



SNS COLLEGE OF TECHNOLOGY

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COIMBATORE-641 035, TAMIL NADU



19FTB202- BIOCHEMISTRY FOR FOOD TECHNOLOGY

UNIT 2 - LIPIDS

TOPIC 5 & 6 Essential Fatty Acids & Industrial uses of Lipids

There are two types of fatty acids: essential and nonessential. The body can create nonessential fatty acids by converting amino acids in the foods a person eats.

However, the body cannot create essential fatty acids. It can only get them directly from food sources. Essential fatty acids include linoleic acid (LA), an omega-6 fatty acid, and alpha-linolenic acid (ALA), an omega-3 fatty acid.

Essential fatty acids are a type of polyunsaturated fatty acid. There are two categories of essential fatty acids: omega-3 and omega-6.

Omega-3 and omega-6 fatty acids are necessary for the body to function correctly. They make compounds called eicosanoids, which are important hormones that control the immune system, nervous system, and other hormones.

Eicosanoids from omega-3 fatty acids promote heart health, while eicosanoids from omega-6 increase immune response, inflammation, and blood pressure.

Essential fatty acids foods

Certain foods are high in essential fatty acids.

Omega-3s

Plant sources of omega-3s, also called ALAs, :

- flaxseed oil
- chia seeds
- walnuts
- flaxseeds

- walnut oil
- canola oil
- soybean oil
- mustard oil
- tofu

Animal sources of omega-3s are called docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA).

Sources of DHA

- mackerel
- salmon
- herring
- fish oil
- tuna
- anchovies
- sardines
- sea bass
- swordfish

Sources of EPA

- menhaden
- salmon
- trout
- halibut
- herring
- shad
- sablefish

- wolffish

Omega-6s

Food sources of omega-6s, also called LAs, include:Trusted Source

- canola oil
- soybean oil
- corn oil
- sunflower oil
- safflower oil
- chia seeds
- walnuts
- hazelnuts
- almonds
- Brazil nuts

Industrial uses

Role of Lipids in Food

High Energy Source

Fat-rich foods naturally have a high caloric density. Foods that are high in fat contain more calories than foods high in protein or carbohydrates. As a result, high-fat foods are a convenient source of energy. For example, 1 gram of fat or oil provides 9 calories compared with 4 calories found in 1 gram of carbohydrate or protein. Depending on the level of physical activity and on nutritional needs, fat requirements vary greatly from person to person. When energy needs are high, the body welcomes the high-caloric density of fats. For instance, infants and growing children require higher amounts of fat to support normal growth and development. If an infant or child is given a low-fat diet for an extended period, growth and development will not progress normally. Other individuals with high-energy needs are athletes, people who have physically demanding jobs, and those recuperating from illness. When the body has used all of its calories from carbohydrates (which can occur after just twenty minutes of exercise), it initiates fat usage. A professional swimmer must consume large amounts of food energy to meet the demands of swimming long distances, so eating fat-rich foods makes sense. In contrast, if a person who leads a sedentary lifestyle eats the same fat-rich foods, they will likely get more fat calories than their body requires.

Smell, Taste, Texture, and Satiety

Fat contains dissolved compounds that contribute to mouth-watering aromas and flavors. Fat also adds texture to food and helps keep baked foods moist. Fats contribute to smooth, creamy, moist, tender, and crispy textures of various foods. Frying foods locks in flavor and lessens cooking time. Fat plays another valuable role in nutrition. Fat contributes to satiety, or the sensation of fullness. Fats take longer to digest than carbohydrates or protein because fats move slower through the digestive tract, thus promoting an overall sense of fullness. Oftentimes before the feeling of fullness arrives, people overindulge in fat-rich foods, finding the delectable taste irresistible. Indeed, the very things that make fat-rich foods attractive also make them a hindrance to maintaining a healthful diet.