Name: _____ Date: _____

C

How May I Take Your Order?

Have you ever looked a nutrition label? What type of information can you find? Does this information mean anything to you? Why do you think nutrition labels exist?

Food regulation has been known to occur as early as the 13th century when the King of England prohibited bread makers from adding ground peas into the dough. In America, it began as early as colonization; years later President Lincoln launched the Department of Agriculture and Bureau of Chemistry (which we know now as the F.D.A., Food and Drug Administration).

In 1990, the *Nutrition Labeling and Education Act (NLEA)* was passed. This act requires all packaged foods to have nutrition labeling and all health claims for foods to be consistent with certain terms defined by the Secretary of Health and Human Services. The food ingredient panel, serving sizes, and terms such as "low fat" and "light" are standardized. This has evolved into the nutrition label as we know it today.

Just a year later in 1991, nutrition facts, which include basic per-serving nutritional information, are required on foods under the Nutrition Labeling and Education Act of 1990. Food labels are to list the most important nutrients in an easy-to-follow format.

1. Describe one of the earliest recorded food regulations: _____
_____
_____.

2. Which two federal agencies did President Lincoln introduce?
_____
_____.

3. What does the NLEA stand for? When was it passed, and how does it affect consumers? _____
_____
_____
_____.

The three main items you will see listed on nutrition labels are **fats, carbohydrates,** and **proteins.** Each of these is different in structure and function, but they are similar in one way, that your body needs them to survive.

Fats

Our body needs fat for many things, including heat and padding to help protect our vital organs. But fat is also important for things on a more microscopic scale such as

endocrine function and absorption of essential vitamins. Fat is made up of triglycerides and fatty acid chains, which are comprised of **carbon, hydrogen** and **oxygen**.

Fats can be **saturated** or **unsaturated**. Saturated fats are solid at room temperature, and have as many hydrogen atoms as they can carry (in other words they are "saturated" with hydrogen atoms). Examples of saturated fats are fats found in butter, animal fat, ice cream, and whole milk.

Unsaturated fats have less hydrogen atoms in their structure than saturated fats. This is because some of the carbon atoms in their structure create double bonds. Unsaturated fats are liquid at room temperature. Examples include most vegetable oils, fish oil, and most fats found in nuts. There are two categories of unsaturated fats: **monounsaturated** and **polyunsaturated**. The structural difference is that monounsaturated fats have one double bond between carbon atoms, and polyunsaturated fats have more than one double bond. Typically, unsaturated fats are best for your health because they actually improve good cholesterol and decrease bad cholesterol.

Though your body does need fat to survive, having too much fat in your diet poses many health threats, including high cholesterol, which can lead to stroke and heart attack. The cholesterol can build up in your arteries and eventually clog them, causing blood flow to significantly slow down to the brain and other parts of the body.

4. Why does the body need fats? _____
_____
_____
_____.

5. Which three types of elements make up fats? _____
_____.

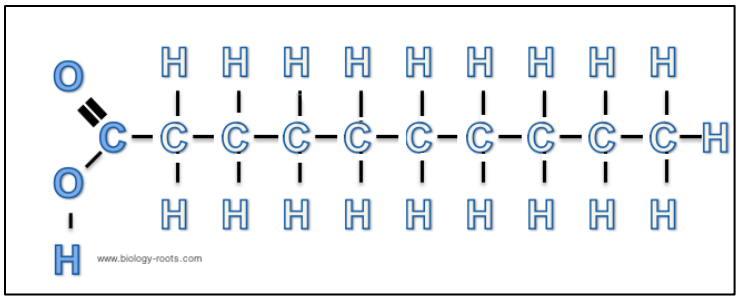
6. Give four examples of saturated fats: _____
_____.

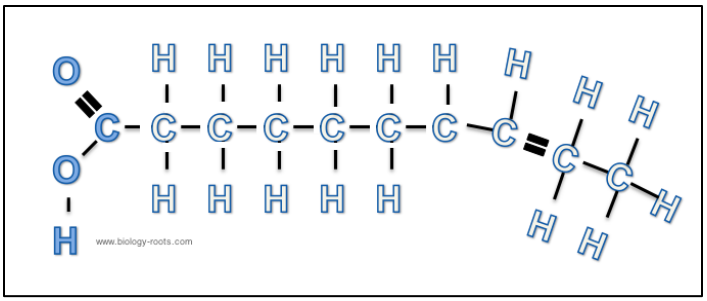
7. Give two examples of unsaturated fats: _____
_____.

