



# Golf Nutrition – Eating Right to Win

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# Optimal Nutrition During Golf

## - The Rationale

### The energy demands of playing golf:

- The average round is 227 minutes and the players walk a minimum of 9000 metres.
- Most time was spent at moderate exercise intensity: 82 minutes at 50-74% of maximal heart rate reserve. However, there was a wide gap between the average and maximal heart rate, indicating considerable temporary physical demands.
- Players also lost an average of approximately 2½ pounds (or 1.2 kilograms) over the round.
- RCGA research suggests that players expend about 2000-2500 calories during a round.



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# Optimal Nutrition During Golf

## - The Rationale

### Why worry about what you eat?

- There is research evidence that the adjusting your eating schedule and what you eat is important to help you achieve your goals of sports performance both in daily training and in the competition setting.
- There is an overwhelming body of literature concluding that during prolonged exercise (i.e. > 45-60 minutes) the consumption of 1) carbohydrates and 2) water will greatly increase performance.





# Pre-Exercise / Golf Nutrition

## When should I have my “pre-game meal”?

- Generally the pre-exercise period is defined as the four hours before exercise begins. Three to four hours are needed for a large meal to digest (the smaller the meal, the quicker it can be digested). So have a meal about 3-4 hours before you plan to practice or play. An additional snack can be taken about an hour before you play. *Since golf games take 4-5 hours, you should also pay attention to your nutrition **during** your round to make sure you have as much energy near the end of your game as you had at the beginning!*





# Pre-Exercise / Golf Nutrition

## What are the characteristics of a good pre-game meal?

- High in carbohydrate to maximize glycogen stores
- Low in fat and fibre to facilitate gastric emptying and minimize gastrointestinal distress
- Moderate in protein
- Familiar and well tolerated, as determined through experimentation in previous sessions



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# Pre-Exercise / Golf Nutrition

## 3-4 Hours before training / play / practice

- The general rule is that 3-4 hours are needed for a large meal to digest (obviously, the smaller the meal, the quicker it can be digested). Most (but not all) studies have shown that ingestion of a meal containing 140-330 grams of carbohydrate 3-4 hours before exercise has enhanced athletic performance. Defining the best amount of pre-exercise food for an individual is difficult because tolerances vary greatly from person to person. Some golfers like to eat a balanced meal with good carbohydrates, but also good fats and proteins like eggs so they don't get hungry later in the round. You can experiment with what works best for you to give you lots of energy, but also keeps you from not getting hungry.



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# Pre-Exercise / Golf Nutrition

## 3-4 Hours before training / play / practice

- The most likely mechanism for the improvement in performance is maintenance of blood glucose levels during exercise via increased muscle and liver glycogen.
- Examples of a good meal 3-4 hours before:
  - **whole wheat spaghetti with tomato and meat sauce.**
  - **Chicken sandwich with soup**
  - **Omelets with toast**





# Pre-Exercise / Golf Nutrition

## 60 minutes or less before training / play / practice

- Individual practice should be based on individual experience, but small snacks that are mostly carbohydrate are probably best. Try to figure out what works best for you.
- Although it is not necessary to eat during the hour before you play, neither is it likely to be harmful to performance as was once speculated. If you must eat during this time period (for example, trying to squeeze in a snack before your warm-up) choose a smaller meal of easily digested foods.







# Pre-Exercise / Golf Nutrition

## The functions of a pre-exercise snack are as follows:

- Prevent low blood sugar by optimizing muscle and liver glycogen stores (high energy)
- Ensure proper hydration (not thirsty)
- Leave the athlete neither hungry nor with undigested food in the stomach (not hungry, not full)
- Provide positive psychological reinforcement that the body is well fueled (feel good)
- Avoid the exaggerated increase in plasma insulin concentrations that sometimes results in rebound hypoglycemia in susceptible individuals (no fatigue)



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# Pre-Exercise / Golf Nutrition

**The functions of a pre-exercise snack are as follows:**

- Examples of a good snack less than 1 hour before:
  - Fresh fruit (bananas are great) & nuts
  - Whole wheat bagel & light cream cheese
  - Yogurt & fruit
  - Cereal with skim milk





# Pre-Exercise / Golf Nutrition

## What if my round is very early?

- What if my round starts in the morning and can't get up 4 hours before?
- Liver glycogen (which is largely the source used to maintain normal blood glucose levels) is labile and may become substantially depleted over the night. Beginning exercise with low blood sugar is likely to lead to early fatigue. Herein lays the importance of eating before morning events.





# Pre-Exercise / Golf Nutrition

## What if my round is very early?

- If it is not practical to wake-up 4 hours before you exercise, try the following recommendations:
  - Consume a small snack 30-90 minutes before exercise.
  - **Fresh fruit (bananas are great) & nuts, Whole wheat bagel & light cream cheese, Yogurt & fruit, Cereal with skim milk**
  - Eat high quality carbohydrates with your proteins at dinner the night before.
  - **Pasta with meat sauce, long grain rice with stir fry veggies & chicken**
  - Have an evening snack (again focusing on carbohydrates) the night before.





# Golf Nutrition – The most important nutrient - WATER!!!

## Hydration before you play

- The fact that water is vital for peak bodily function is unequivocal. Although a separate paper could be written on the benefits of proper hydration and the dangers associated with dehydration, some general guidelines are:
  - Up to two hours before the start of an exercise approximately 500 mL of fluid should be consumed.
  - Drink another 250 mL 30 minutes before, then another 250 mL 15 minutes before the game.





