Sports Nutrition

Sports Leadership Camp Workshop

MACRONUTRIENTS

Carbohydrates

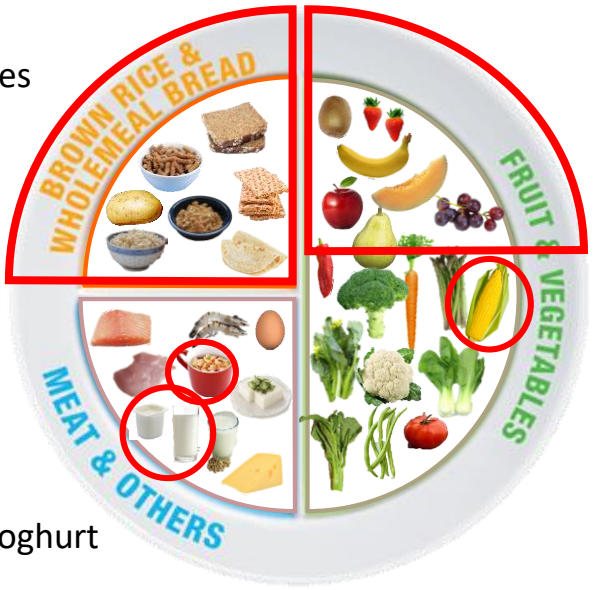
Fat

Protein

Yields more energy per unit of oxygen consumed compared to the other nutrients

Sources of Carbohydrate

Starches



All fruit

Starchy vegetables
(corn, peas)

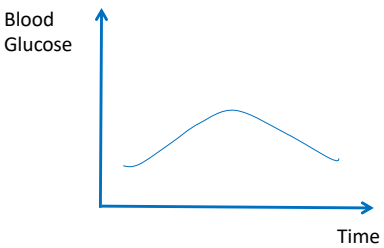
Beans & Lentils

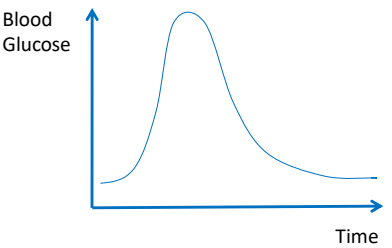
Milk & yoghurt

Carbohydrate

Starches

Sugars





CHO recommendations for athletes

ACUTE FUELING STRATEGIES:

Category	Situation	CHO target
General fueling up	Preparation for events <90 min exercise	7-12 g/kg/24 h as for daily fuel needs
Carbohydrate loading	Preparation for events >90 min of sustained/ intermittent exercise	36-48 h of 10-12 g/kg body weight/24 h
Speedy refueling	<8 h recovery between 2 fuel-demanding sessions	1-1.2 g/kg/h for first 4 h then resume daily fuel needs
Pre-event fueling	Before exercise >60 min	1-4 g/kg consumed 1-4 h before exercise

*Chose familiar food, no new food

Position of Academy of Nutrition and Dietetics, Dietitians of Canada, and the American College of Sport Medicine: Nutrition and Athletic Performance (2016)

CHO recommendations for athletes

DURING EXERCISE:

	Situation	CHO target	Comments on type and timing of carbohydrate intake
During brief exercise	<45 min	Not needed	
During sustained high intensity exercise	45-75 min	Small amounts, including mouth rinse	• A range of drinks and sports products can provide easily consumed carbohydrate • The frequent contact of carbohydrate with the mouth and oral cavity can stimulate parts of the brain and central nervous system to • enhance perceptions of well-being and increase self-chosen work outputs
During endurance exercise, including "stop and start" sports	1-2.5 h	30-60 g/h	• Carbohydrate intake provides a source of fuel for the muscles to supplement endogenous stores • Opportunities to consume foods and drinks vary according to the rules and nature of each sport • A range of everyday dietary choices and specialized sports products ranging in form from liquid to solid may be useful • The athlete should practice to find a refuelling plan that suits his or her individual goals, including hydration needs and gut comfort
During ultra-endurance exercise	>2.5-3 h	Up to 90 g/h	• As above • Higher intakes of carbohydrate are associated with better performance • Products providing multiple transportable carbohydrates (Glucose:fructose mixtures) achieve high rates of oxidation of carbohydrate consumed during exercise

