

Fluids for Athletes



Fluids Are Important For All Athletes! Why?

Dehydration reduces aerobic exercise performance and makes exercise seem harder. Athletes who are dehydrated are not able to stay as cool during exercise and may develop heat illness.

Targets:

- To start exercise hydrated and with normal electrolyte levels.
- To avoid decreases in performance due to excessive dehydration.
- To avoid drinking more fluid than needed to replace sweat loss.
- To deliver carbohydrate and electrolytes along with fluid (e.g., sport drink) during prolonged exercise.

Why?

- To help maintain core body temperature within acceptable limits.
- To avoid excessive changes in electrolyte balance.

MONITOR YOUR FLUID LOSSES:

- Ample, light coloured urine means well hydrated
- Dark, scant urine signals a need for more fluid
- Weigh yourself before and immediately after exercise – see “Fluids after exercise” below.

Fluids before exercise:

- Drink enough fluid daily to maintain weight and adequate urine output
- Drink 5–7 mL/kg of body weight (300–500 mL) of fluid at least 4 hours before exercise.
- Drink 3–5 mL/kg of body weight (150–350 mL) of fluid about 2 hours before exercise, if you have not produced any urine or if your urine is still bright yellow.

Try this in training to find how much fluid is comfortable.

LIMIT beverages that contain caffeine and alcohol.

Fluids during exercise:

Drink enough fluid to prevent excessive dehydration. Sweat rates range from 0.4 to 1.8 litres per hour, depending on the individual, the type of sport, and the weather conditions. See the conversion exercise below to learn how you can monitor your body weight changes during training and competition to estimate your sweat rate.

- Drink about 0.4–0.8 L of fluid per hour (about 130–250 mL every 20 minutes).
- Test the amount and type of fluid in training.

CONVERSION:

1 kg weight loss = 1 L of fluid
250 mL = 1 cup = 8 fluid ounces
1 L = 4 cups = 32 fluid ounces
1 kg = 2.2 lbs.

Joanna drank 1 L of water during her 2-hour practice. She weighed 60 kg before practice and 59 kg after practice. What is Joanna’s sweat rate?

Step 1. Weight loss: 60 kg – 59 kg = 1 kg lost

Step 2. Conversion: 1 kg lost = 1 L fluid lost

Step 3. Total fluids: 1 L fluid consumed + 1 L fluid lost = 2 L total sweat loss

Step 4. Sweat rate: 2 L sweat loss ÷ 2 hours = 1 L of sweat per hour of practice

Joanna sweats about 1 L per hour of practice. Next time, Joanna should try to drink close to 1 Litre per hour of practice, in order to limit her weight loss to 1–2 pounds.

Fluids after exercise:

- Replace any fluid and electrolyte deficit. Note that significant dehydration (more than 2–3 pounds weight loss) takes 24–48 hours for complete recovery.
- Athletes who need to exercise again in less than 12 hours should replace fluid loss by 150% (drink 1.5 L of fluid per kg of weight loss). The extra fluid is to compensate for urine lost after drinking a lot of fluid quickly.



Fluids for Athletes

Page 2



Fluids after exercise: (continued)

- Include sodium with foods or in fluids consumed after exercise. Sodium enhances thirst and fluid retention and helps maintain plasma electrolyte balance.

How much does Joanna (from above) need to drink after practice if she is training again in 6 hours?

Step 1. Weight loss: $60\text{kg} - 59\text{kg} = 1\text{kg}$ lost

Step 2. Conversion: $1\text{ kg lost} = 1\text{ L fluid lost}$

Step 3. $150\% \times \text{loss}$: $1\text{ L fluid lost} \times 150\% = 1.5\text{ L fluid needed to replace loss}$

Joanna needs to drink 1.5 L of fluid after practice to recover for her next practice.

AWAY FROM HOME

Although tap water may be “safe” to drink, variations in the bacteria may cause gastro-intestinal upset. Adding ice to drinks is the same as adding tap water.

Acclimatize:

If you expect to compete in a very hot environment, acclimatize yourself prior to competition by:

- Training in a similar environment prior to departure
- Traveling to the competition site at least a week prior to competition and gradually increasing your training in those conditions.

If you are not acclimatized and you are exercising in hot, humid conditions, make sure your fluid replacement drink contains sodium, lightly salt the pre-competition meal or choose foods containing salt (tomato or vegetable juice, salted crackers, soup).

For more information, refer to [Exercising in the Heat?](#) on the CAC website and [Heat Adaptation](#) at the Canadian Sport Centre Pacific website. If you are training or competing in a hot climate, consult your [Canadian Sport Centre](#) physiologist or dietitian for a hydration plan.

FACTORS THAT ENCOURAGE FLUID CONSUMPTION:

- Easy access to the beverage
- Chilled drinks (about 10 degrees C)
- Flavoured beverages
- Sodium added (0.5–0.7 g/L to enhance flavour).

CARBOHYDRATE – ENERGY FOR ENDURANCE:

If exercising more than 1 hour, consume carbohydrate with your fluids.

- Commercial sport drinks containing 4% to 8% carbohydrate (40–80 g/L) are a suitable choice.

Test sport drinks in training, not in competition.

You can make a fluid replacement drink by mixing:

500 mL unsweetened orange juice

500 mL water

1.25–1.75 mL salt

One litre = 54 g (5.4%) carbohydrate and 0.5–0.7 g sodium.

Avoid salt pills:

Salt pills are too concentrated, need a lot of water for adequate dilution, and can lead to vomiting and diarrhea.

Recovery after exercise:

- Drink 1.5 L of fluid for every kilogram of weight lost during exercise.
- Consume high carbohydrate foods and drinks.
- Consume foods containing sodium (tomato or vegetable juice, pretzels, commercial soup, low fat cheese, salted nuts) and foods containing potassium (vegetables, fruit, milk, legumes, or meat) to replace electrolytes.

DRINK BEFORE THIRST – exercise dulls the thirst mechanism.

SNAC Sport Nutrition Advisory Committee
Comité consultatif sur la nutrition sportive

