Metabolic Biochemistry 3350
Dr. Melissa Kelley
Exam IV
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1. (10 points) Compare and contrast β-oxidation and lipogenesis. Your answer should include cellular location, coenzymes which are produced, and end products of each pathway.

2. (15 points) How many ATP can be generated from 1 TAG which contains all palmitate (16:0)? Assume that you completely oxidize the TAG to CO_2. Assumption: 1 NADH~ 3 ATP and 1 FADH2 ~ 2 ATP. To receive credit you must show all of your work.

3. (10 points) My biochemical Camel Clyde has a great deal of fat (TAG) stored in its hump. Explain biochemically why Clyde does not need a drink in the desert.

4. (15 points) Briefly explain the function of each of these lipoproteins.

Chylomicrons

HDL

LDL

5. (20 points) Suppose you have a fatty acid that is 12:0. In the space provided **show only one round** of β-oxidation. Enzymes are not required, but a complete answer should include structures and cofactors.

6. (15 points) A friend of yours reports that their oxidative branch of the pentose phosphate pathway is inactive and they produce no NADPH.

a) What is the effect of their deficiency on lipogenesis?

b) Does their deficiency have any effect on β-oxidation?

c) Your friends blood pH is 7.0 (normal is 7.2). Briefly explain why they have a drop in blood pH.

7. (15 points) Another friend of yours lacks carnitine.

a) What effect would this have on β-oxidation?

b) Your friend complains of being tired and having no energy. Why do you think this is true?