food composition chemistry

Proteins, carbohydrates and fats are the principal structural components of living cells. Lipids are a class of food chemicals that include fats and oils. They are the most concentrated source of food energy providing 9 calories of energy per gram. In our bodies, lipids carry the fat-soluble vitamins, contribute to food flavor and help us feel full after eating. Fats and oils are available in many forms. Fats are solid at room temperature while oils are liquid.

demo 3. test for lipids

Preparation Time 5 minutes

Laboratory Time 30 minutes

Cut four, 2-inch squares from a brown paper grocery bag.

Add a drop of cooking oil to the center of one square and rub the oil in with your finger.

Add a drop of water to the center of another square and rub it in with your finger. Allow to dry.

Hold each square to a light source.

Students should observe that the oil spot allows some light to pass through. A translucent spot is a positive test for the presence of fats. An opaque spot is a negative test for fats.

Repeat the test using two more food samples (bread, butter, cheese, cereal, honey, peanut butter). Allow time for the samples to dry.

Have the students identify which food samples contain fats and which do not.

demo 4. test for rancidity

Preparation Time 5 minutes

Laboratory Time 1 minute

Lipids are subject to a chemical reaction in foods called oxidative rancidity. Foods like peanut butter, crackers, potato chips, crackers and cereals can develop a stale taste and flavor if the reaction is allowed to occur. Light and oxygen accelerate the reaction.

Fill four glass jars with fresh potato chips. Wrap two jars in aluminum foil to exclude all light.

Place a tight fitting lid on one jar with foil and on one jar without.

Store all four jars in an area where they will be exposed to light.

Each day for one week have the students taste the chips from each jar. Rate the flavor using the following five-point scale: 1 = extremely dislike, 2 = slightly dislike, 3 = neither like nor dislike, 4 = slightly like. 5 = extremely like.

Students should observe that both the oxygen and sunlight affect the development of oxidative rancidity.

