



Fats and Lipids



Questions

- What should be the normal intake for fatty foods?
- What is the difference between lipids and fats?
- Aside from fattening, is ice cream really bad for you if you have low cholesterol?
- What are bad fats, lipids?
- How much total fat is considered healthy in a given food amount?
- How often can I eat fats?



Types of Lipids

- Triglycerides
- Phospholipids
- Sterols
- All are found in the body and in foods



Lipids Functions in the Body

- Energy Stores
- Insulates vital organs
- Protection against temperature extremes
- Provide essential fatty acids
- Carry fat soluble nutrients

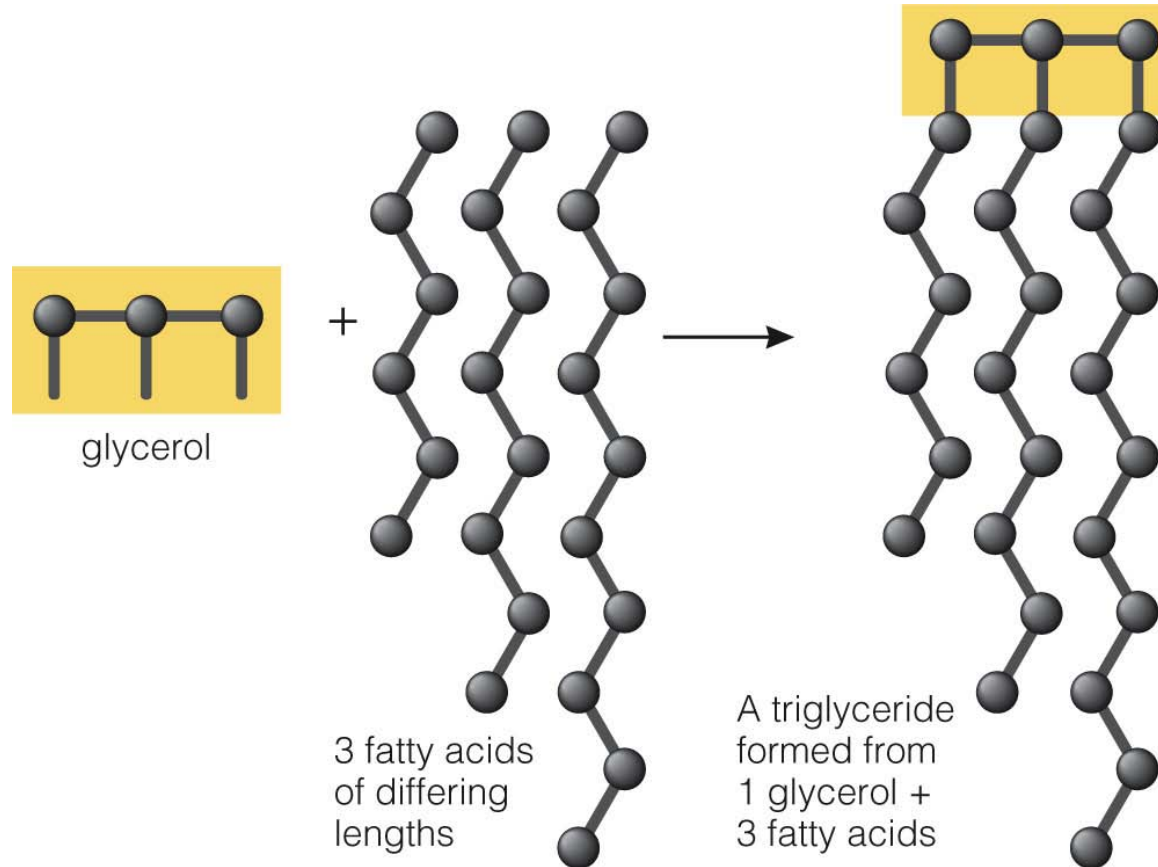


Triglycerides

- Organic compound
- Structure:

- Classification:

