THE BALANCED DIET: THE FOUNDATION FOR SPORT NUTRITION

WHAT is the balanced diet?

A balanced diet includes the proper amounts of macro and micronutrients plus fluids needed to provide the required energy to train, compete, recover and for overall health and wellness [6].

BASIC MATH: To optimize performance an athlete must consume enough calories to offset energy expended.

Energy In (Nutrition) > Energy Out (Exercise)

Energy Needs:

- General Fitness: 30-40min/ day, 3 times a week = normal well-balanced diet (25-25kcals/kg/day)
- Moderate levels of intense training (Jr. Hockey Player): 2-3hrs/ day, 5-6 times a week (600-1200kcals/ hour) = performance diet (50-80kcals/kg/day)

*Endurance athletes need to consume as high as 12,000kcals/ day

*Larger athletes may range from 6,00-12,000kcals/ day depending on training volume and load [1]

WHY is a balanced diet important?

Athletes need to consume adequate energy to maximize training effects.

Low energy intakes can result in:

- Weight loss (including muscle mass)
- Loss of or failure to gain bone density
- Increased risk of fatigue, injury, and illness
- Induce symptoms of over-training
- Prolonged recovery process [1][3]

A balanced diet (quality, structure, timing of intake) helps athletes:

- Train more effectively which can reduce the risk of injury and sickness.
- Improves the quality of training and recovery and can induce metabolic adaptations to training [4]

An athlete can optimize his/ her performance with nutrition by ensuring he takes in the adequate amount of energy in his diet compared to the amount of energy expended, which can be called an *energy balance*.

THE NUTRITION ELEMENTS

WHAT ARE MACRONUTRIENTS?

CARBOHYDRATES (CHO)

- The majority of dietary carbohydrates should come from complex carbohydrates with a low to moderate glycemic index (e.g. whole grains, vegetables, fruit) [1].
- Suggested Intake: 30-70grams of CHO/ hr during exercise for a 50-100kg athlete [1].

PROTEIN (PRO)

- Not all protein is alike, athletes need to ensure they are getting high quality protein and understand how different types (casein, whey) are digested at different rates [1].
- General fitness: 0.8-1.0g/kg/day
- Moderate intense training: 1-1.5g/kg/day
- High Volume intense training: 1.5-2.0g/kg/day
- *Hockey Player: 50-225g/day for a 50-150kg athlete

FAT

- Fat intake for athletes is not much different than non-athletes (25-35% of total calories) but a small increase in fat (up to 50%) can be beneficial for athletes involved in high volume training [1].
- It is recommended to consume one-third saturated fat, one-third mono-unsaturated fat, and one-third polyunsaturated fat. Avoid trans fats [6].

WHAT ARE MICRONUTRIENTS?

Micronutrients play an important role in:

- Energy production
- Regulate metabolic processes
- Hemoglobin synthesis
- Maintenance of bone health
- Immune function
- Antioxidant protection against free radicals [6]

VITAMINS

- There are two types of vitamins: fat and water soluble. The fat soluble vitamins include vitamins A, D, E, & K. The body stores fat soluble vitamins and therefore excessive intake may result in toxicity. Water soluble vitamins are B vitamins and vitamin C. Since these vitamins are water soluble, excessive intake of these vitamins are eliminated in urine, with few exceptions (e.g. vitamin B6, which can cause peripheral nerve damage when consumed in excessive amounts)[1].

MINERALS

- When athletes are deficient in some minerals, like iron, sodium or calcium, adaptations from exercise can be compromised [1].
- Experts say, "Minerals are essential inorganic elements necessary for a host of metabolic processes. Minerals serve as structure for tissue, important components of enzymes and hormones, and regulators of metabolic and neural control " [1].

MICRONUTRIENTS THAT IMPACT PERFORMANCE [2,11]

VITAMINS

Vitamin C (RDA: Males 90mg/d, Females 75mg/d) Vit C is used in a number of different metabolic processes in the body. It is involved in the synthesis of epinephrine, iron absorption, and is an antioxidant. Theoretically, it could benefit exercise performance by improving metabolism during exercise. There is also evdence that vitamin C may enhance the immune system.
Sources: Citrus fruit, tomatoes, broccoli, red peppers

Vitamin D (RDA: 5mcg/day) Promotes bone growth and mineralization. Helps with calcium absorption.
Sources: Tuna, salmon, soy milk, eggs

