**Unit 1 – Homework Sheet #3 – Physiology – Chapter 3**

**The Metabolic System – Energy Production at the Cellular Level**

**THE METABOLIC SYSTEM**

Metabolism – What is it?

Metabolism **is the biochemical reactions in the body that generate energy for the body, help build and repair tissues, and aid in the removal of waste.**

The body uses primarily ­­­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ found in food as its main fuel for energy production with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ being used primarily for body repair and growth.

Carbohydrates- When stored in liver and muscle are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

When found in the bloodstream are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - (ATP) – the primary energy molecule of the body that is manufactured by the body from carbohydrates and fats.

Food is converted into ATP by the body so that it can be used for energy!

**A few more interesting fat facts to do with metabolism!**

Fat isn’t all bad- the body needs it to survive.

Stored fat represents the body’s greatest source of potential energy. The average body stores approximately \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kcal of fat while carbohydrate reserves are less than \_\_\_\_\_\_\_\_\_\_\_\_\_\_ kcal.

When fat is needed as fuel, fatty acid comes out of storage, taken to the liver, where it is chemically changed and sent back to working muscles. **You cannot choose where this fat is taken from on the body! Spot reduction is not possible!**

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Three methods of ATP production

|  |  |  |  |
| --- | --- | --- | --- |
| System | Source of Energy/ Efficiency | Length of Time the System Can Generate Energy | Fatigues |
| Anaerobic Alactic  ATP-CP | Adenodine DiPhosphate (ADP) and Creatine Phosphate (CP) combine to create immediate energy | Immediate source of energy – lasts only 10-20 seconds. Starts all movements. Used for immediate, quick movements. | Runs out of fuel quickly and must rest to replenish the ADP/CP stores |
| Without Oxygen | Uses \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ only as source of producing ATP.  One gram of carbohydrate will create \_\_\_\_\_\_\_\_\_ATP molecules. NOT EFFICIENT! Lactic acid, water, carbon dioxide byproducts of this reaction. |  |  |
| With Oxygen | Uses \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_ for fuel.  One gram of carb will create\_\_\_\_\_\_\_\_\_\_\_\_\_ ATP molecules. PRETTY EFFICIENT!  One gram of fat will create up to \_\_\_\_\_\_\_\_\_ ATP molecules! MUCHO EFFICIENT! |  |  |