Regulation of Lipid Catbolism

Biochemistry: A Short Course available in reserve[1]. [1]

Contents

Learning Objectives

- Explain how triglyceride breakdown into glycerol and free fatty acids is controlled in adipocytes by hormonal signals.
- Explain how high carbohydrate diets affect fuel utilization, including effects on lipid fuel utilization. Describe at an endocrine level how this is thought to occur.
- Determine how much energy, in ATP equivalents, is released during the oxidation of a given fatty acid. Be able to relate the energy content of a fatty acid, in general to its physical properties (length and saturation).
- Explain the rate limiting steps of lipid oxidation.
- Explain how ketone bodies are converted to ATP in non-hepatic tissues, and what governs this specificity.
- Demonstrate an understanding of how how *de novo* lipogenesis and β-oxidation are reciprocately controlled.
- Describe how very long chain fatty acids are oxidized differently from long chain fatty acids.
- Explain how odd-numbered fatty acids are catabolized, including the importance of vitamin B12 in this process.
- Evaluate the role of transcriptional regulation and long term adaptations to fatty acid oxidative capacity.

In terms of athletic performance, increasing the ability to oxidize fatty acids is important for endurance athletes.