

Nutrition for Competitive Swimmers

Eating enough to fuel your body

Calories are a unit measuring the amount of energy coming from food.

- Just like a kilometre measures distance, calories measure energy.
- Every cell in our body requires energy to function. Your body is like a car that never turns off, so it needs gas frequently to keep running well.

Eating enough calories helps you swim faster, recover quicker, grow, and keeps your body happy.

- The more training you do, the more calories you will need to eat.

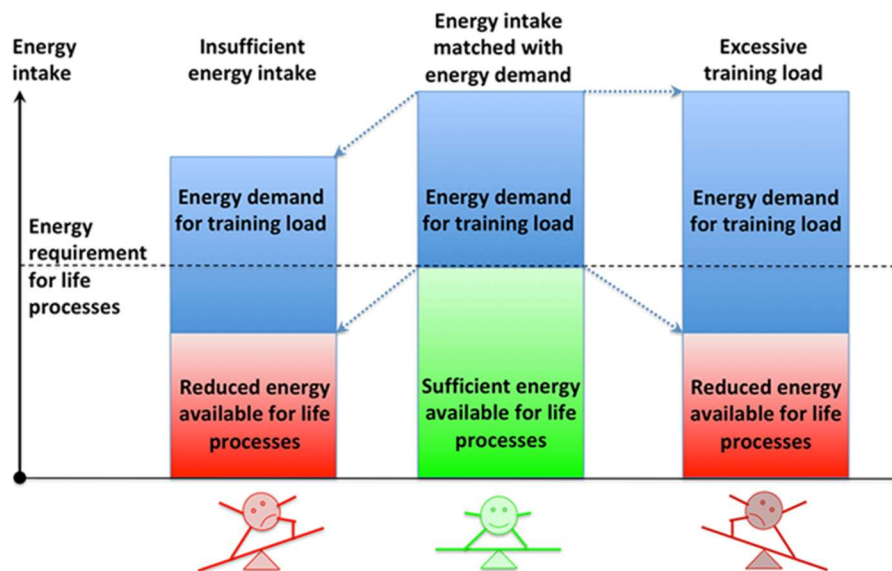
If you consistently do not eat enough for your training and daily living needs, you may develop Relative Energy Deficiency in Sport (REDs). This can occur in both males and females.

- Swimmers are at a higher risk for developing REDs due to the multiple hours you train a week.

The energy your body needs daily for life processes occurs over a 24-hour period, but your training occurs within a 1-3-hour period.

- Therefore, your training will always take the energy it needs, since it happens over a shorter time.

This means that if you do not eat enough during the day to cover both, you will not have enough energy for your daily living needs and are at risk for developing REDs.



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Signs and symptoms of not eating enough*:

- Excessive fatigue
- Frequent injuries or illnesses
- Stress fractures
- Irregular menstrual cycles or lack of a cycle
- Hair loss
- Feeling cold all the time
- Mood changes
- Poor sleep
- Constant hunger
- Frequent gut issues
- Find it difficult to concentrate

Not eating enough affects on performance:

- Decreased endurance
- Decreased speed
- Decreased strength
- Decreased coordinator
- Decreased concentration
- Increased risk of injury

Not eating enough affects on health:

- Poor growth and development
- Hormonal dysfunction
- Heart abnormalities
- Low immunity

**If you have any of these signs and symptoms, please see your doctor for a check-up.*

So how many calories do you need?

- Since everyone is different, and your needs change as you grow. If you do not have any of these symptoms, you are likely eating enough for your swim training and daily living.
- As a swimmer, you will need to eat more than your non-athletic friends and even some adult family members.

Not only do you need to eat enough calories to be a successful swimmer, you also need to eat enough of all the macronutrients that make up our calories.

Three macronutrients make up our calories – carbohydrates, protein, and fat.

Carbohydrates are the body's preferred source of energy as it is quick to use, and helps keep your gut happy.

Carbohydrates include sugar, starch, and fibre.

