Chem 352, Fundamentals of Biochemistry
Lecture 10 - Part I: Lipid Metabolism
Supplemental Questions

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1. Using structures for the intermediates and starting with acylCoA, show the reactions involved in one round of fatty acid degradation by β−oxidation.

2. Describe how the glycerol portion of a fat can be used by the liver to synthesize glucose.

3. Describe why the fatty acid portions of a fat cannot, in general, be used by the liver to synthesize glucose.

4. Where in the cell does the β-oxidation of fatty acids occur.

5. Describe how fatty acids are transported from the cytoplasm into the matrix of the mitochondria where β-oxidation occurs.

6. Write the net balanced equation for the complete β−oxidation of stearoyl-CoA (18:0) to acetylCoA

    a. How many ATP's can be made from the complete oxidation of the products of this reaction ($\rightarrow CO_2 + H_2O$).

7. What are *ketone bodies* and what are they used for?

8. Compare and contrast fatty acid synthesis and β-oxidation of fatty acids.

9. Acetyl-CoA carboxylase is a key enzyme involed in fatty acid synthesis.

    a. What is the classification of the enzyme catalyzed reaction?

    b. What is the product of this reaction?

    c. What is coenzyme used in this reaction.

    d. What is the purpose of putting the carboxyl group on the Acetyl-CoA when it is destined to be removed in the very next step in the fatty acid synthesis pathway?

10. Describe how fatty acid metabolism is regulated in mammals, both locally and systemically.