Vitamin E (RDA: 15mg/d) As an antioxidant, it has been shown to help prevent the formation of free radicals during intense exercise and prevent the destruction of red blood cells, improving or maintaining oxygen delivery to the muscles during exercise.
Sources: Nuts, seeds, avocado, wheat germ, cooked spinach, canned tomatoes, eggs

MINERALS

Calcium (RDA: 1000mg/d) Calcium supplementation has not been proven to provide an ergogenic effect on exercise performance but has been shown to promote fat metabolism and help manage body composition.
Sources: Broccoli, Kale, Fortified orange juice, daily products, soybeans

Iron (RDA: Males 8mg/d, Females 18mg/d) Iron does not appear to improve performance in athletes unless the individual is iron-depleted and/ or has anemia.
Sources: Spinach, potatoes, oatmeal, red meat, poultry

Sodium (RDA: 500mg/d) Increasing salt availability during heavy training in the heat has been shown to help maintain fluid balance and prevent hyponatremia.

Zinc (RDA: Males 11mg/d, Females 8mg/d) Studies indicate that zinc supplementation (25 mg/d) during training minimized exercise-induced changes in immune function.
Sources: Wheat germ, beef, liver, baked beans, oysters

WATER

THE most important ergogenic aid over any other is water. If you loose more the 2% of your body weight (during exercise) it can have a large impact on performance [1].

WHEN: TIMING IS EVERYTHING

BEFORE

- Ensure adequate carbohydrate fuel in the body. Eat a pre-training/ pre-game meal rich in carbohydrate 1-4 hours before activity
- Begin hydrated!

DURING

- Replace fluid & electrolytes lost in sweat
- Include a carbohydrate rich drink to maintain performance
- "Carbohydrate intake during exercise, in the form of sugars, can help maintain performance levels in 'stop and go' activates", Dr. John Davis [5].

AFTER

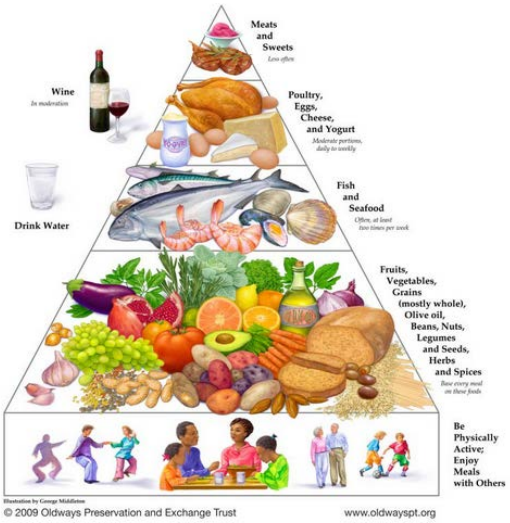
- Have protein within 30min of exercise to help repair muscles (approx. 20g)
- Include carbohydrates in post-game meal to replenish muscle & liver glycogen
- Drink fluids to rehydrate (in the case of high intensity training, add electrolytes to your water intake

HOW: THE DIFFERENT TYPES OF BALANCED DIETS

There are many different types of diets around the world that differ from the typical North American Diet, and many athletes are choosing unconventional nutrition plans to meet their performance needs. Each athlete is unique; personal tastes, cultural background, allergies, and intolerances all play a factor in how athletes choose to eat. The important elements in choosing a diet is a) ensuring you enjoy the food you are eating and b) you are getting the energy needed for optimal performance. Here are a few examples of different types of diets.

Mediterranean Diet

The biggest difference between the Mediterranean diet and the North American diet is the larger presence of fish and seafood. This eating pattern has been call the 'gold standard' and is known to promote lifelong good health [7]

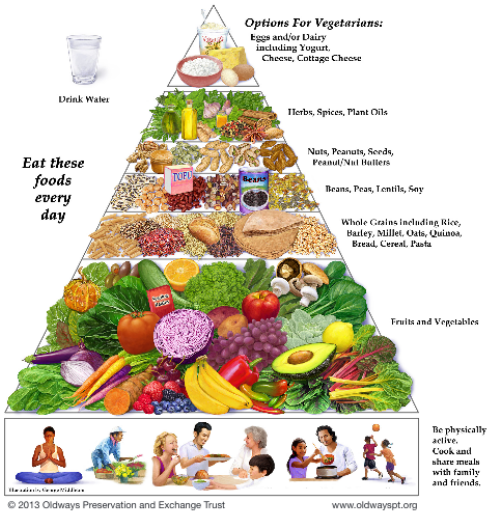


Asian Diet

1. Asia is known for its low incidence of chronic diseases, therefore has become a popular diet to follow [8]. The Asian diet does not include a large amount of dairy and rice is the typical carbohydrate used in many meals.

