

FATS

Trans Fats

- Hydrogenated vegetable oils
- Fast foods
- Cakes/pastries
- Chocolate
- Deep Fried Food



Saturated Fats

Vegetable Fats

- Coconut
- Palm oil
- 3-in-1 & 2-in-1 beverages, creamer, condensed milk



Animal Fats

- Poultry skin
- Fatty meat
- Butter
- Ghee
- Tallow / lard
- Full cream dairy products



Unsaturated Fats

Polyunsaturated

- Corn oil
- Soybean oil
- Sunflower oil
- Seeds
- Cold-water fish



Monounsaturated

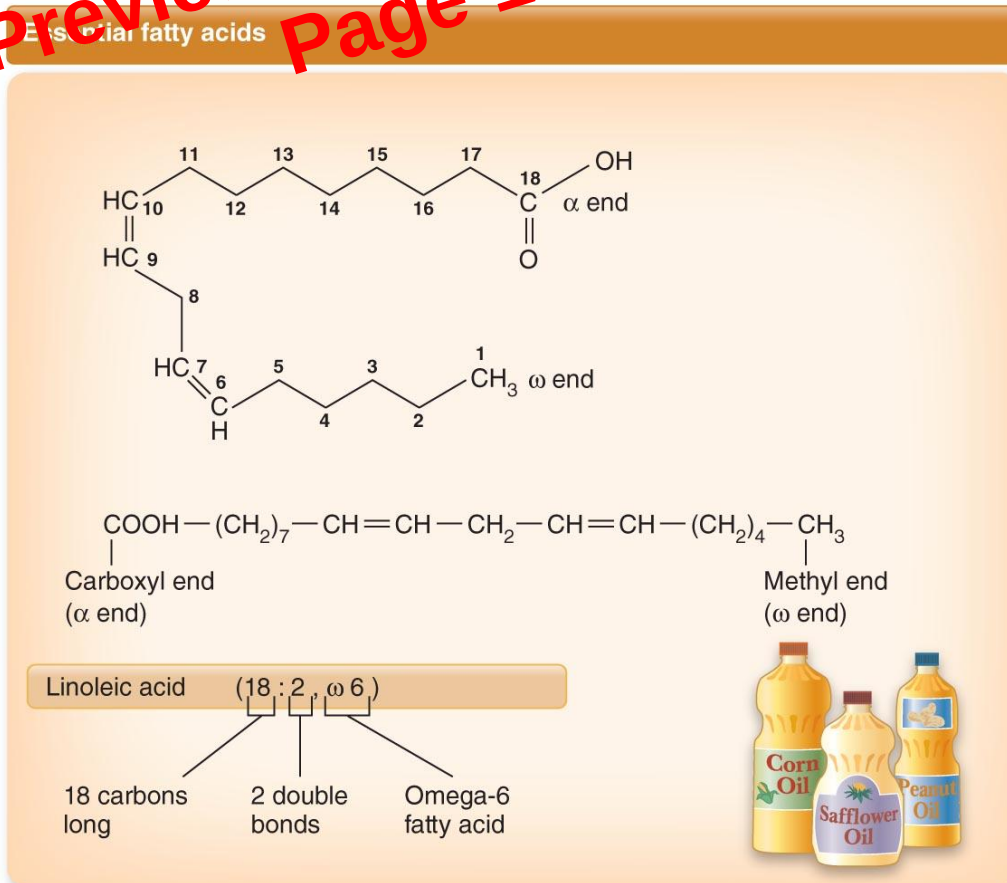
- Olive oil
- Canola oil
- Peanut oil
- Sesame oil
- Avocado
- Most nuts



