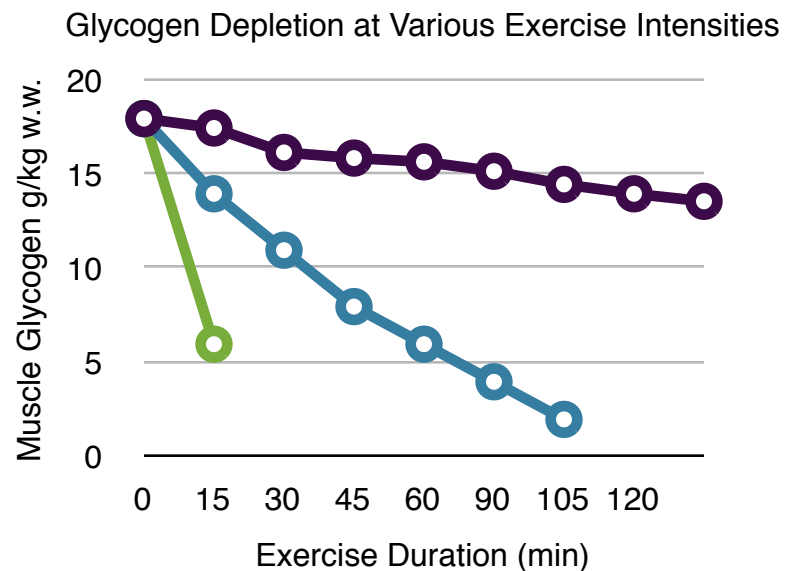


During Exercise

Carbohydrate is the body's primary energy source during exercise. Dietary carbohydrates (grains, fruit, starchy veggies, milk and yogurt) are stored in the liver and in the muscle as glycogen. During exercise, the body draws upon these glycogen stores (primarily muscle glycogen) to fuel working muscles. The speed with which our body exhausts these energy supplies depends on workout intensity, such that harder, more intense workouts use up glycogen reserves more quickly than more moderate exercise bouts. Glycogen stores are limited, so during prolonged exercise > 60-90 minutes, consuming carbohydrate while exercising can help improve performance by:

- ✓ Reducing the risk of hypoglycemia (low blood sugar)
- ✓ Providing fuel for actively working muscles
- ✓ Sparing protein (you don't want your body to start breaking down muscle for energy)
- ✓ Preventing "bonking," or "hitting the wall" and being forced to slow down or stop



What Should I Eat?

The table provides examples of solid foods, whole foods, and sport foods and liquids that can deliver carbohydrate while training/competing. What you choose is a matter of personal preference and tolerance. Research shows that 40-60g of carbohydrate per hour will help delay glycogen depletion and keep you feeling strong.

✓ Be sure to practice in training before trying something new in competition!

To limit gastrointestinal distress during training/competition consider applying the following tips:

- ✓ Get fit and acclimatized
- ✓ Stay hydrated
- ✓ Practice drinking during training
- ✓ Avoid "Over-Nutrition" both before and during competition
- ✓ Keep your pre-race meal moderate in protein and low in fat
- ✓ Eat a high-energy, high carbohydrate diet regularly
- ✓ Avoid high-fiber foods before exercise
- ✓ If prone to GI problems, limit NSAIDS (anti-inflammatory medication), alcohol, caffeine, antibiotics, & supplements
- ✓ Visit the Port-A-Potty BEFORE you start!

Food	Carb Content
1 med banana	25g
1 slice Bread w/ PB	15-20g
1 Fig Newton Bar (2 Cookies)	14g
1 oz Pretzels	20g
1 Med white roll with 1 T jam	50g
1 Clif Bar / 1 Luna Bar	40-45g / 23-28g
3 Clif Bloks / 6 Luna Moons	25g
1 Sport Gel (i.e., Gu, PowerGel, ClifShot)	25g
Gatorade (8 oz)	14g
500-1000mL/hr (18-34 oz)	30-60g
Coke (12oz)	40g



Fat

In order to adopt healthy eating habits, it helps to have a good understanding of the foods that we eat. Carbohydrate, protein, and fat are macronutrients. These foods deliver calories to the body and calories represent energy that our body transforms into the capacity to think, play, move, work, focus, and exercise. This handout provides a basic understanding of dietary fat - food sources, functions, and tips on what to choose. Fat often gets a bad reputation as people associate fat in our diet with fat on our bodies. Just like carbohydrate and protein, fat is an essential nutrient, imperative for overall health. The key is understanding what choices to make.

