# FOOD LAB

Sp95

TESTS - Benedict's soln, copper sulfate ($CuSO_4$), iodine ($I_2KI$), sodium hydroxide (NaOH), sudan.

The fuel nutrients in food include: carbohydrates (sugars & starches), lipids (fats & oils), and proteins (amino acids). These will be identified using simple chemical tests in this lab.

STARCHES - The chemical test for starch is iodine solution ($I_2KI$), which is normally deep brown in color. When mixed with materials containing starch, the iodine turns blackish.

• Liquids - Place a small amount of liquid food into a shallow dish or test tube (filling about one-quarter inch), and add 1 or 2 drops of iodine. Record any color changes in the iodine.

• Solids - Place a small piece of solid food into a shallow dish, and add 1 or 2 drops of iodine. Record any color changes in the iodine.

SUGARS - The chemical test for sugar is Benedict's solution, which is normally light blue. When mixed with foods containing sugar and heated in hot water, it turns yellow- orange.

• Liquids - Place a small amount of liquid food into a test tube (filling about one-quarter inch), and add 5 drops of Benedict's solution. Hold the test tube in a boiling water bath for about 30 seconds (or until its color changes). Remove the tube from the water bath afterwards.

• Solids - Crush a piece of solid food, and then proceed with the test described above.

LIPIDS - The test for lipids is different whether the food is a liquid or a solid. Sudan solution is used for liquid materials, while a plain piece of paper is used for testing lipids in solids.

• Liquids - Place a small amount of liquid food into a test tube (filling about one-quarter inch), and add 2 drops of the Sudan (a red water-based dye). If the Sudan does not dissolve or if it forms distinct bubbles, then lipids have been found in the food material. But if the Sudan dissolves uniformly throughout the food, then it probably does not contain any lipids.

• Solids - Smear the solid food onto a piece of paper towel, and then wipe it off. After the paper has dried, inspect it for grease spots; otherwise it probably does not contain any lipids.

PROTEINS - The test for protein requires 2 solutions, sodium hydroxide (NaOH) and copper sulfate ($CuSO_4$). When both chemicals are mixed with protein, they turn purple or pink in color.

• Liquids - Place a small amount of liquid food into a shallow dish or test tube (filling about one-quarter inch). Add 5 drops of sodium hydroxide plus 5 drops of copper sulfate. Record any color changes to the mixture.

• Solids - Cut a small piece of solid food, and then proceed with the test described above.

CLEAN UP - (1) Dispose all food materials into the garbage can (do not dump anything into the sink). (2) Clean all glassware with soap and a test tube brush.

# FOOD LAB - PART I

PRINT NAME _____ , _____

Sp95

MATERIALS - 4 test tubes in a beaker.

Test chemicals - iodine ($I_2KI$), Benedict's solution, sudan IV, copper sulfate ($CuSO_4$), and sodium hydroxide (NaOH).

Food materials - Starch solution, glucose solution, vegetable oil, and albumin solution.

| TEST | Food Material Tested | Test Chemical | No. drops of test chemical used | Color of test chemical before test | Color of test chemical after test |
|---|---|---|---|---|---|
| Starch | | | | | |
| Sugar | | | | | |
| Lipid | | | | | |
| Protein | | | | | |

QUESTIONS

1. Which of these tests was the least difficult to perform, and why?

2. Which of these tests was the most difficult to perform, and why?

3. Identify 2 other nutrient molecules found in foods that would be interesting to test for?

CLEAN UP - (1) Clean all test tubes with soap and a test tube brush, especially the one with vegetable oil. (2) Return all glassware and chemicals to the cart neatly.

# FOOD LAB - PART II

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Sp95

MATERIALS - Test tubes in a beaker, spotting plate, razor blade, mortar & pestle, 5 food samples.

Test chemicals - iodine ($I_2KI$), Benedict's solution, sudan IV, copper sulfate ($CuSO_4$), and sodium hydroxide (NaOH).

RESULTS - Record + if you found the nutrient in your food sample, and – if you did not.

| FOOD SAMPLE | Starch | Sugar | Lipid | Protein |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |

QUESTIONS

1. Which of the food materials, if any, contained all of the nutrient molecules tested?

2. Which of the food materials contained the fewest of the nutrient molecules tested?

3. Discuss the best way to achieve a balanced diet, and include your test results in your answer.

CLEAN UP - (1) Dispose all food materials into the garbage can (do not dump anything into the sink). (2) Clean all glassware with soap and a test tube brush.