



## Energy & Food

Remember to practice with the study questions on the BIOL 101 web site.

Aerobic respiration	Energy
Alcohol	Enzyme
Anaerobic respiration	Fermentation
Atom	Kilocalorie
ATP	Light reaction
Calorie	Methane
Carbohydrate	Molecule
Chlorophyll	Oxidation
CO <sub>2</sub> fixation	Photosynthesis
Conservation of Energy	Pyruvic acid
Dark reaction	Respiration

Nutrition Facts	
Serving size: 119 g Servings per container: 1	
Amount Per Serving	
Calories 470	Cal. from fat 180
% Daily Value *	
<b>Total Fat</b> 20 g	31%
Saturated Fat 4.5 g	22%
Trans Fat 4.5 g	10%
<b>Cholesterol</b> 30 mg	21%
Sodium 510 mg	23%
<b>Total Carbohydrate</b> 68 g	
Dietary Fiber <1 g	4%
Sugars 44 g	8%
<b>Protein</b> 4 g	
Vitamin A 0%	Vitamin C 0%
Calcium 2%	Iron 8%
*Percent Daily Values is based on a 2,000 Calories diet. Your daily values may be higher or lower depending on your caloric needs.	
Calories per gram Fat 9 • Carbohydrate 4 • Protein 4	

### Questions:

1. One-tenth of a Life Saver<sup>®</sup> was burned in a calorimeter to raise the temperature of 100 gm of water 10°C. Calculate the number of calories in the Life Saver<sup>®</sup>.
2. Differentiate between the following pairs:
  - fermentation and respiration
  - aerobic respiration and anaerobic respiration
3. Trace the flow of energy from sunlight through consumers to microorganisms.
4. How does ATP store and release energy? Should you be taking ATP pills?
5. The nutrition label is from a vending machine snack. Is this a good snack?

# Menu à la BIOL 101



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Macromolecule	Enzyme	Product	Location	To blood as	Use
Carbohydrates Starch					
Lactose					
Lipids					
Protein					

Nutrition Facts	
Serving Size 1 piece (17 g)	
Servings Per Container about 35	
Amount Per Serving	
<b>Calories 90</b> Calories from Fat	
	% Daily Value*
<b>Total Fat</b> 5 g	%
Saturated Fat 3.5 g	%
Trans Fat 0 g	%
<b>Cholesterol</b> < 5 mg	%
<b>Sodium</b> 15 mg	%
<b>Total Carbohydrate</b> 10 g	%
Dietary Fiber 0 g	0%
Sugars 9 g	%
<b>Protein</b> 1 g	%
Vitamin A 0%	• Vitamin C 0%
Calcium 2%	• Iron 0%
*Percent Daily Values are based on a diet of 2,000 calories. Your daily values may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2400mg 2400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g

- How many calories in 1 serving?
- What is a calorie?
- What nutrients are inorganic elements?
- Why do you need them?
- What nutrients are organic growth factors?
- Why do you need them?

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<b>Total Carbohydrate</b> 10 g	%
Dietary Fiber 0 g	0%
Sugars 9 g	%
<b>Protein</b> 1 g	%
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- Which nutrients are organic molecules that provide your macronutrients (\_\_\_\_\_)?
- Which nutrients provide calories for a human?

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- What are carbohydrates?
- Why do you need them?
- What percentage of the calories are from carbohydrates?
- What percentage of your daily requirement is this?

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Dietary Fiber 0 g	0%
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- What percentage of the calories are from proteins?
- Why do you need proteins?

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Saturated Fat 3.5 g	%
Trans Fat 0 g	
<b>Cholesterol</b> < 5 mg	%
<b>Sodium</b> 15 mg	%
<b>Total Carbohydrate</b> 10 g	%
Dietary Fiber 0 g	0%
Sugars 9 g	
<b>Protein</b> 1 g	
Vitamin A 0%	Vitamin C 0%
Calcium 2%	Iron 0%

- What percentage of the calories are from fats?
- Why do you need fats?

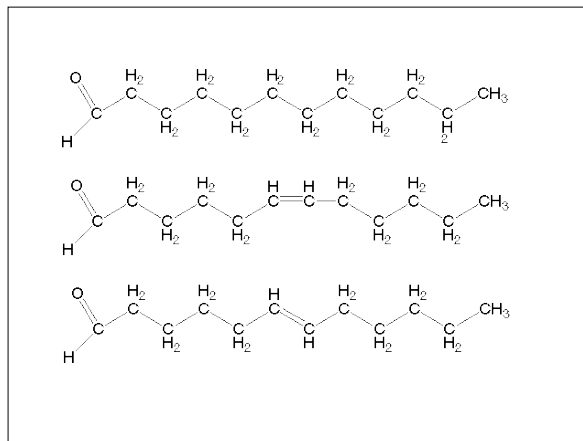
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You should have <20 g sat fat/day.

What percentage is this?

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- You should have <65 g fat/day.
- What percentage of your daily total fat is provided by one serving?



**Label the following:**

- Carbon dioxide
- Dark reaction of photosynthesis
- Fermentation
- Glucose
- Glycolysis
- Lactic acid
- Light reaction of photosynthesis
- Pyruvic acid
- Respiration

**To do:**

- Color the Chlorophyll green.
- Color the Carbon atoms in Carbon dioxide, use the same color to color those carbon atoms as they proceed through metabolism.
- Color the Hydrogen atoms in Water, use the same color to color those hydrogen atoms as they proceed through metabolism.
- Color the Oxygen atoms in Water. Use the same color to identify those oxygen atoms in their products.
- Both the light reaction of photosynthesis and respiration use the electrons from Hydrogen atoms in an electron transport chain. Color the electrons.

Show where ATP is made.

Show where ATP is used.

Show how an alcoholic fermentation differs from the metabolic pathway shown here?

Identify the pathways that occur in humans.

Identify the pathways that occur in plants.

