healthy diet, calories should come from the following sources: 50-60% from carbohydrate, 30% from fat, and 10-15% from protein.

Food labels are a great place to learn about your favorite food. First, check the serving size and how many servings are in that package. Next, look at how many calories are in each serving, and what percentage of the calories come from fat, carbohydrate or protein. For more information on the number of servings of foods you need each day, check out the Food Guide Pyramid.

Thea's Corner...

Astronauts need to eat just as much food in space as they do on Earth, and math can be used to calculate exactly how many calories they need. To find out how much food astronauts should consume in one day during space flight, we need to know their weight, height, and age. From this information, we can estimate their energy needs. Just as your height is measured in feet or inches, energy is measured in calories or kilocalories (kcals). Here are two equations used to calculate energy needs for either males or females:

For males, total energy needs (in kcals) =
$[66.5 + (13.8 \times W) + (5 \times H) - (6.8 \times A)] \times 1.6$

For females, total energy needs =
$[655.1 + (9.6 \times W) + (1.9 \times H) - (4.7 \times A)] \times 1.6$

where W = your weight in kilograms (1 kilogram = 2.2 pounds)
H = your height in centimeters (1 inch = 2.54 centimeters)
A = your age in years

Did you know?

- Fat has more than twice as many calories, per unit weight, as carbohydrate and protein.
- In October 2004, the Expedition 10 crew will launch to the International Space Station, and the Expedition 9 crew will return to Earth.
- Two new planets have been found outside of our solar system. They are about the size of the planet Neptune.
- A kilocalorie is equal to 1000 calories.

The Challenge:

Let's pretend that you are in charge of an astronaut's nutritional needs for a day.

1. Write the equation you would use to calculate the total energy needs for a male astronaut who is 35 years old, weighs 180 pounds, and is 72 inches tall. What are his total energy needs (in kcals)?

   _____

2. What are YOUR total energy needs?

   _____

Are you up for another challenge? Check out our website at the bottom of this page for more math problems relating to this topic.

Word of the Month

deficient

Can you guess what this word means? Look it up in the dictionary and see if you were right. We'll have more on this next month!

Web Challenge: See if you can find out why people often call the moon "blue". Check out the links below!

Read about food labels, serving sizes, Food Guide Pyramid, and new planets at the following links:

http://planetquest.jpl.nasa.gov
http://www.fda.gov/oc/opacom/kids/default.htm
http://www.nasa.gov/audience/forkids/home/index.html
http://www.fns.usda.gov/tn/Educators/yrslf06.pdf

Check out the Nutritional Biochemistry Laboratory's Web site for more information about nutrition and space:

http://haco.jsc.nasa.gov/biomedical/nutrition/