Food Sources:

1. **Animal Products:** meat, full-fat dairy, fatty fish, egg yolk
2. **Processed Foods:** cookies, crackers, baked goods, salad dressings
3. **Vegetable Oils:** canola, olive, peanut, sesame, walnut, safflower...
4. **Vegetables:** nuts, seeds, avocado



Fat Function:

- ✓ Provides energy during low to moderate intensity exercise (i.e., walking, jogging, easy cycling)
- ✓ Sheathes neurons and plays a role in sending messages throughout the body
- ✓ Comprises cell membranes and plays a role in cell signaling
- ✓ Certain fats, those we find in fish, avocado, olive oil, and nuts, can help improve heart health and reduce inflammation in the body
- ✓ Provides flavor and texture to food and meals
- ✓ Facilitates absorption of fat-soluble vitamins and minerals

Tips & Tactics:

✓ GENERAL HEALTH:

- Choose LEAN meat and limit red meat consumption to once per week. Excess saturated fat associated with fatty animal products can increase cholesterol and increase risk for cardiovascular disease.
- Opt for skim or 1% dairy products
- Favor fresh, whole, UNPROCESSED foods vs. processed and packaged goods. The trans fats often found in processed foods clog arteries, decrease fertility, and increase inflammation.
- Incorporate more HEALTHY FATS like olive oil, almonds, walnuts, canola oil, avocado, fatty fish and peanut oil
- Choose AGED cheeses and use sparingly. A sharper, more flavorful cheese can flavor dishes nicely in smaller quantities than more milder cheeses



✓ SPORT SPECIFIC TIPS:

- An athlete's diet is a low fat diet but not a no-fat diet. Incorporate healthy fats as part of an overall varied and balanced eating plan.
- Fat provides energy for lower-intensity exercise and is a significant fuel source for endurance and ultraendurance events
- Omega-3 fatty acids (flax seeds, walnuts, salmon) provide valuable nutrients and reduce inflammation.
- Limit fatty meat and fried foods. Reconsider traditionally low-quality, high-fat fast food options prior to training or competition in favor of a high-carbohydrate meal with moderate amounts of healthy fat.



Hydration



Athletes must remain hydrated in order to train and compete at top levels. A loss of body weight (as little as 2-3%) from water can result in decreased performance. Fluid needs are influenced by gender, age, body mass, outside temperature, sweat rate, climate, altitude, and sport type and are therefore highly individual. Understanding why hydration is important for performance and how much YOU need to consume can help prevent unnecessary complications.

How can hydration status impact performance?

Water helps the body regulate many important functions:

- ✓ Temperature (*sweating cools the body*)
- ✓ Blood pressure
- ✓ Nutrient concentration (*fluid helps maintain appropriate levels of electrolytes in the body*)
- ✓ Nutrient transportation
- ✓ Recover from intense training

Allowing the body to become dehydrated can cause muscles to cramp, alter blood pressure, cause weight loss during exercise, delay recovery time, and decrease performance. Drinking too much water can alter electrolytes and cause bodily harm (hyponatremia).

How much should I drink?

Fluid needs are highly individual, but all athletes should get into the following habits:

- ✓ Drink a glass of water, milk, or 100% juice with each meal
- ✓ Carry a water bottle around while at school or work
- ✓ Pay attention to thirst and drink when thirsty
- ✓ Determine your personal sweat rate: *Sweat rates can vary considerably among athletes. It pays to know how much YOU sweat in different environments. See box below on how to calculate.*
- ✓ Drink more when adapting to a new environment (*i.e., high altitude, hot, humid*)
- ✓ Remember that you can get dehydrated in the cold too. The body loses water as you breath.