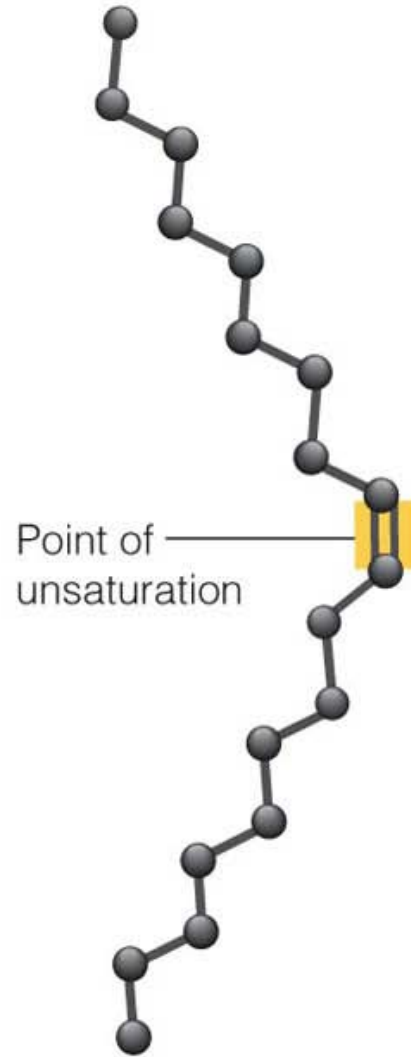
Triglyceride Structure



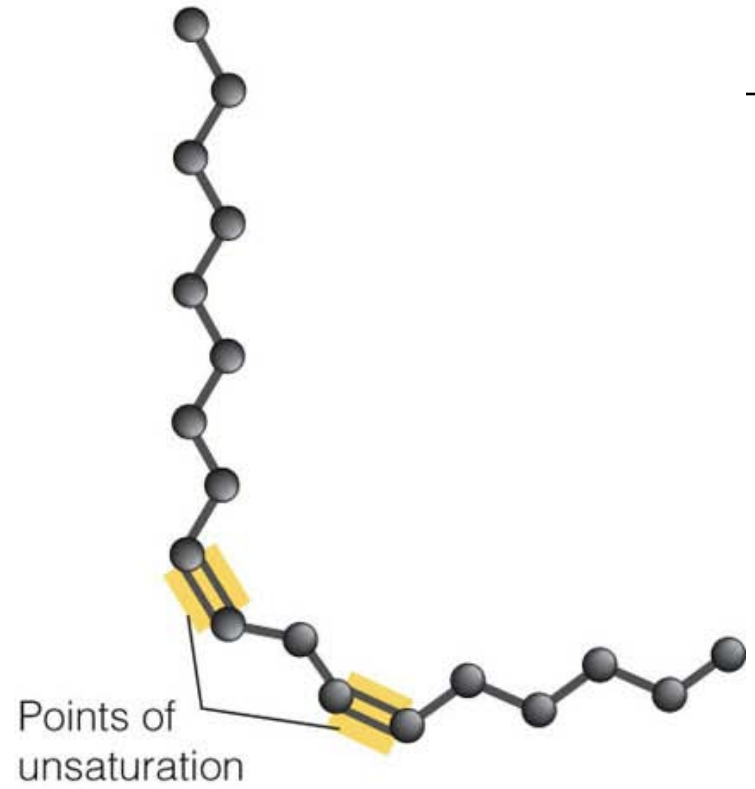
Saturated



Monounsaturated



Polyunsaturated





Saturated Fatty Acids

- Definition
- Composition
- Food examples



Monounsaturated Fats

- Definition
- Composition
- Food sources include:



Polyunsaturated Fatty Acids

- Definition
- Composition
- Food sources include



Essential Fatty Acids

- Definition
- Composition

- Functions of Essential Fatty Acids

- Fatty acid composition of US diets



Omega 3 Fatty Acids

- Functions
- Food sources



Omega 6 Fatty Acids

- Functions
- Dietary Recommendations
- Food sources include:



Phospholipids

- Definition
- Composition
- Solubility
- Functions



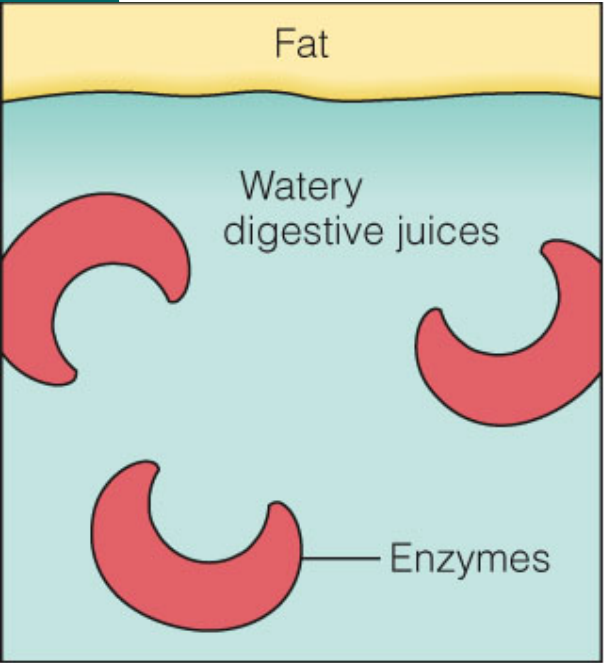
Sterols

- Definition
- Function
- Sources

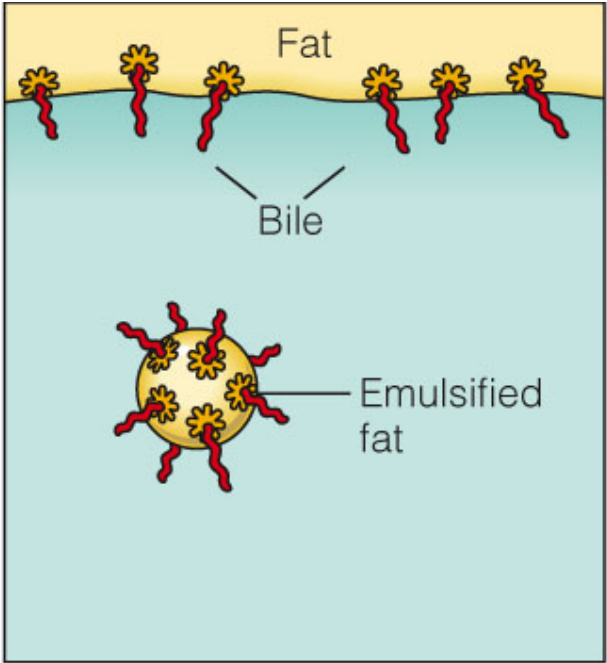
Digestion and Absorption of Lipids

Dietary Sources:

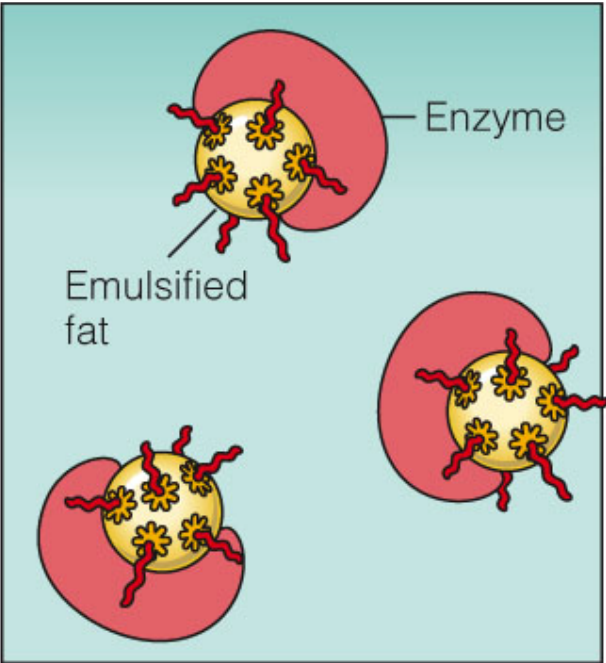




In the stomach, the fat and watery digestive juices tend to separate. Enzymes are in the water and can't get at the fat.



When fat enters the small intestine, the gallbladder secretes bile. Bile has an affinity for both fat and water, so it can bring the fat into the water.



After emulsification, more fat is exposed to the enzymes, and fat digestion proceeds efficiently.



