



# MACRONUTRIENT FOUNDATIONS

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## Carbohydrates are FUEL



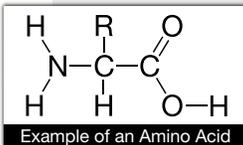
- Carbohydrates are the main source of energy for an athlete's body & brain.
- Carbohydrates help athletes maintain intensity, prevent muscle breakdown, and assist in maintaining hydration.
- Some carbohydrates provide a quick source of fuel (white bread/rice/pasta, pretzels, sports drinks, applesauce).
- Other carbohydrates fill your fuel stores for later use (oats, whole grain bread/rice/pasta, low-fat granola).

- When carbohydrate intake is too low, energy levels, strength, stamina, and decision-making may suffer during workouts. This may lead to poor performance and increased injury risk.
- As an athlete, consuming adequate carbohydrates at appropriate times can make a big difference in training, performance, and overall athletic success.



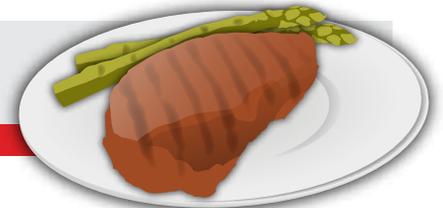
## Protein is STRUCTURE

- Protein plays a big role in keeping the body functioning properly, and a healthy, nourished body is one that can perform at the highest levels.
- In our bodies, protein makes up tissues (including muscle), enzymes (which help facilitate reactions in the body, e.g., metabolism of food into usable energy), hormones (your body's messengers), antibodies (for proper immune function), and much more.



- Proteins are made up of building blocks called **amino acids**.
  - There are 20 amino acids; 9 are essential, meaning you need to get them from your diet.
  - Essential amino acids are critical in athletic recovery and muscle building.

- Protein is most effectively used when spread throughout the day, rather than in 1 or 2 large meals.
  - Give your body 4-5 separate doses of protein throughout the day. Have a source of protein (meat, poultry, seafood, dairy, eggs, tofu, nuts, etc.) with every meal or snack.
- Post-exercise is an important time for protein. **Recovery nutrition** is important within 45-60 minutes after a workout, but also throughout the next 24-48 hours.
- Protein takes a bit longer than carbohydrates to digest and can help one feel full longer, which may assist in weight loss.





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## Fat is ESSENTIAL

- Fat is an essential component for athletes striving for a quality performance diet.
- **The many functions of fat:** maintain body temperature, support immune function, cushion and protect organs, facilitate nerve transmission, assist in vitamin absorption, and provide a source of energy for long-term, low intensity aerobic activities.

### TYPES OF FATS:

- **Unsaturated fats**—found in foods like olive/canola/peanut oils, nuts, avocados, fatty fish, eggs, seeds.
  - May help keep cholesterol and blood pressure low.
  - Omega-3 fatty acids—unsaturated fats linked to reducing inflammation and supporting brain health (and potentially decreasing concussion risk and/or symptoms).
- **Saturated fats**—found in foods such as dairy foods, fatty cuts of meat, chicken skin, margarine, deep fried fast foods, commercially baked pastries/pies, biscuits.
  - Increased intake of saturated fats may contribute to: elevated cholesterol, risk of heart disease/stroke, and inflammation in the body.



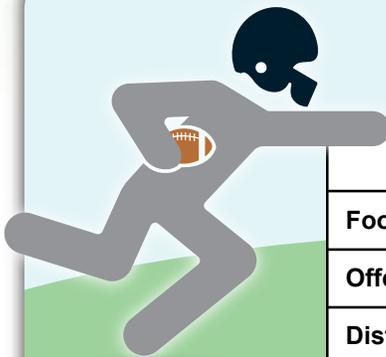
## CHOOSE UNSATURATED FATS MORE OFTEN THAN SATURATED FATS

When fitting foods into your performance diet, remember:

- Too little fat may contribute to low energy levels during aerobic exercise, compromised immune function, inconsistent menstrual cycles in women, and inefficient digestion of certain nutrients.
- Too much fat can contribute to inadequate intakes of the other macronutrients, undesirable weight gain, and health issues such as heart disease.

### SPORT-SPECIFIC MACRONUTRIENT NEEDS

Macronutrient needs vary depending on the sport, position, season of competition, and intensity and length of exercise, as well as the athlete's height, weight, sex, age, and body composition goals. Below are some examples of how macronutrient needs differ between sports:



	CHO	PRO	FAT
<b>Football Wideout</b>	6-10g/kg BW	1.4-2.0g/kg BW	Balance to meet remaining energy needs after CHO + protein needs are met
<b>Offensive Lineman</b>	4-8g/kg BW	1.4-2.0g/kg BW	Balance to meet remaining energy needs after CHO + protein needs are met
<b>Distance Runner</b>	6-12g/kg BW	1.2-2.0g/kg BW	Balance to meet remaining energy needs after CHO + protein needs are met
<b>Wrestler</b>	5-8g/kg BW	1.2-2.0g/kg BW	Balance to meet remaining energy needs after CHO + protein needs are met

*Note: Football players' needs will vary depending on the season – training camp, in-season, off-season. Distance runners' needs will vary during a taper, heavy training or shorter vs longer distances. Wrestlers' needs will vary depending on where they are in their season, how far above their weight class they are, and how close they are to the minimal allowed body fat before certifications.*

Reference:

1. Stuart M. Phillips & Luc J.C. Van Loon (2011) Dietary protein for athletes: From requirements to optimum adaptation, *Journal of Sports Sciences*, 29:sup1, S29-S38