- Sugars and starches fuel your muscles, brain, and organs.
 - They can be stored in your liver or muscle as glycogen.
 - Glycogen helps fuel your muscles and organs when you are sleeping and when you are training.
- Fibre helps feed your good gut bacteria and helps prevent diarrhea and constipation.
 - Fibre does not provide any energy to your body.

Protein is the body's building blocks.

- Every cell in your body requires protein to be built or repaired. Your body is continuously rebuilding itself, especially when you sleep.
- Your body cannot store protein, so you need to eat it every day. If you do not eat enough protein, you will lose your muscles as they will be used for cell rebuilding and repair.

Fat provides your body with energy, improves your brain function, keeps you warm, and helps build your cells and hormones.

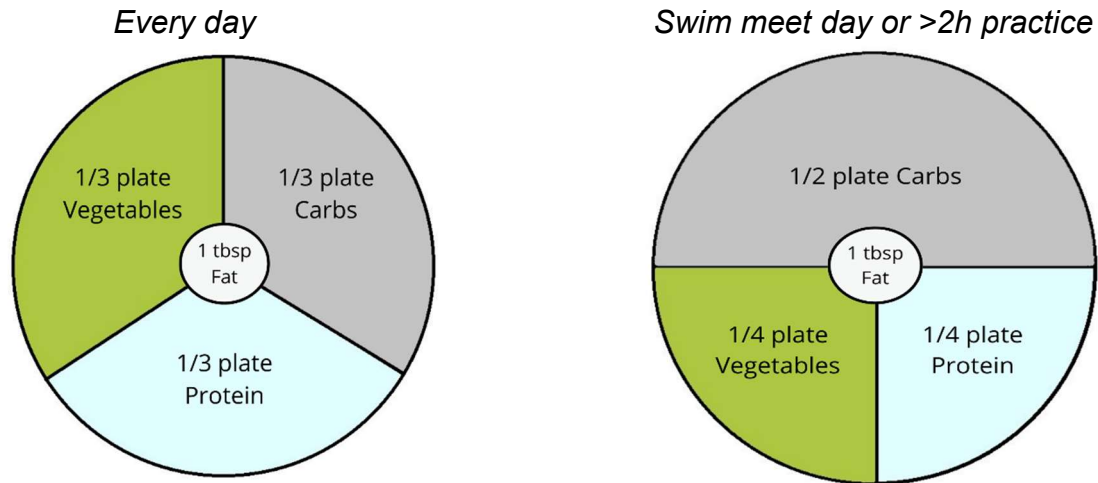
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Athlete Plate Guidelines



See the appendix for a list of foods that contain each macronutrient to help you build your plate.

Important Vitamins and Minerals

Water

Water is needed for every function of your body, including helping make energy.



When you are swimming, you are sweating, even if you don't feel like it. If you do not drink back the water you have lost, you develop a condition called dehydration.

- Signs of dehydration include thirst, fatigue, muscle weakness, poor performance, difficulty concentrating, and difficulty regulating body temperature.

If you are 9 to 13 years old, you need 5 to 6 cups of water per day.

If you are 14 to 18 years old, you need 6 to 8 cups of water per day.

Plus, you need an additional 1-2 cups of water per hour of swim practice to replace any water lost through your sweat.

Sodium, Potassium, and Magnesium

Electrolytes are a group of minerals (sodium, potassium, and magnesium) that are needed to keep your muscles contracting and your cells in balance.

- Sodium and potassium are needed for muscle contraction
- Magnesium is needed to relax the muscles and make ATP, our energy molecule.



Swimmers are at a higher risk of low electrolytes due to heavy sweating or drinking too much plain water during longer practices.

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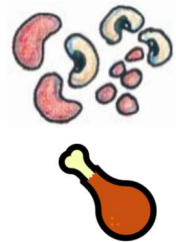
If you have low electrolyte levels or if your electrolyte balance is off, you may experience muscle weakness, twitches, cramps, light-headedness, headaches, blurred vision, nausea, irregular heartbeats, or fatigue.