Digestion and Absorption of Lipids

Non-Dietary Sources:

-



Lipids in Foods

- Fatty Acids and Triglycerides
- Phospholipids:
- Cholesterol:



Health Effects of Lipids

- Heart Disease
- Obesity



Dietary Fat and Serum Cholesterol Levels

- Saturated Fat and Trans Fats
- Polyunsaturated Fat
- Monounsaturated Fat



Lowering Cholesterol and LDL with Diet

- Reduce Saturated Fat
- Try to eliminate all trans fats
- Limit dietary cholesterol intake
- Substitute mono and polyunsaturated fats in place of saturated and trans fats
- Increase dietary fiber and plants sterols/stanols

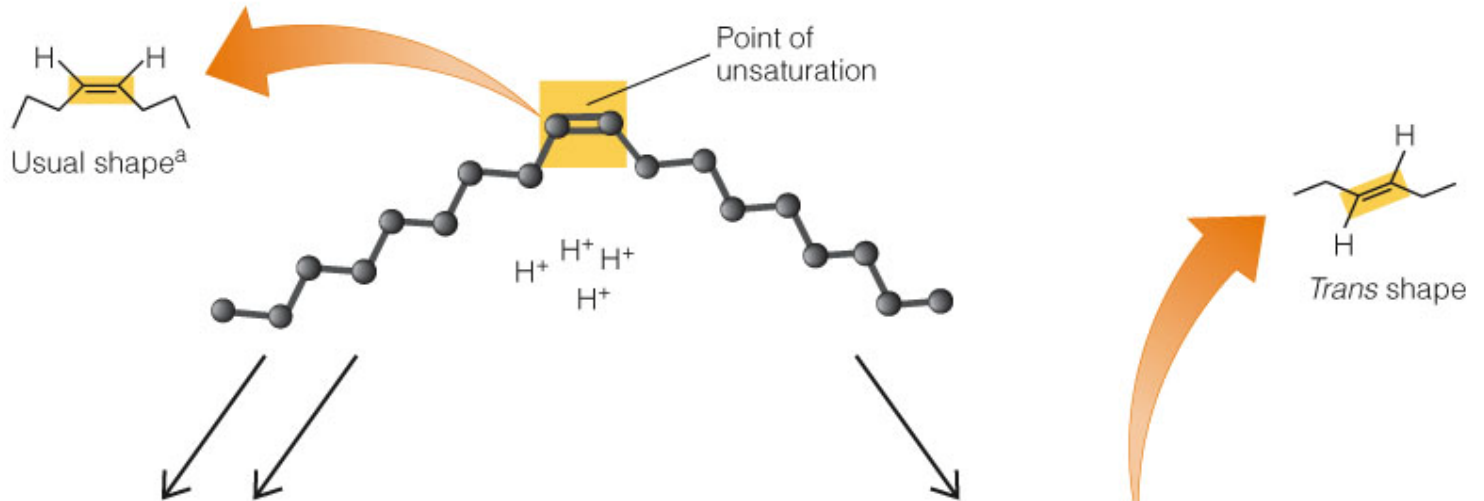


Reducing Saturated Fats

- Avoid butter, lard, solid shortening, stick margarine, cream cheese, sour cream
- Use lean cuts of meat; limit to 4-6 oz/day
- Consume nonfat or lowfat dairy products
- Reduce intake of cakes, cookies, pastries, ice cream
- Limit oils, margarines, mayonnaise, salad dressings
- Try to avoid tropical oils (coconut, palm)

Unsaturated fatty acid

Points of unsaturation are places on fatty acid chains where hydrogen is missing. The bonds that would normally be occupied by hydrogen in a saturated fatty acid are shared, reluctantly, as a double bond between two carbons that both carry a slightly negative charge.



Usual shape^a

Point of unsaturation

Trans shape

Hydrogenated fatty acid (now fully saturated)

When a positively charged hydrogen is made available to an unsaturated bond, it readily accepts the hydrogen and, in the process, becomes saturated. The fatty acid no longer has a point of unsaturation.

Trans-fatty acid

The hydrogenation process also produces some *trans*-fatty acids. The *trans*-fatty acid retains its double bond but takes a twist instead of becoming fully saturated. It resembles a saturated fatty acid both in shape and in its effects on health.

Increase Mono and Polyunsaturated Fats

- Monounsaturated
- Polyunsaturated

Remember portion size is key!!!



Increase Omega 3 Fatty Acids

Reduce Dietary Cholesterol

- Limit dietary cholesterol to <200 mg/day

Increase Dietary Fiber

- Insoluble fiber:
- Soluble fiber:
- Goal:



Increase Plant Sterols/Stanoles

- Definition
- Function
- Recommended Intake
- Food sources