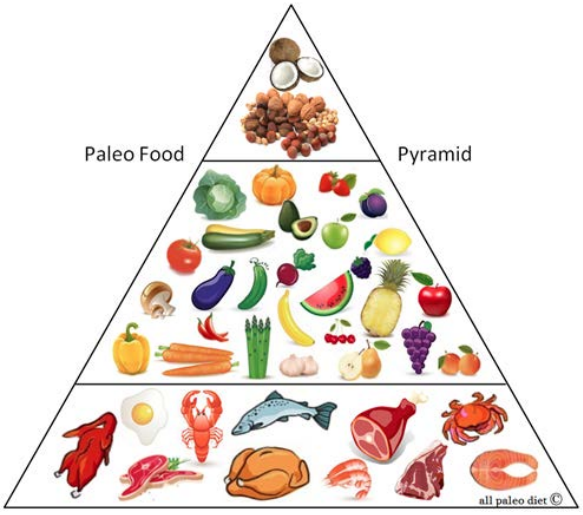
Vegetarian/ Vegan Diet

The vegetarian athlete needs to rely on non-animal based food to ensure he/she gets the protein needed to rebuild and recover after exercise. Vegan athletes are even more limited in food sources but many athletes have had great success on a vegan diets.



Paleo Diet

The Paleo or Paleolithic Diet is a very popular diet right now, it is based on the hunger-gatherer diet of our ancient ancestors. It is an elimination diet that avoids grains, dairy and all sugar. The majority of a Paleo athelte's energy comes from meat and vegetables, nuts and seeds, some starch [9].



GOOD SOURCES OF PROTEIN [10]

*Each portion outlined has 25g of protein

Egg (whole)	3 eggs
Yogurt (fruit)	2 cups
Milk	3 cups
Cottage cheese	1 cup
Chicken breast	3oz.
Ham	3oz.
Tuna (canned)	3ox. (1 can)
Roast beef/ Steak	3oz.
Beans	2 cups
Whey Protein Powder	30g (1 scoop)

3oz. is about the size of a deck of cards or the palm of your hand.

GOOD SOURCES OF CARBOHYDRATES [10]

*Each portion outlined below has 30g of carbohydrate

Rice, cooked	1/2 cup
Quinoa, cooked	3/4 cup
Cereal, hot/ cooked	1 cup
Kashi Granola Bar	1.5 bar
Banana	1 medium
Applesauce	1 cup
Fruit Smoothie	8oz
Sweet potato	1 cup
Milk (regular)	2 cups
Milk (chocolate)	1 cup
Yogurt (fruit)	3/4 cup
OJ or Apple juice	2 cups

Sample In-Season Meal Plan:

8am Breakfast:
- Scrambled Eggs (3 whole eggs) with onion, mushrooms, peppers
- Whole grain toast
- Bowl of berries

10am Snack
- Greek yogurt with banana

12pm Lunch
- Salad with beets, cucumber, tomatoes, red peppers with vinaigrette dressing, light cheese
- Chicken breast
- Quinoa

2pm Snack/ Pre-Training Meal
- Smoothie with milk and fruit

5pm Post Training Snack
- Chocolate milk or Protein Shake

6:30pm Dinner
- Grilled veg and beef kabobs
- Baked yams
- Milk

REMEMBER TO EAT EVERY 2-3 HOURS

CANDY'S PROTEIN DROPS

INGREDIENTS

1 cup	large whole oats
1/2 cup	nut butter
1/2 cup	honey
1 cup	coconut flakes
1/2 cup	ground flaxseed
1 tsp	vanilla
1/2 cup	coco chips
1/4 cup	coco powder
1/3 cup	nuts (chopped)
1/3 cup	dried fruit (optional)

Mix all ingredients with clean hands. Roll into balls or any shape you would like. Refrigerate. Enjoy anytime after drops have formed.

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Mediterranean, Asian & Vegetarian/ Vegan Pyramids: Why Pyramids are Important, Oldways: Health Through Heritage, http://oldwayspt.org/resources/heritage-pyramids/why-pyramids-are-important

Paleo Pyramid: Paleo Foods to Eat & Avoid, http://www.allpaleodiet.com/what-is-the-paleo-diet/paleo-foods-to-eat-and-avoid/