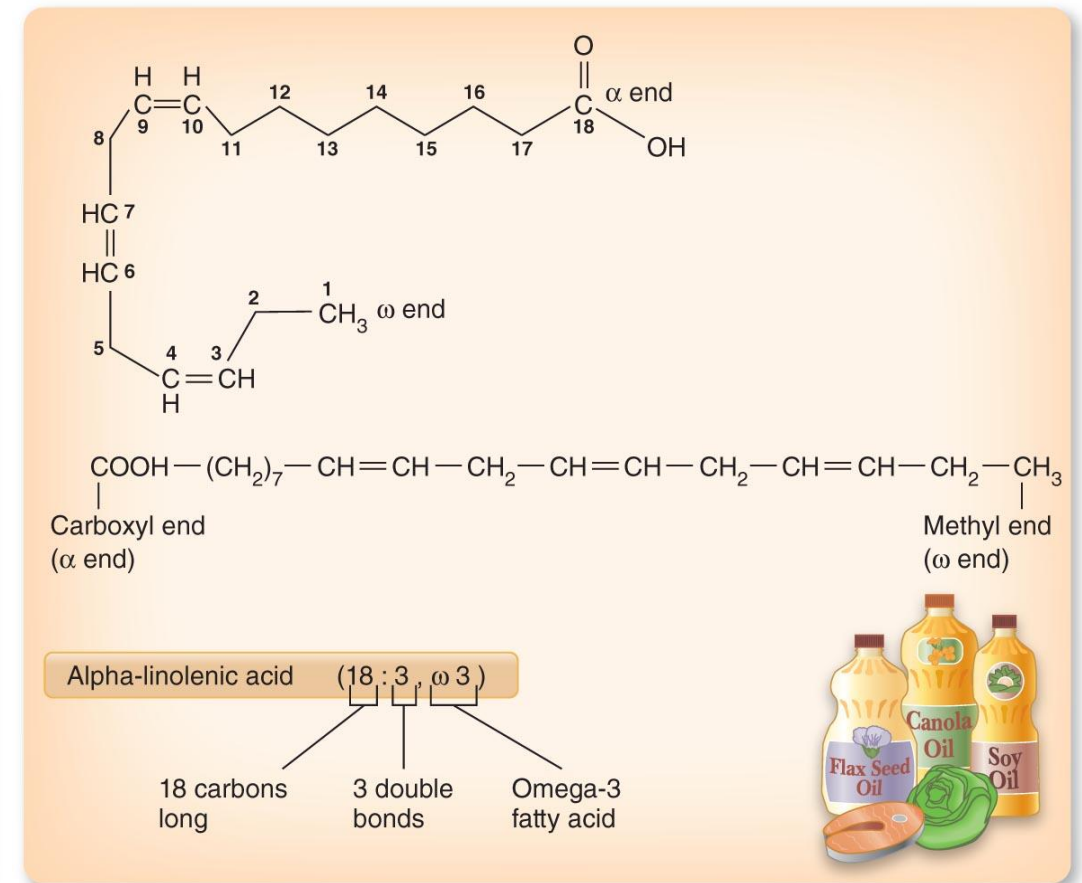
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Triglycerides (cont.)

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(a)



(b)

The majority of lipid digestion takes place in the small intestine, with the help of bile from the liver and digestive enzymes from the pancreas. Micelles transport the end products of lipid digestion to the enterocytes for absorption and eventual transport via the blood or lymph.

ORGANS OF THE GI TRACT

MOUTH

Lingual lipase secreted by tongue cells and mixed with saliva digests some triglycerides. Little lipid digestion occurs here.

STOMACH

Most fat arrives intact at the stomach, where it is mixed and broken into droplets. Gastric lipase digests some triglycerides.

SMALL INTESTINE

Bile from the gallbladder breaks fat into smaller droplets.

Lipid-digesting enzymes from the pancreas break triglycerides into monoacylglycerides and fatty acids.



Lipid-digesting enzymes from the pancreas break dietary cholesterol esters and phospholipids into their components.



Products of fat digestion combine with bile salts to form micelles.



Micelles transport lipid digestion products to the enterocytes.

Within enterocytes, components from micelles reform triglycerides and are repackaged as chylomicrons for transport into the lymphatic system.

Shorter fatty acids can be absorbed directly into the bloodstream.

ACCESSORY ORGANS

SALIVARY GLANDS

Produce saliva.