- ✓ Start hydrating at least 4 hrs prior to training or competition
- ✓ Aim to replenish 150% of lost fluid after training
- ✓ Monitor your urine color (pale yellow is ideal) & frequency

When to use Sport Drinks:

Sport drinks were designed for use before, during, and after intense or long training sessions and serve important functions for athletes.

1. Hydration
2. Provide fuel for muscles (carbohydrate)
3. Provide electrolytes
4. Some sport drinks offer protein. This is not essential during exercise, but is important for recovery.

Consider a sport drink if...

- ✓ Training intensely > 45 minutes in heat
- ✓ Two-a-day practices
- ✓ Tournament or multi-day event
- ✓ Endurance training > 90 minutes
- ✓ Training/Competition when last meal was > 3 hrs prior

Sport drinks should not be your “go-to” drink during the day. Instead opt for plain water or a more nutrient dense milk or 100% juice option unless you are in a before, during, or after training window.

Measuring Sweat Rate...

- Step #1:** Weigh yourself (minimal clothing, no shoes) before training/competition
- Step #2:** Keep track of all fluid consumed during training
- Step #3:** Weigh yourself after training (same clothing)
- Step #4:** Find the difference and convert to ounces (1 lb. = 16 oz or 2 cups of fluid)
- Step #5:** Add the ounces you consumed during training
- Step #6:** Determine hourly sweat rate: divide total ounces lost by hrs of training.

Example

Tim practices for 2 hours and drinks 20oz (2.5 cups)

Weight #1:	175 lb.
Training Fluid:	20 oz
Weight #2:	172 lb.
Difference:	- 3 lb.
Difference (oz):	48 oz
Add training fluids:	48 + 20 = 68 oz (8.5 cups)
Sweat Rate:	68 oz / 2 hrs = 34 oz/hr or ~4 cups per hour



'Pre-Game'

What to Eat Before Training & Competition

Your pre-event meal is important. It is your last opportunity to “top-off” your body’s fuel tanks with carbohydrate-rich foods so you can step onto the field, up to the line, or into the blocks well-fueled, ready to compete, and confident that you are nutritionally ready to go. Your last meal before an intense training session or competition should be 2-4 hours prior. Since carbohydrate is your primary fuel source during exercise, you want this meal to be comprised primarily of carbohydrate. This meal should contain moderate amounts of protein, and be low in fat. A high-fat, high-protein meal just before exercise may delay gastric emptying and prevent carbohydrate from being readily digested, absorbed; it can also cause potential discomfort during exercise. Calorie contents of these pre-event meals will vary based on your sport, intensity level, duration of exercise, gender, size, and energy needs; however, the following meals offer some guidelines and give you some examples of foods to consider. Always remember to practice eating new foods before *training* sessions instead of trying something new before a big meet, race, game, or match. Determine what your body tolerates best - everyone is different and there is no *perfect* combination for everyone.



Pre-Game Breakfasts

MEAL #1: 1-2 cups cereal with 1-1.5 cups skim/1% milk, sliced fruit, and handful of nuts

MEAL #2: 1 cup lowfat/nonfat fruit yogurt, 1/2 - 1 cup crunchy cereal (i.e., grape nuts, granola, Kashi), fruit

MEAL #3: 2 slices of toast OR 1 English muffin OR 1 bagel with 1-2 Tbsp natural peanut butter, honey, and sliced banana; 8-10 oz skim/1% milk or orange juice

MEAL #4: 2 eggs (or 1 egg + 1 egg white), 2 slices of toast with honey or jam; 1 cup fruit; 1 cup milk



Pre-Game Lunches

MEAL #1: Turkey Sandwich (2 slices whole grain bread; 2-3 slices deli turkey or chicken, 1 slice mozzarella cheese, veggies); piece of fruit; 1 cup milk

