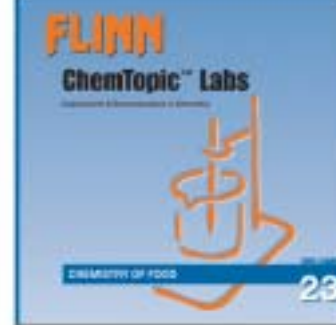


Chemistry of Food— Experiment Summaries and Concepts



Food Testing Lab—Carbohydrates, Proteins, and Fats

The Food Guide Pyramid is a familiar symbol of healthy eating and good nutrition. The recommended number of servings for different foods promotes an energy balance of carbohydrates, proteins, and fats in the diet. The purpose of this experiment is to identify the biochemical nutrients in a variety of foods using a series of classification tests. Students gain an understanding of the chemical make-up of the substances found in their favorite foods.

Milk Is a Natural—Biology, Chemistry, and Nutrition

Why is milk considered a natural, nutritionally complete food source? In this real-world activity at the crossroads of biology, chemistry, and nutrition, students separate the protein and carbohydrate components of skim milk, analyze their properties, and confirm their identity. They then verify their findings with the information provided on the Nutrition Facts label for skim milk.

Boning Up on Calcium—Microscale Analysis of Calcium in Milk

Healthy body, good teeth, strong bones—the benefits of calcium in nutrition are well known. Explore the chemistry behind the nutrition with this microscale experiment that measures the amount of calcium in milk. The calcium ions in milk are titrated using EDTA and a metal-ion indicator. The microscale titration is fast and easy to perform and gives reliable results. Enthusiasm runs high as students compare the accuracy of their results with nutritional label information.



Vitamin C Analysis—Fruits and Fruit Juices

Vitamin C is an important nutrient. The purpose of this microscale experiment is to determine the amount of Vitamin C in different fruit juices by means of an oxidation–reduction titration with a special dye. Do all juices contain Vitamin C? Is the Vitamin C content stable over time? Students learn all about the structure, reactions, and stability of Vitamin C with this interesting experiment.



Total Acidity—Titration of Fruit Juices

Fruit juices get their sweet taste from natural sugars and their sour taste from acids, especially citric acid. The balance of sugar to acid content is one of the main factors responsible for the refreshing taste of fruit juices. The purpose of this experiment is to compare the citric acid content in a variety of fruit juices. The concentration of citric acid in each juice is determined by acid–base titration with sodium hydroxide, which measures the “total acidity” of the juice. Students need to pay attention to see if their results match their predictions!

Concepts

- Benedict’s test
- Starch–iodine test
- Biuret test
- Sudan III test
- Protein
- Carbohydrate
- Fat
- Reducing sugar
- Calcium in nutrition
- Titration
- EDTA–complex ion formation
- Accuracy and precision
- Vitamin C
- Oxidation–reduction
- Titration
- Endpoint
- Acid–base neutralization
- Stoichiometry
- Titration
- Concentration and molarity