You need between 1500-2300 mg of sodium, 2300-3000 mg of potassium, and 360-410 mg of magnesium per day. Here are some food to help you get your electrolytes:

- Sodium: table salt (table, kosher, Himalayan salt), seasonings, salted nuts, packaged, canned, and pickled foods
- Potassium: most veggies and fruits, potatoes, whole grain foods, dairy foods, nuts, beans, lentils
- Magnesium: nuts, seeds, tofu, peanut butter, dairy foods, dark green veggies

Iron

Iron is needed to carry oxygen around our body and helps make energy (ATP).



All athletes are at risk of low iron levels.

- Your body naturally loses iron every day due to your red blood cells recycling.
- Athletes who menstruate also lose iron during menses.
- Iron absorption is reduced for 3-6 hours after exercise

Iron is well absorbed when iron-rich foods are eaten with vitamin C foods. Unfortunately, iron is poorly absorbed when eaten with calcium-rich foods. It is best to serve milk and other calcium-rich foods outside of meals, if you can, to promote the absorption of iron.

If you have low iron stores, you may experience fatigue, weakness, lethargy, feeling cold all the time, difficulty paying attention or staying focused, feeling unmotivated, or poor physical and mental performance.

Males and non-menstruating females need 8 mg of iron per day.
Menstruating females need 18 mg of iron per day.

Iron-rich foods include all meats, all fish, all poultry, nuts, beans, lentils, egg yolks, tofu, pumpkin seeds, cooked dark green veggies (broccoli, asparagus, kale, edamame), oatmeal, fortified cereals.

Calcium

While you are growing, you need calcium every day to help you build strong bones. Once you finish growing, your bones continue to rebuild themselves and you need calcium to help with this.



If your diet is low in calcium, you will likely have weaker bones and experience more fractures. If you are between 9-18 years old, you need 1300 mg of calcium per day.

Calcium rich foods include dairy foods, fortified beverages, canned salmon with bones, soybeans, sesame seeds, almonds.

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Vitamin D

Vitamin D helps calcium build and maintain your bones. Normally, you get plenty of vitamin D from the sun. However, in Canada, your body struggles to make vitamin D in the winter months, even on sunny winter days. It is recommended to take a vitamin D supplement containing 600 IU between October to April, once you are 18 years old you will need 1000 IU of vitamin D daily.



Supplements

As a growing swimmer, you likely do not need to take any supplements, unless directed by your doctor, as you will be able to get what you need from food.

- But, sometimes having a supplement can be an easy, to-go option when you are on the road or away at swim meets with limited cooking facilities or food options.

Supplements are not regulated by Health Canada and therefore may contain ingredients that are not listed on the label.

- Since there is no regulatory body forcing them to list everything, some products list “proprietary blend” in the ingredient list. These are not safe for sport as they did not declare what that blend contains, which means there could be banned or harmful ingredients.

As a swimmer, if you take a supplement, it needs to be “safe for sport”. This means that the supplement company has allowed a third-party company to test and verify their product, claims, and ingredients

You can check if a supplement is safe for sport by searching it on these two websites or looking for their logos on products:

<https://www.nsf sport.com/>

<https://choice.wetestyourtrust.com/>



The following are the only supplements I would recommend to athletes*:

- Vitamin D – as discussed above
- Protein powder
 - Helps promote muscle repair and recovery after exercise
 - Best for after swim meets or practices where you have a long drive and will not be eating for a couple of hours
 - Best if in a smoothie that contains fruit or milk rather than plain water to get in the extra calories you need for recovery
- Tart cherry juice
 - Helps reduce muscle soreness and improves sleep
 - Best for those who struggle to get to sleep after a late end to finals
- Electrolyte powders and beverages
 - Helps replenish your electrolytes
 - Best for practices that are longer than 90 minutes
 - Best for those who tend to experience muscle cramping during practice
 - Note that some brands contain different amounts of sodium, potassium, and magnesium, so be sure to read the label
- Any supplement recommended by your doctor based on your lab results



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Eating before, during, and after practice

Before practice

Eating a snack before practice gives your body an energy boost to help you swim well, especially if the last meal was 3 or more hours ago.

It is super important to have a small breakfast before your morning swim practices as your body uses energy while you are sleeping, and so your body is looking for energy in the morning after you wake up.

