**STUDY GUIDE CHAPTER 3 NUTRITION AND ENERGY SYSTEMS**

**NUTRITION**

1. List the macronutrients and micronutrients.
2. Outline the functions and macronutrients and micronutrients.
3. State the chemical composition of a glucose molecule.
4. Identify a diagram representing the basic structure of a glucose molecule.
5. Explain how glucose molecules can combine to form disaccharides and polysaccharides.
6. State the composition of a molecule of triglyceride.
7. Distinguish between saturated and unsaturated fatty acids.
8. State the chemical composition of a protein molecule.
9. Distinguish between an essential and a non-essential amino acid.
10. Describe current recommendations for a healthy balanced diet.
11. State the approximate energy content per 100g of carbohydrate, lipid (fat) and protein.
12. Discuss how the recommended energy distribution of the dietary macronutrients differs between endurance athletes and non-athletes.

**CARBOHYDRATE AND FAT METABOLISM**

1. Outline metabolism, anabolism, aerobic catabolism and anaerobic catabolism.
2. State what glycogen is and its major storage sites.
3. State the major sites of triglyceride storage.
4. Explain the role of insulin in the formation of glycogen and the accumulation of body fat.
5. Outline glycogenolysis and lipolysis.
6. Outline the functions of glucagon and adrenaline (epinephrine) during fasting and exercise.
7. Explain the role of insulin and muscle contraction on glucose uptake during exercise.

**NUTRITION AND ENERGY SYSTEMS**

1. Annotate a diagram of the ultrastructure of a generalized animal cell.
2. Annotate a diagram of the ultrastructure of a mitochondrion.
3. Define the term cell respiration.
4. Explain how adenosine can gain and lose a phosphate molecule.
5. Explain the role of ATP in muscle contraction.
6. Describe the re-syntheses of ATP by the ATP-CP system.
7. Describe the production of ATP by the lactic acid system.
8. Explain the phenomena of oxygen deficit and oxygen debt.
9. Describe the production of ATP from glucose and fatty acids by the aerobic system.
10. Discuss the characteristics of the three energy systems and their relative contributions during exercise. (limit to fuel sources, duration, intensity, amount of ATP production and by-products).
11. Evaluate the relative contributions of the three energy systems during different types of exercise. (endurance athlete, games player, sprinter).