

# The Basics

- The body's primary source of energy
  - Muscles use carbs for fuel
  - The brain uses them (glucose) exclusively
- All carbohydrates provide 4 calories/gram



# “Simple” Carbohydrates

- These are known as the “building blocks” of carbohydrates
  - Monosaccharides
    - glucose, fructose, galactose
  - Disaccharides
    - maltose, lactose, sucrose

# “Complex” Carbohydrates

- Formed when 3 or more glucose molecules combine
- Simple and complex carbs have different digestion times and nutrient profiles
  - Each plays a role in the diet

Complex Carbs



Simple Carbs



# Functions of Carbs

- Primary function of carbs is for energy
- Brain, red blood cells, and parts of the eye rely exclusively on carbohydrates
- Carbs also provide the majority of energy production during rest and during exercise (particularly higher intensity exercise)

# Using Stored Carbs

- Carbs are stored in muscles and liver as glycogen:
  - ~300-400 calories worth in the liver
  - ~1200-1600 calories worth in the muscles

**1 "Handful"**  
**Carbohydrate**

Brown rice  
Sweet potato  
Whole grain tortilla  
Whole grain bread  
Beans

**1 "Handful"**  
**Protein**

Fish      Beef  
Pork    Chicken  
2 Eggs   Turkey

**Fruits/Veggies**

Apples  
Bananas  
Oranges  
Berries  
Spinach  
Collards  
Kale

# Carbs in the Athletes Diet

- Sources include:
  - Fruits, veggies, grains, beans, and dairy
- Each have unique benefits and variety is key
- Whole grains, fruits and veggies should make up the bulk of carbohydrate intake
- Simple carbs can play a role too



# Making Carb Choices

- Nutrient density - most nutrients for least amount of calories is best
- Digestion time - how long will the food take to digest pre, during, and post activity?
- Personal tolerance - carbs are digested differently due to things like fiber. Athletes need to understand their bodies



## How Much?

- Data suggests athletes should be eating around 45-65% of their calories from carbs
  - American Dietetic Association and American College of Sports Medicine suggest: 6-10 grams/kg body weight (or 2.7 - 4.5 grams/lb of body weight)
- This will provide optimal fuel for working muscles during demanding activity

# Nutrient Timing

## Pre-, During-, Post

- **Pre** - 1-2 hours before activity, meal (or shake) should be higher in carbs, lower in protein and fat
- **During**: While shorter (<60 min) do not require special fueling tactics, longer bouts do
- **After**: Glycogen needs to be replenished

# Nutrient Timing

## Pre-, During-, Post

- Post: Research indicates 1.0-1.5 gram carbs/kilogram (0.5-0.7 gram carbs/pound) + some protein
- These carbohydrates should be “simple” carbohydrates so they’re stored more quickly
- Protein needs to be combined with this recovery meal (discussed later)

# Summary

- Carbs are the primary source of fuel
- Differentiate between “simple” and “complex” carbohydrate
- Data suggests athletes need higher amounts of carbs than non-athletes (around 45-65%)
- Eating carbs around a workout can boost performance