MEAL #2: Pasta Salad (1.5 cups pasta, 1 cup veggies, 1/2 can tuna, chicken, or salmon, 1 cup veggies (broccoli, carrots, tomatoes, peas); 1.5 Tbsp vinaigrette dressing; piece of fruit

MEAL #3: 1 med baked potato or sweet potato; 2-3 turkey “roll-ups” (rolled slice of deli turkey); string cheese; 15-20 Kashi-type crackers; 1 apple

MEAL #4: Tuna or salmon salad sandwich in whole wheat pita (try making with olive oil and balsamic vinegar instead of mayonnaise), fresh fruit, crackers OR baked chips OR pretzels; 1 cup milk

Tips to Remember:

- ✓ Carbohydrates come from grains (rice, cereal, crackers, pasta, bread), fruit, starchy veggies (potatoes, corn, peas, squash), and dairy (milk and yogurt)
- ✓ Your meal should contain mostly carbohydrate, moderate amounts of protein and be low in fat
- ✓ Consider low-fiber, easily digested foods for pre-game meals (especially if you are not used to eating a high fiber diet)
- ✓ Aim for 0.45 - 1.36 g of carbohydrate per lb. of body weight (or 1-3g/kg) in the pre-event meal
- ✓ If nerves keep you from tolerating too much food, consider a fruit smoothie or sport nutrition products, but don't go without eating!
- ✓ In the hour before, use sport drinks or sport products (gels, bloks) to top off carbohydrate stores
- ✓ Never experiment before a major competition! Practice in training what you plan to do for big events.
- ✓ Know your body, what you like and what you can tolerate



Recovery Nutrition



Sport requires energy, and the body gets this energy from calories in food (carbohydrate, protein, and fat). The body converts calories from carbohydrate-rich foods (grains, fruit, dairy) into a quick source of energy called glycogen, which is stored in the muscle and used for intense activity. This muscular fuel is like the body's gas tank; it needs to be filled before intense and/or long training sessions and refilled after so that the body can continue to perform at its best. Training uses up muscle glycogen, depletes fluid, and breaks down muscle tissue. Well-balanced eating and appropriate

hydration after a workout helps the body replenish lost fluid and nutrient stores, repair damaged tissue, and prepare for the next workout.

When you eat matters:

Pay attention to timing for best recovery results

- ✓ The body is primed to replenish lost nutrients soon after exercise. After a workout, game, match, or race, start refueling within 15-60 minutes.
- ✓ Recovery in 3 stages - see box for examples
 - 1.) **Snack + Fluid (15-60 min)**
carbohydrate & 10-15g protein
 - 2.) **Meal + Fluid (within 2 hrs)**
Balance (mostly carbs, lean protein, low fat)
 - 3.) **Snack + Fluid (within 4 hrs)**
carbohydrate & 10-15g protein

When is recovery crucial?

Fueling well after workouts is always important; however, certain types of training/competition require greater attention to detail:

- ✓ 2 or more training sessions per day
- ✓ Less than 8 hours between training sessions
- ✓ Endurance training sessions > 90 min
- ✓ Intense training
- ✓ Tournament / multi-day competition

Recovery Examples:

Stage 1: Snack

- ✓ Peanut butter and jelly sandwich
- ✓ Fruit yogurt
- ✓ Sport bar



If you don't have an appetite, choose drinks containing both carbohydrate and protein:

- ✓ Chocolate milk
- ✓ Sport nutrition recovery drink
- ✓ Smoothie with fruit and yogurt

Stage 2: Meal

- ✓ Pasta with tomato sauce, veggies & chicken
- ✓ Turkey sandwich, whole wheat crackers & fruit
- ✓ Stir-fry with rice, veggies, & lean meat

Stage 3: Snack

- ✓ Whole grain crackers & string cheese
- ✓ Graham crackers with peanut butter
- ✓ Cereal with low-fat milk

Recovery Fluids:

- ✓ Sport drink (carbohydrate + electrolytes)
- ✓ Sport nutrition recovery drink
- ✓ Milk / Chocolate milk
- ✓ Smoothies
- ✓ Water