Position of Academy of Nutrition and Dietetics, Dietitians of Canada, and the American College of Sport Medicine: Nutrition and Athletic Performance (2016)

Protein Recommendation for Athletes

- Endurance athletes : 1.2-1.4 grams of protein per kg of body weight per day
- Resistance and strength-trained athletes 1.2-1.7 grams protein per kg of body weight.

Protein Recommendation for Athletes

After exercise

- 20 to 25g protein/meal across the typical range of athlete body sizes (provides ~ 10g EAA) in early recovery phase, also called as "anabolic window" (0-2hours after exercise)
- Higher dose of >40g dietary protein have not shown to increase MPS
- Current studies suggest that increases in muscle strength and mass are greatest with immediate post-exercise provision of protein
- More research needs to be done on protein timing affects MPS rates, magnitude of mass and strength changes over time

How much protein in your food?

1matchbox (30g)
7g protein

1 large egg (60g)
7g protein

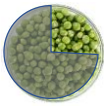
¼ cup lentils (cooked)
4g protein

¼ cup beans (cooked)
4g protein

1/3 block tofu
5g protein

1 slice chees (21g)
4g protein

1 cup milk (250g)
8g protein



¼ cup peas
2g protein

¼ cup edamame, shelled
5g protein

½ piece hard tofu
12g protein

1 small tub yoghurt (140g)
6g protein

½ cup cottage cheese
12g protein

2 Tablespoons peanut butter
8g protein

1 Oz nuts (28g)
6g protein

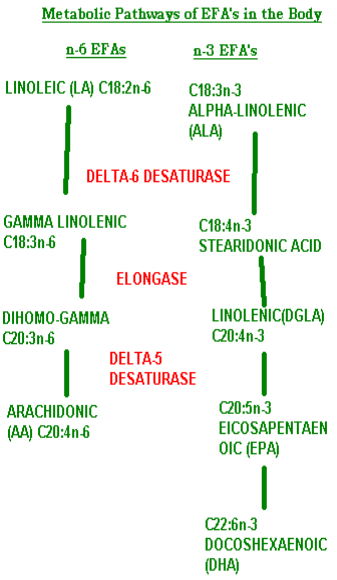
Essential FAs

Role:

- Structural membrane lipid
- Regulation of gene expression
- Cell signaling
- Associated as pro-inflammatory agents

Main sources:

- Sunflower seeds
- Corn
- Safflower
- Wholegrains
- Cereals

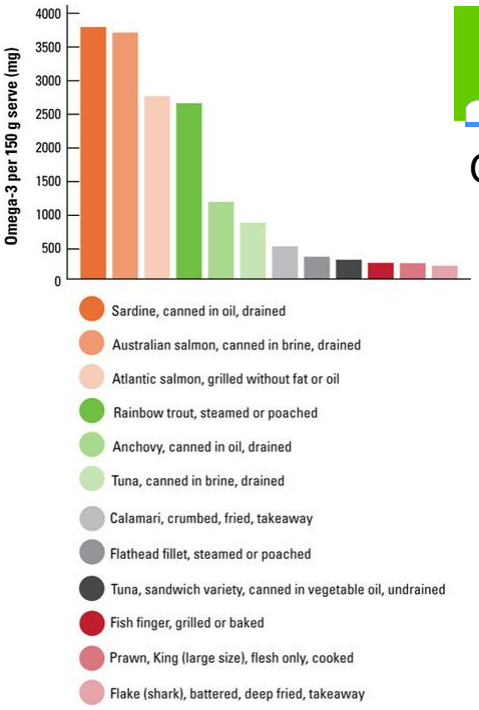


Role:

