CONCEPT: PHYSICAL PROPERTIES OF FATTY ACIDS

- The physical properties of fatty acids are determined by carbon chain length and their number of _____ bonds.

Solubility in Water

- The length of carbon chain is _____ proportional to solubility in water.
  - □ ___ the length of carbon chain ___ the solubility in water.

EXAMPLE: Which of the following fatty acids would have the lowest solubility in water?

a) Palmitic acid (16:0) b) Oleic acid (18:1) c) Lauric acid (12:0) d) Arachidic acid (20:0)

Melting Point

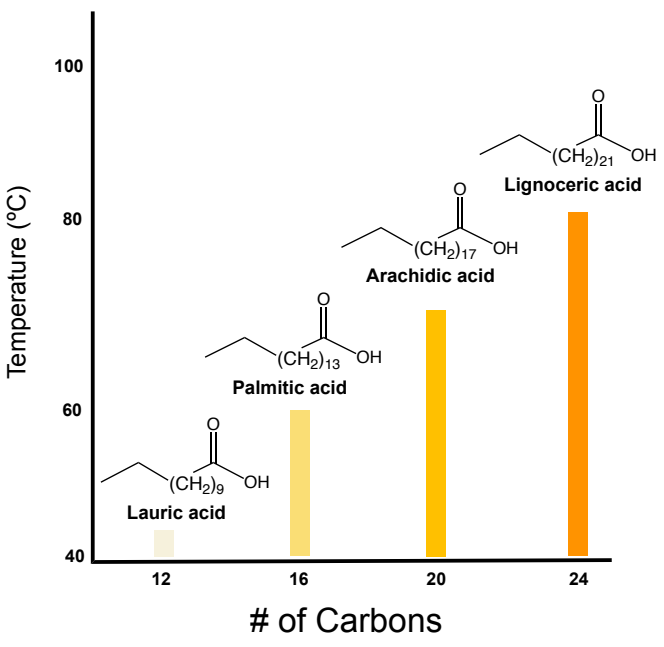
- Carbon chain length and the number of pi bonds have _____ effects on the melting points of fatty acids.

Melting Point Factors

Melting Point (Carbon Chain Length)

Length is _____ proportional to MP.

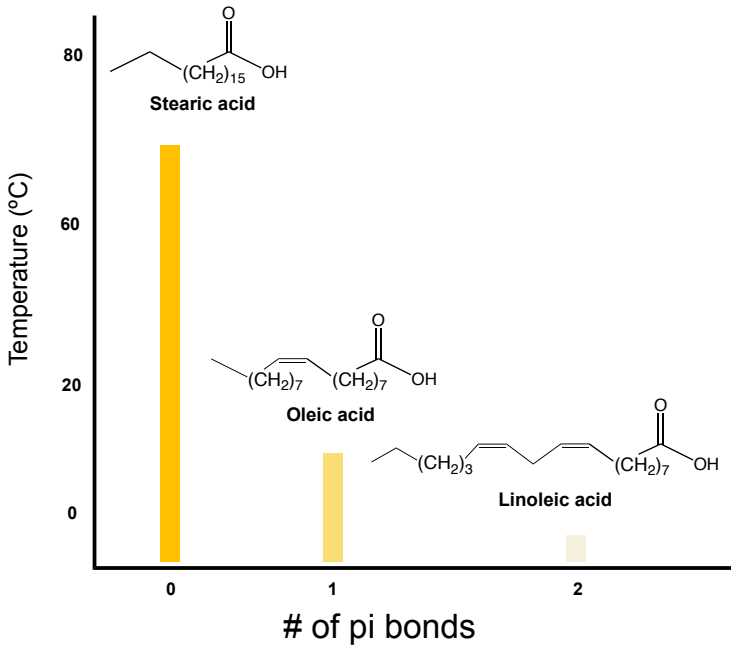
□ ____ carbon chain length ____ the MP.



Melting Point (Pi Bonds)

Number of Pi Bonds is _____ proportional to MP.

□ ____ number of pi bonds ____ the MP.



EXAMPLE: Within each pair, determine the fatty acid with the greater melting point.

a) Stearic acid (18:0) vs Oleic acid (18:1)

b) Linolenic acid (18:3) vs Mead acid (20:3)

c) Vaccenic acid (18:1) vs Palmitoleic acid (16:1)

d) Stearidonic acid (18:4) vs Sciadonic acid (20:3)