8. What is the difference between monounsaturated fats and polyunsaturated fats?
_____
_____.

9. Explain what could happen to your body if you consumed too much fat.
_____
_____
_____
_____.

10. For each picture below, label it as “saturated fat” or “unsaturated fat” in the line provided.





_____ _____

11. Is the unsaturated fat pictured monounsaturated or polyunsaturated? _____

Carbohydrates

Carbohydrates (or “carbs”) are also composed of carbon, oxygen and hydrogen atoms, but they are very different in design and function compared to fats. Carbohydrates are what the body uses first for energy. Examples of carbohydrates included glucose, fructose, sucrose, and starches. Carbohydrates are **sugars**. Carbohydrates cannot be stored for very long, and are converted into glycogen in the liver. Any excess glycogen is stored as fat. You may have heard of “blood sugar”, this refers to your glucose levels. Your brain cannot use fat as energy directly; it needs glucose- hence why when your blood sugar is low, you tend to feel dizzy and unable to concentrate. But, don’t worry- your body has a way to convert fats into a usable form for the brain as a last resort. Carbohydrates are also required for cell function among all living things.

Carbohydrates are found in many things. Plants use them for structural support in a form called **cellulose**. Cellulose appears on nutrition labels as **“fiber”**. We are not able to digest cellulose, but it aids in smooth digestion of the intestines.

12. Give 3 examples of carbohydrates listed in the reading:
_____

13. What does the liver convert excess carbohydrates into? _____

14. Explain why low blood sugar leaves you feeling dizzy: _____
_____
_____.

15. What is cellulose? _____

The theory behind the Atkins diet is that by eliminating carbs completely, your body will directly use stored fats, thus a quicker way to burn excess fat. This theory has not been proven, as there are many factors involved, and the body is a very complex machine.

Proteins

Proteins are not particularly useful for energy- but our bodies do need them to build and repair muscle tissue. Proteins are broken down into smaller molecules called amino acids. Our bodies do not have a way to store proteins, they just sort of hang around until they are needed. Foods that are highest in proteins include meats, eggs, nuts, cheese, yogurt, and other types of dairy. Proteins are also important for cell function.

16. Name 2 reasons our bodies require proteins: _____
_____.

17. Name 4 types of foods high in protein. _____
_____.

Calories

Most of us think of calories as being related to food, but calories can be found in just about anything containing energy. As we know our body needs to energy to survive- it needs energy to do anything at all! Let's say your breakfast this morning was 250 calories, your body takes these calories and breaks them down through metabolic processes. These metabolic processes break down the carbohydrates, fats, and proteins and send them through the blood stream to cells, or continue on with the metabolic process to react with oxygen to release energy.
To simplify things, Carbohydrates, Fats, and Protein, are the actual energy when broken down by our body. Every carbohydrate, fat and protein has its own amount of energy, or calories. See the table below:

Type of organic molecule	**Amount of calories per gram**
Fat	9
Carbohydrates	4
Protein	4

Example) If you ate a meal that had **4g of fat, 16g of Carbs, and 11g of protein**, it would **be 144 calories** (**4**g Fat x **9**cal/g=**36 + 16**g Carbs **x 4**cal per g= **64** calories + calories + **11**g Protein x **4**cal/g= **44** calories; **36 + 64 + 44 calories= 144 calories**).

	Number of grams	Multiply # of grams by…	Total
Fats	4	9	36
Carbs	16	4	64
Protein	11	4	44
		Total calories:	144

Use the information above to help you fill in the tables below:

18.	Number of grams	Multiply # of grams by…	Total
Fats	14	9	
Carbs	22	4	
Protein	10	4	
		Total calories:	

Try this one…solve for the grams of carbs.