- Structural membrane lipid particularly in brain, nerve tissue and retina
- Cardiovascular and anti-inflammatory benefits

Main sources:

- Oily fish
- Legumes
- Canola oils
- Margarines
- Linseed oils
- Walnuts
- Omega 3 eggs



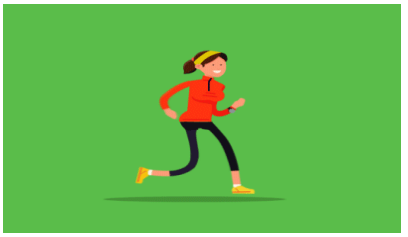
choice "CHOICE it" before you buy it

products | babies & kids | computers | money | food

Omega 3 food sources

Where is cod fish?

- It's a white fish e.g. cod fish, whiting
- Only contains oil at the liver



CHO	✓	✓	✓
Fat	✓		
Prot			✓
Fluid	✓	endurance/ intermittent exercise >60min or sustained high-intensity exercise >45min	✓

Importance of hydration

- Fluid provides the aqueous medium for chemical reactions and other processes within cells, transport substances throughout the body, facilitates thermoregulation (maintenance of body temperature)
- Fluid replacement during exercise helps in heat removal through the process of sweating
  - Ingestion of fluid during exercise increases blood skin flow (helps in thermoregulation)
  - The body cools off body via evaporation of sweat from skin

Exercise (metabolic processes produce heat)
↓
Increased core temperature
↓
Excess heat dissipated to maintain optimal body core temperature
↓
Increases blood flow to the skin
↓
Initiates sweating

Hydration Guideline

Before exercise

Optimal hydration =
Accurate measurement of hydration status
+
Correct quantity of fluid
+
Correct timing of ingestion

- 5 to 10ml/kg BW in 2 to 4hours before exercise
- Aim to achieve urine that is pale yellow in colour, allow sufficient time for excess fluid to be voided
- Sodium in food/drink may help with fluid retention and stimulate thirst sensation
- Drinking several hours before exercise gives sufficient time for urine output to return to normal

Hydration Guideline

Aim <2% of body fluid deficit

During exercise

- Fluid intake of 0.4 to 0.8L/hr, depending on athlete's tolerance and experience, opportunities for drinking fluid and benefits of consuming other nutrients (e.g. CHO) in drink form
- Consider:
  - Small volume 150-200ml every 15-20min (0.5-2L/hr) to match fluid consumption with sweat and urine output
  - Cold beverages – can reduce core temperature → improve performance in the heat
  - Presence of flavor in the beverages – increase palatability and voluntary intake
- To note, recreational athletes tends to drink exceed their sweat loss → overhydration → hyponatremia (plasma sodium <135mmol/L)/ water intoxication

Hydration Guideline

After exercise

- Replacing water, electrolytes & CHO lost during exercise aids in recovery
  - Cardiovascular, thermoregulatory, other metabolic processes
- Presence of CHO + sodium in rehydration drink or food enhances the rehydration process
- Sweat losses and obligatory urine losses continue during the post exercise phase → intake of greater volume of fluid (e.g. 125% to 150% than the final fluid deficit (e.g. 1.25 to 1.5 L fluid for every 1 kg BW lost)
- Athletes need to begin drinking fluids immediately or within 2 hrs. post-exercise. Small sips help the stomach gradually handle more volume
- Athletes should continue to hydrate gradually and consistently till urine returns to a clear or pale colour (within 1% of baseline weight)

Weight management in Sport

- Weight management / modifying body composition to boost performance
  - Achieve a pre-designated weight to compete in a specific weight class
  - Increase lean body mass (may add speed, power, agility)
  - Depends on type of sports, position played
  - strength-to-weight ratio (more power per pound)
  - Lesser time clocked in for long distances
- No set standards or ideal body composition levels for various sports
  - Typical range for athletes: 5-10% (M), 12-15% (F)

Appropriate Nutrition + **Appropriate Exercise**

The Athlete's Plate