

Chapter 9: Fats & Oils

FATTY DISTINCTION

Did you know that fat is added to many foods?



There are many functions of fat depending upon the type. Butter and margarine are examples of fats that are solid at room temperature. Cooking oils, such as olive oil or vegetable oil, are examples of fats that are liquid at room temperature. Fats that are solid at room temperature have higher **melting points**, meaning more heat is needed to melt the solid fat into a liquid. The exact temperature at which a solid fat becomes a liquid is considered the melting point.

Fats are also known as fatty acids. Fatty acids are categorized as saturated or unsaturated based on their chemical structure. **Saturated fats** hold all the hydrogen bonds that can be attached to the carbon. In other words, the hydrogen molecules are “saturated” with carbon molecules. **Unsaturated fats** contain double bonds between the carbons instead of being saturated with hydrogen. **Trans fats** are unsaturated fatty acids that have been turned into saturated fatty acids by breaking the double bond between the carbon atoms and forcing hydrogen atoms on to the carbon atoms. This conversion allows

liquids to become solid at room temperature, creating fats like margarine. This transformation also results in a higher melting point.

Unsaturated fats are beneficial for our body. They help protect our heart by increasing good cholesterol and decreasing bad cholesterol. Foods like almonds, salmon, and avocados are high in these healthy fats. Trans fats have the opposite effect on health. You will learn more about saturated and unsaturated fats in *Food Explorations Lab I* of this chapter.



Fats can also be used in mixtures. There are two main types of mixtures: homogeneous and heterogeneous. **Homogeneous** mixtures are the same throughout and have a uniform appearance (e.g. milk), while **heterogeneous** mixtures are not the same throughout. They have more than one color, substance, or texture visible. Fat emulsions are considered a heterogeneous mixture. An **emulsion** is a mixture of two liquids that won't mix together homogeneously (oil and water) on their own without an emulsifier added. When a fat is mixed with an emulsifier, like eggs, the fat and water are able to mix to form a uniform liquid. Salad dressings and mayonnaise are the most common types of emulsions we eat. You will learn more about emulsions in *Food Explorations Lab II* of this chapter.



Depending on the melting point, a fat can be liquid or solid at room temperature.

Even though consuming too much fat is not considered healthy, it is important to consume adequate amounts of fat in our diet. Our bodies need fat for energy, nerve and brain function, and growth; however, we still need to be careful about the types and amounts of fat we choose to consume. You should choose to eat foods that are high in unsaturated fats and moderate in saturated fatty acids. If possible, you should eliminate trans fat from your diet. Newer food production technologies have been created to help reduce the level of trans fats in many foods.

Avoiding overconsumption of these foods will help decrease our risk for diet-related diseases such as heart disease, stroke, overweight/obesity, and Type 2 Diabetes. Let's explore the many functions of fat!



Think About It

Food Explorations Lab I

1. Unsaturated fats contain double bonds between carbon atoms.
2. Saturated and trans fats have higher melting points than unsaturated fats.

Food Explorations Lab II

1. A mixture of oil and water is heterogeneous (heterogeneous/homogeneous).
2. An emulsion is a homogeneous (heterogeneous/homogeneous) mixture.
3. A(n) emulsifier must be added to a mixture to make it uniform.