19.	Number of grams	Multiply # of grams by…	Total
Fats	8	9	
Carbs	?	4	
Protein	19	4	
		Total calories:	**220**

Reading a Nutrition Label- When reading a nutrition label, there are some key factors you want to look out for**: serving size (as well as serving size per container) calories, total fat, carbohydrates, and proteins, and percent daily value.**

Nutrition Facts

Serving Size 1/2 cup (115g)
Servings Per Container About 4

Amount Per Serving

Calories 250	**Calories from Fat** 130
	% Daily Value*
Total Fat 14g	**22%**
Saturated Fat 9g	**45%**
Cholesterol 55mg	**18%**
Sodium 75mg	**3%**
Total Carbohydrate 26g	**9%**
Dietary Fiber 0g	**0%**
Sugars 26g	
Protein 4g	
Vitamin A 10%	Vitamin C 0%
Calcium 10%	Iron 0%

* Percent Daily Values are based on a 2,000 calorie diet.

20. How many TOTAL calories are in this particular food? (Hint: multiply calories by total servings per container):

_____

21. Is this nutrition label for a fruit or vegetable, or any type of plant? How do you know? _____

_____

_____.

22. Notice that decimals are not used on nutrition labels. **The total number of Calories from Fat is listed as 130.** You know how the total fat calories are calculated. Review the nutrition label. Is the **Total Fat** listed higher, lower, or the same as the actual total fat, based on the total *calories* from fat?

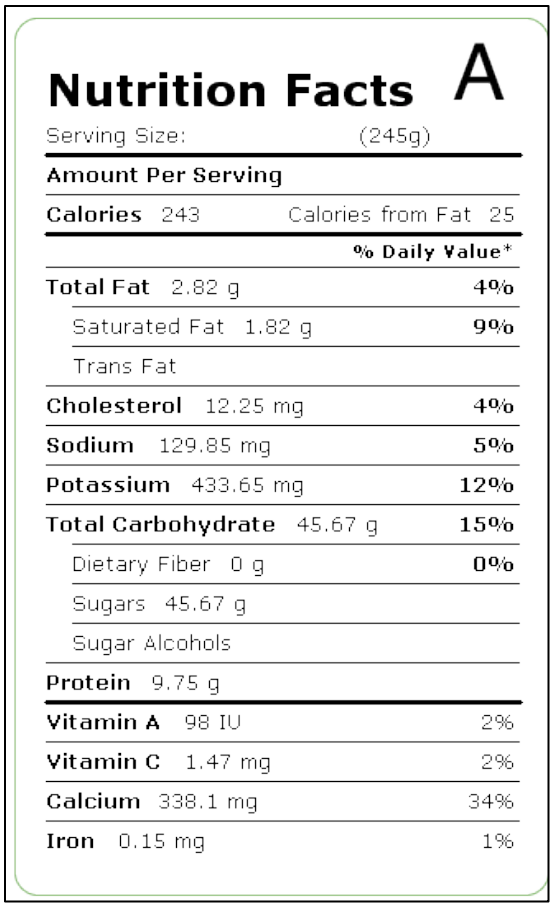
_____

_____

_____.

MATCHING GAME Try to match the nutrition labels pictured with the following by matching the letters to each numbered term.

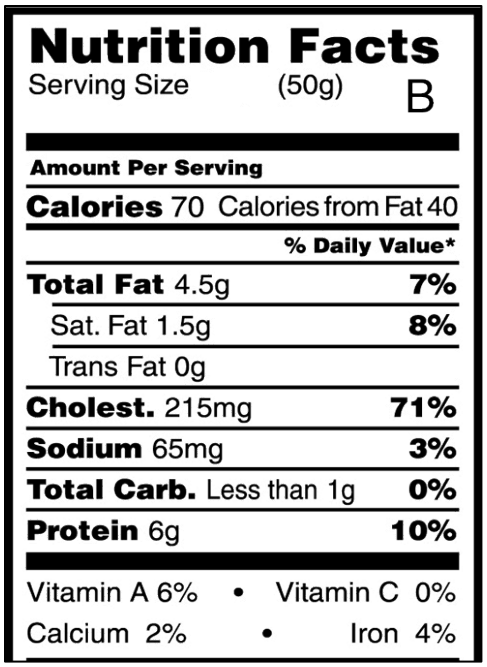
1) _____ 1 egg 2) _____ 1 Big Mac® 3) ____ 1 tomato 4) _____ 1 cup nonfat yogurt