LIVER

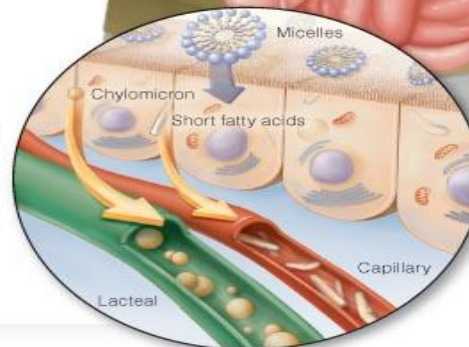
Produces bile, which is stored in the gallbladder.

GALLBLADDER

Contracts and releases bile into the small intestine.

PANCREAS

Produces lipid-digesting enzymes, which are released into the small intestine.



Absorption of Fats (cont.)

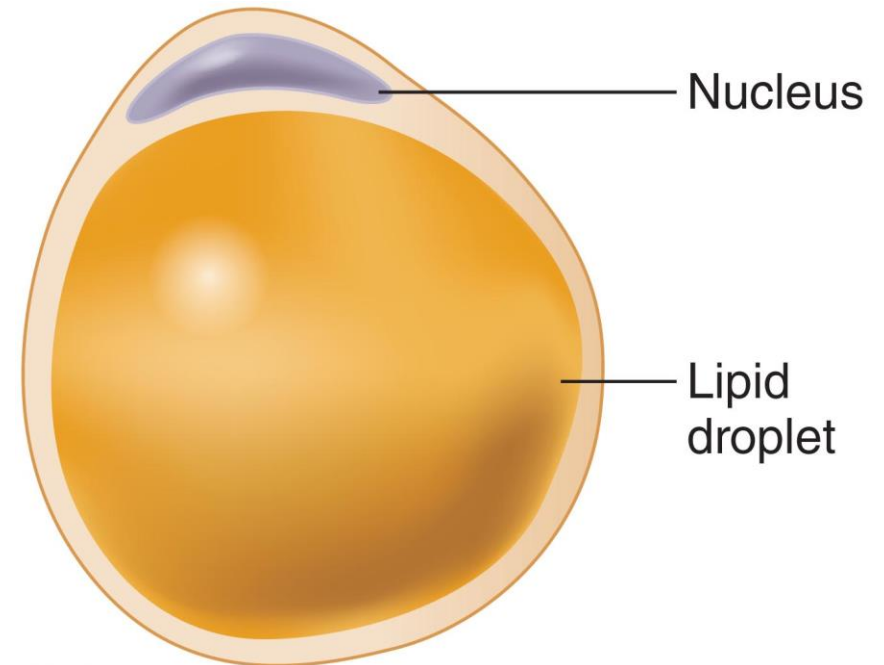
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- Chylomicrons are transported out of the enterocyte, then:
 - Travel through the lymphatic system
 - Are transferred to the bloodstream through the thoracic duct
- Short- and medium-chain fatty acids are absorbed more quickly since they are not arranged into chylomicrons

Absorption of Fats (cont.)

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- Triglycerides in chylomicrons must be disassembled by **lipoprotein lipase** before they can enter body cells
- In body cells, triglycerides can be:
 - Used immediately for energy
 - Used to make lipid-containing compounds
 - Stored in muscle and adipose tissues



Cardiovascular Disease

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- Cardiovascular disease
 - Heart diseases are the leading cause of death in the US
 - Dysfunction of the heart or blood vessels
 - Can result in heart attack or stroke
 - Hypertension increases risk for heart attack or stroke

Blood Lipid Levels:

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- The target lipid values are as follows:
 - Total cholesterol (mg/dl): <200 mg/dl
 - LDL-cholesterol (mg/dl): <130 mg/dl
 - HDL-cholesterol (mg/dl): >40 mg/dl
 - Triglycerides (mg/dl): <150 mg/dl

High-Fat Diets and Cancer

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- Three types of cancer have been studied extensively for their possible relationship to dietary fat intake:
 - *Breast cancer*
 - *Colon cancer*
 - *Prostate cancer*