To help you get the energy you need to swim your best during practice, you want to eat snacks or small breakfasts that are high in carbohydrates, low in protein, low in fibre, and low in fat.

- Carbohydrates are quick to digest and are the best fuel for swimming.
- Protein, fat, and fibre are slow to digest and are better to eat after practice.

Eating too much or too close to swim practice may make your stomach upset as your body struggles to digest food while you are swimming.



Here are examples of what to eat 1 hour before swimming:

- 2 pieces of toast, 1 cup of cereal, 1 bagel, 1 cup of oatmeal, juice, 1 piece of fruit

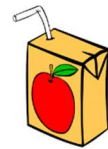
During practice

Most swimmers will only need water during swim practice as practice tends to be 90 minutes or less. Ideally, you need about 1-2 cups of water per 1 hour of swimming to keep you hydrated.

If you are swimming longer than 90 minutes, you may need to have carbohydrates and electrolytes to help you continue to work hard and swim fast.

The best carbohydrate options during swimming are liquid or blended high-carbohydrate foods – sports drink, applesauce pouch, or a juice box.

- Liquid foods are easier for the stomach to digest while swimming.
- Plus, these foods are easy to bring on deck and are relatively mess-free.



You need about 30 to 60g of carbohydrates during long practices over 90 minutes.

- Choose 1 sports drink, 2 applesauce pouches, 2 juice boxes, or 2 fruit gummy packages throughout your practice.
- You want to spread this out over the entire practice

When you first start eating or drinking during practice, you need to eat or drink slowly. If you have too much at one time, you can upset your stomach, as it is difficult for your stomach to digest while swimming.

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For electrolytes, you only need to have them when your practice is longer than 90 minutes. As you lose electrolytes in your sweat, you need to replace them to help you continue to work hard and swim fast.

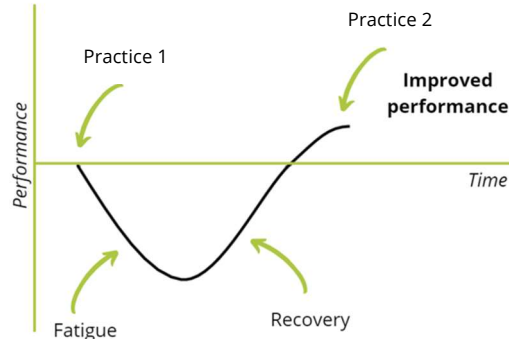


- If you are choosing to have a sports drink, there will be electrolytes already in that beverage.
- If you are choosing a juice box or applesauce pouches, you will need an electrolyte beverage or tablet with your water.

You want to look for items that contain 150-250mg of sodium and 50-80mg of potassium per 1 cup of fluid. Gatorade, Powerade, Biosteel, and Nuun electrolyte tablets all meet these criteria.

After practice

After practice, you want to start recovery right away so that your body comes back stronger for the next swim practice. Recovery includes nutrition and sleep. Eating as soon as you are finished practice will start your recovery.



Protein is needed to repair your muscles. Carbohydrates and fat are needed to fill up your energy tanks.

As well, you also want to drink water to stay hydrated. Many will need 1-2 cups within 1 hour after practice.

Here are some ideas of what to eat within 60 minutes after practice, if you are unable to have a full meal:

- Greek yogurt with berries
- 2 cheese strings with crackers
- Trail mix with dried fruit
- Chocolate milk
- Granola bar and beef jerky
- Smoothie containing fruit and yogurt
- 2 hardboiled eggs and fruit