Nutrition Facts A

Serving Size: (245g)

Amount Per Serving	
Calories 243	Calories from Fat 25
	% Daily Value*
Total Fat 2.82 g	**4%**
Saturated Fat 1.82 g	**9%**
Trans Fat	
Cholesterol 12.25 mg	**4%**
Sodium 129.85 mg	**5%**
Potassium 433.65 mg	**12%**
Total Carbohydrate 45.67 g	**15%**
Dietary Fiber 0 g	**0%**
Sugars 45.67 g	
Sugar Alcohols	
Protein 9.75 g	
Vitamin A 98 IU	2%
Vitamin C 1.47 mg	2%
Calcium 338.1 mg	34%
Iron 0.15 mg	1%



Nutrition Facts

Serving Size (50g) B

Amount Per Serving	
Calories 70	Calories from Fat 40
	% Daily Value*
Total Fat 4.5g	**7%**
Sat. Fat 1.5g	**8%**
Trans Fat 0g	
Cholest. 215mg	**71%**
Sodium 65mg	**3%**
Total Carb. Less than 1g	**0%**
Protein 6g	**10%**

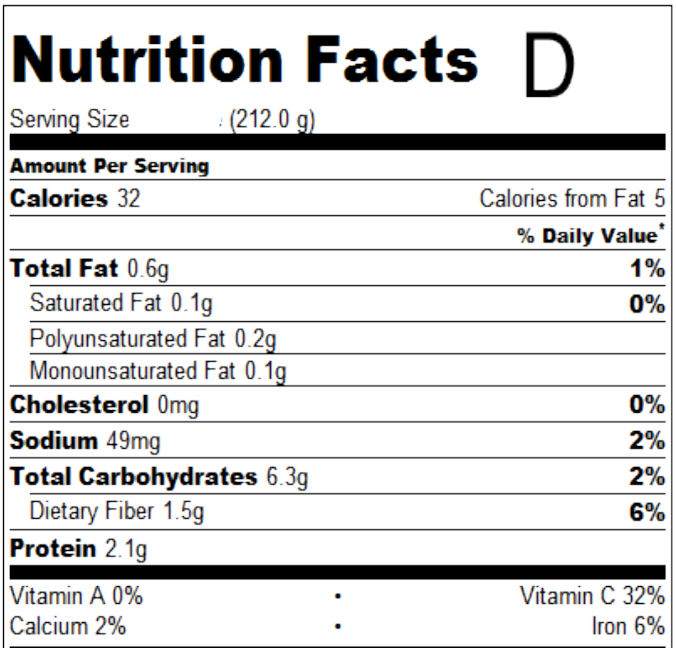
Vitamin A 6% • Vitamin C 0%

Calcium 2% • Iron 4%

Nutrition Facts C

Serving Size 1 serving (219g)

Amount Per Serving			
Calories 572	Calories from Fat 278		
	% Daily Value*		
Total Fat 31g	48%		
Saturated Fat 11g	55%		
Cholesterol 79mg	26%		
Sodium 1062mg	44%		
Total Carbohydrate 47g	16%		
Dietary Fiber 3g	12%		
Sugars			
Protein 26g			
Vitamin A	0%	• Vitamin C	1%
Calcium	28%	• Iron	17%



Nutrition Facts D

Serving Size (212.0 g)

Amount Per Serving			
Calories 32	Calories from Fat 5		
	% Daily Value*		
Total Fat 0.6g	**1%**		
Saturated Fat 0.1g	**0%**		
Polyunsaturated Fat 0.2g			
Monounsaturated Fat 0.1g			
Cholesterol 0mg	**0%**		
Sodium 49mg	**2%**		
Total Carbohydrates 6.3g	**2%**		
Dietary Fiber 1.5g	**6%**		
Protein 2.1g			
Vitamin A 0%	•	Vitamin C 32%	
Calcium 2%	•	Iron 6%	