

EXPERIMENT 41: TESTS FOR NUTRIENTS

Equipment: Wire gauze, Bunsen burner, 2-3 test tubes, 150 mL beaker.

Materials: Foods, bread, egg, Benedict's solution, Lugol's iodine solution, glucose(aq), concentrated nitric acid, concentrated NH₄OH, hexane, filter paper.

In this experiment, you will learn simple tests used by chemists to detect the presence of different nutrients in foods.

A. **Test for mineral matter:** Place a piece of bread on the ceramic center of a wire gauze, and direct a flame on it until the bread is completely burned.

1. Describe the residue. _____

B. **Test for protein:** Place a small piece of the white of a hard boiled egg in a test tube and add a few drops of concentrated nitric acid. Rinse the egg with water. Add a few drops of concentrated ammonium hydroxide to the egg.

2. Describe what you see. _____

C. Place a drop of hexane on a piece of filter paper and allow it to evaporate.

3. Is a spot left on the paper where the hexane evaporated? _____

D. **Test for Fats (Demonstration):** Fill the curved bottom of a dry test tube with crushed peanuts and add hexane (keep away from flames) to the depth of an inch. Place the test tube in a beaker containing hot water. **Caution: There should be no flame under the beaker.** Draw hot water from the hot water faucet at the teacher's table. Shake the contents of the test tube onto a piece of filter paper and allow the hexane to evaporate.

4. Describe the appearance of the paper. _____

5. Compare the result with that obtained in "C". _____

E. **Test for glucose** with Benedict's solution and **for starch** with iodine as directed in Experiment 39 on "The Conversion of Starch to Glucose". Observations:

F. **Test some samples of food** for glucose, starch, protein, mineral matter, and fat.

6. Enter the results in the table on the next page.

TABLE OF RESULTS

FOOD TESTED	PROTEIN	GLUCOSE	STARCH	MINERAL MATTER	FAT

SUMMARY QUESTIONS

- List foods that are rich in (a) protein; (b) starch; (c) mineral matter; (d) fat.
- Explain what is meant by a "balanced diet".
- Make a list of what you had for breakfast or lunch. Was it a balanced meal? Explain.
- Look up and draw the structures of Glucose, Maltose, Stearin.