Eating for double practice days

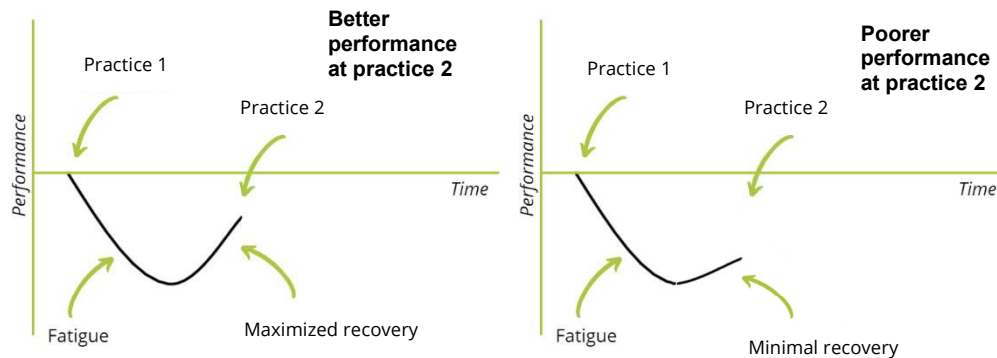
Sometimes you may have two practices in one day – it could be 1 practice in the pool and 1 in the gym or 2 practices in the pool. On these days, your body does not have

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enough time to fully recover between your two training sessions, so your nutrition is even more important.

You want to eat your meals according to the “swim meet” plate listed above so that you have the energy to perform well during both practices. As well, you want to follow the “during practice” recommendations depending on how long each practice is.

Most likely, your second practice of the day will feel the hardest. This is because your body did not have time for a full recovery, so you are starting the second practice with some fatigue. Eating enough between practices will help you maximize your recovery and lessen your fatigue.



To maximize recovery between practices, you want to eat as soon as you can after practice 1 is finished with a focus on carbohydrates, protein, and hydration as mentioned above in the “after practice” section.

You also want to plan when your meal will be between your practices. You likely need 3-4 hours to digest a normal-sized meal. If you don't have that amount of time, you want to have the same “swim meet or 2h practice” plate portions, but in a smaller volume.

About 1 hour before your second practice, you want to have a small carbohydrate snack to give yourself that final boost in energy and 1 cup of water to make sure you are well hydrated.

After your second practice, you want to again eat as soon as you can to start recovery. Focus on carbohydrates, protein, and hydration.

Many swimmers will feel less hungry on double days as exercise may decrease your hunger hormones. This is normal, but you still need to eat. Focus on liquid options, like chocolate milk or a smoothie, so that you are getting the nutrients your body needs.

Eating for swim meets

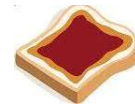
In swimming, 100th of a second is the difference between getting a best time or not. Eating well during swim meets can help you race your best and show off your hard work.

**Breakfast**

You probably won't have a lot of time in the morning between when you wake up and when you are in the pool for warm-up. A large, high protein, high fat, high fibre breakfast may take 4-5 hours to digest. Whereas a small, high carbohydrate breakfast, low fat, low protein, low fibre may take 30-60 minutes to digest.

If you have less than 1 hour between waking up and warming up, eat a small-volume breakfast that is high in carbohydrates, lower in protein, low in fat.

- Examples:
 - toast with peanut butter and jam ;
 - oatmeal ;
 - low-fat greek yogurt and a few berries



If you have 1-2 hours between wake up and warm up, you can follow the plate portion above titled "Swim Meet" as you will have more time to digest a slightly larger meal with protein and fibre.

- Examples:
 - toast with peanut butter, a banana and an egg ;
 - oatmeal with 1 glass of low-fat milk ;
 - low-fat greek yogurt, berries, nut-based granola ;
 - smoothie made with low-fat milk and fruit
 - cereal with low-fat milk and 1 piece of fruit



Ideally, you want to stay away from high-fat, high-protein, high-fibre foods unless you have at least 3 hours to digest them. These include bacon, sausages, doughnuts, pastries – both homemade and fast food options. If you choose to eat these foods during breakfast of a swim meet, your warm-up may feel sluggish and you may experience nausea or an upset stomach.

If you are a swimmer who experiences race day nerves, you want to eat a smaller meal regardless of the time you have to digest it. When you are nervous, your stomach may not be able to handle a larger breakfast meal.

