

Carbohydrates

- Carbohydrates role
 - Fuel for activity
 - Immediate fuel for activity
 - Sustained energy for aerobic activity
 - Major energy for high intense activity like weight training or sprinting
 - Protein sparer - nervous system uses carbohydrates
 - Lack of carbohydrates causes protein to go through gluconeogenesis (conversion of protein to glucose) and be metabolized
 - Carbohydrates are metabolic primers, they are needed to completely burn fat
 - Incomplete combustion of fat will result in ketone bodies
 - Fat burns in the flame of carbohydrates.
 - Carbohydrates are the primary fuel for the CNS.
 - Acute carbohydrate depletion may cause tunnel vision, nausea, irritability
- Recommendations for athletes or physically active
 - 50%-60% of calories should be carbohydrates
 - 40%-50% from complex carbohydrates
 - 10% from simple sugar
 - Carbohydrate feedings during long duration (> 90 min.) sub maximal (<70% VO₂) can improve endurance performance (Coyle E & Montain S, 1992; Maughan R, 1991).
 - Carbohydrate ingestions of 30 to 60 grams per hour are required to improve performance
- Too little carbohydrates
 - More fat utilized as fuel source
 - Endurance can be reduced up to 50% until body adapts
 - [Glycogen](#) stores become depleted (Costill and Miller, 1980)
 - Ketosis: Break down of protein (muscle wasting) and incomplete combustion of fats (ketone bodies)
 - Possible symptoms: weakness, dizziness, tunnel vision, fatigue, panting, abnormal EEG, strange breath
 - Possible symptoms in diabetics: unconsciousness, coma and even possibly death in rare cases
 - Blood acidosis may impair exercise tolerance and performance.
 - Body can adapt and convert dietary protein to carbohydrates via gluconeogenesis
 - If low carbohydrate diet is coupled with insufficient dietary protein or calories
 - risk of burning lean tissue (muscle) by gluconeogenesis
- Too many carbohydrates
 - Converted to fat and stored
 - Increases body fat by suppressing fat oxidation
- Glycemic Index
 - High glycemic indexed food should be eaten with other foods
 - Soluble fiber, fat, acidic foods, and protein (particularly meat) significantly blunts insulin spike
 - Keep blood sugar stable
 - Inhibit hunger shortly after meal or snack