



Unit 2: Macromolecules McMush Lab Investigation

INSTRUCTOR:

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1. Go to the Lab [Website](#)

Introduction:

Just what is in a fast food meal??? We hear that fast food meals are "bad", but do they have anything good in them? Can they provide some nutrition? Are they really high in fat? Well, let's find out!!! Carbohydrates, proteins, fats, vitamins, and other nutrients provide your body with energy and provide the raw materials necessary to carry on life activities. These compounds are present in the plants and animals you use as food. In this lab, you will test for specific compounds and then determine if these are in a fast food value meal in sufficient quantities.

Materials:

- McDonald's Quarter Pounder Meal
- Benedict's solution- tests for sugar (carbohydrates)
- Biuret solution- tests for protein
- Lugol's iodine solution- tests for starch (complex carbohydrates)
- Blender- gotta mix it all together to test it!!

SAFETY NOTE!!! FOR THIS LAB, YOU MUST WEAR EYE PROTECTION!!!

To determine if these substances are in a sample of McMush, we need to know what a positive test looks like for each of these components. So, our first part of the experiment will be to run tests on known samples to see what a positive test looks like.

Pre-Lab Questions

1. What are Biomolecules?
2. List the four biomolecules and provide examples of foods that contain them.
3. Which types of biomolecules do you predict that you will find in a McDonald's Quarter Pounder Meal? Explain your prediction.
4. What percentage of a McDonald's Quarter Pounder Meal do you predict is Fat? Explain your prediction.

5. How are monomers and polymers different?
6. What are the *monomers* for each of these macromolecules?
 - a. Carbohydrates—
 - b. Nucleic Acids—
 - c. Proteins—
7. Circle any of the following compounds that would be classified as carbohydrates.

a. amino acids	e. fructose
b. triglycerides	f. maltose
c. glucose	g. starch
d. hemoglobin	h. lactose
8. What's the purpose of the McMush Lab?
9. What will we do in Part I? Why?
10. What will we do in Part II? Why?

Part I: Testing of Known Substances

Record your results in a data table:

Food Substance	Reagent test	Color Change	Positive Results (Y/N)
Protein	Biuret solution		
Simple Sugar	Benedict's solution		
Starch	Lugol's Iodine		
Lipid	Sudan IV		

Part II: Test Different Foods

Food Substance	Reagent test	Color Change	Positive Results (Y/N)
Protein	Biuret solution		
Potatoes			
Orange Juice			
Nuts			
Eggs			
Salmon			
Milk			
Simple Sugar	Benedict's solution		
Potatoes			
Orange Juice			
Nuts			
Eggs			
Salmon			
Milk			
Starch	Lugol's Iodine		
Potatoes			
Orange Juice			
Nuts			
Eggs			
Salmon			
Milk			
Lipid	Sudan IV		
Potatoes			
Orange Juice			
Nuts			
Eggs			
Salmon			
Milk			



Answer these questions briefly but completely! **Work on your own! DO NOT DISCUSS THESE QUESTIONS!**

1. What are the macromolecules from which we get energy?
2. Summarize what we did today... if someone did not know what we did in class, describe what we did. Try to provide enough detail that someone who was not in class would understand what we did, e.g., why did we need to run the first set of tests before we analyzed the food?
3. What did we find? (Describe your results for each individual test and what it says about various foods). Which foods are healthy? Explain what we did and didn't learn from these tests.