Snacks in between races

Eating throughout a swim meet will help keep your energy up so that you can swim your best. What you eat depends on when your next race is. Here are some suggestions:

15-30 minutes:

- ½ bottle of sports drink
- 1 handful of crackers, pretzels, or gummy bears
- 1 apple sauce pouch
- 1 juice box



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30-60 minutes:

- 1 bottle of sports drink
- 1 piece of fruit (banana, apple, orange, pear, etc)
- Granola bar (low fat)
- 2 rice cakes
- Plus anything from the “15-30 minute” list

1-2 hours:

- ½ to full sandwich (peanut butter and jam ; ham and cheese, etc)
- Low-fat yogurt
- Cheese string with crackers
- Trail mix with dried fruit
- Plus anything from the other lists

If you are a nervous swimmer, aim for the items on the “15-30-minute list” regardless of the time frame. This will still give your body the energy it needs with minimal nausea and stomach upset.

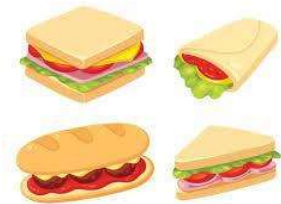
High-fibre foods, such as raw veggies, are not recommended to eat until the swimming session is complete. High-fibre foods take a long time to digest, just like high-protein and high-fat foods, which can increase the risk of upset stomach. Most importantly, fibre does not provide any energy for swimming and is best once your races are finished.

Lunch

Usually, there are a few hours between the morning session and the afternoon session. This is the perfect opportunity to fill up your energy levels and recover a bit so you can swim fast in the afternoon session. You want to eat according to the portions on the plate titled “Swim Meet” for your lunch meal. Remember to drink water during your lunch to rehydrate yourself.

Here are some easy, light lunch ideas:

- Leftover supper from the night before
- Sandwiches or wraps
- Mixed dishes including rice or pasta such as quinoa salad, stir-fry



Remember to drink water during your lunch to rehydrate yourself too.

Supper

Now that your races are done for today, you can eat a larger meal as you will have the time to digest it. Your supper meal is also the time to start recovery and repair, especially if you are racing again the next day, so the sooner you eat it, the better. You want to eat according to the portions on the plate titled “Swim Meet” for your supper meal. Remember to drink water during your supper to rehydrate yourself. See the appendix for supper ideas.

If you are unable to eat supper within 60 minutes after your last swim, follow the “after practice” guidelines for on-the-go snack ideas.



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Appendix

Protein Foods

Beef
Pork
Chicken, turkey
Fish
Wild game
Eggs, egg whites

Beans
Chickpeas
Hummus
Lentils
Tofu
Soy beans

Milk (cow, soy, pea)
Cottage cheese
Greek yogurt
Regular yogurt

Carb Foods

Corn
Potatoes
Pumpkin
Squash
Yam

Bread
Bagel
Bun
Crackers
Cereal
Oatmeal
Pancake
Pasta
Rice
Pita
Popcorn
Waffle

Fat Foods

Avocado
Coconut
Olives

Almonds
Cashews
Hazelnuts
Pecans
Peanuts
Pistachios
Walnuts

Chia seeds
Flax seeds
Pumpkin seeds
Sunflower seeds

Almond butter
Cashew butter
Peanut butter

Butter
Cream
Cheese
Sour cream

Canola oil
Coconut oil
Olive oil
Peanut oil

Fruit

Apple
Apricot
Banana
Berries (all kinds)

Cherries
Clementine
Dates
Dragonfruit
Figs
Grapefruit
Grapes
Guava

Kiwi
Melons (all kinds)
Mango
Nectarine
Orange, navel, mandarin

Papaya
Peach
Pear
Pineapple
Plums
Pomegranate
Pumelo
Pomegranate

Veggies

Arrowroot
Artichoke
Arugula
Asparagus
Bamboo
Beans, green
Beets
Bok choy
Broccoli
Brussel sprouts

Cabbage
Carrots
Cauliflower
Celery

Collards
Cucumber
Eggplant
Fennel

Kale
Leeks
Lettuce
Mushrooms

Okra
Onion
Peas, green
Bell peppers

Pumpkin
Radish
Rutabaga
Spaghetti squash

Spinach
Swiss chard
Tomato
Turnip
Yam root
Zucchini

Foods listed here are placed in the macronutrient category that they primarily contain. There are foods in this handout that will contain another macronutrient or will contain all three macronutrients. Please read the food label for accurate macronutrient amounts.