# Golf Nutrition –

## The most important nutrient - WATER!!!

### Hydration during a game

- It is not uncommon for athletes to lose significant amounts of weight via sweat, especially in hot environments. A 1% reduction in body weight corresponds with the need for your heart to beat an extra 3-5 times per minute. A 3% loss can significantly impair performance. Losses beyond this can have severe health repercussions. It is imperative for a golfer to limit weight loss to less than 1% of total body mass during play. As the weight of every player is different, and there is great variation between the sweat rates of individuals, it is recommended to try weight loss/hydration experiments during practice to determine your own specific fluid requirements. Record your body weight before and after the round, as well as how much fluid was consumed during play. Every kilogram lost represents the loss of one litre of fluid that needs to be replaced.
- **Despite the difficulty in advising on water requirements because of individual differences, consuming 100 mL every 10 minutes is a good general guideline.**





# Golf Nutrition – more details

## Why are carbohydrates so important?

- The bodies' total reserves of carbohydrate (muscle and liver glycogen) are limited and are substantially less than the fuel requirements in many athletic events.
- Keep in mind that golf performance requires a good warm-up, a 4-5 hour round where you walk up to 7 km, and then practice after a round. All of this happens over several days in a tournament!
- So having carbs gives you the energy you need to play the game, to perform near the end of your round, and most importantly, near the end of a tournament.



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# Golf Nutrition – more details

## How much carbohydrate?

- Much research has been done investigating how fast the body can use carbohydrate during exercise. Although different factors will slightly influence this rate, there is general agreement that the body can only metabolize 1.0-1.1 grams carbohydrate per minute. Too little intake may not provide enough energy to sustain optimal work rates in muscle. On the other hand, ingestion of too large quantities may lead to gastrointestinal discomfort that compromise an athlete's ability to perform in competition.



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# Golf Nutrition – more details

## How much carbohydrate?

- It should be noted, that slightly less than this amount may be needed in the sport of golf. In high intensity exercise, the muscle relies more on carbohydrate as a fuel source. Golf would be considered a low-moderate intensity sport as it is often played at less than 50% of VO<sub>2</sub>max. We recommend about 30-35 grams of carbohydrates per hour during golf.





# Golf Nutrition – more details

## What about protein before or during golf?

- At least one study found that the addition of essential amino acids to carbohydrate consumed immediately before exercise resulted in increased amino acid delivery to muscle and greater net muscle protein synthesis compared with consumption of the supplement at various times after exercise.





# Golf Nutrition – more details

## What about protein before or during golf?

- As dietitians generally recommend the consumption of mixed-nutrient meals anyway, it is prudent to include some protein source along with the standard pre-exercise carbohydrates. Lean proteins should be favoured over higher fat proteins, as fat delays gastric emptying.
- Some examples include
  - **Add some skim cheese to your whole wheat bagel**
  - **Add chicken or other lean meats to your whole wheat sandwich**
  - **Yogurt has good proteins as well**





# Golf Nutrition – more details

## So what should I do during a game?

- Consume carbohydrates – no more than 30-35 grams every hour (whole wheat, crackers ,fruit).
- Fluid – as much as is required to replace what is lost due to sweat.
- The obvious food that fits these criteria is a sports drink. Look for one that has 5-8 grams of carbohydrate per 100 mL. This is the range where both fluid and carbohydrate delivery will be high. The drink should also contain 30-50 mmol/L of sodium. Gatorade is a tested and true brand that follows these specifications.





# Golf Nutrition – more details

## So what should I do during a game?

- Alternatively, plain old [water](#) could be consumed. But then food must be eaten to replace the carbohydrates. Food eaten during a round must be convenient and transportable. Some examples are granola bars, trail mix and dried fruit.
- [Bananas are also great](#) as they have good carbohydrates and also potassium that you lose in sweat.





# Golf Nutrition – more details

## What does exercise do to the body?

- Breaks down body proteins (muscle) - Skeletal muscle contains about 50% of total body protein. Both resistance and endurance exercise can induce muscle protein damage,
- Depletes carbohydrate stores (glycogen) - Carbohydrate is the predominant source of energy for muscle metabolism during short (<60 sec) bouts of supra-maximal work and the preferred fuel for muscle for prolonged, moderate intensity exercise lasting up to 4 hours.





# Golf Nutrition – more details

## What are the main nutrients to consume after exercise?

- Protein (in the form of skeletal muscle) and carbohydrate (in the form of glycogen) will be depleted during exercise. Therefore, these two nutrients play a key role in post-exercise nutrition. It is also vital to eat AS SOON AS IS PRACTICAL after you exercise. There is a window of time after which the bodies` capacity to rebuild itself diminishes. It is important to capitalize with good nutrition during this window of time



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# Golf Nutrition – more details

## So then what should I eat after golf?

- Protein – approximately one quarter of your daily requirement
- Carbohydrate – still the most abundant nutrient
- **Water** – however much you lost and were not able to replenish during play (weighing before and after is the best way to assess this)
- Some examples are: turkey sandwich on whole wheat bread, power bar, ½ cup of almonds with small glass of fruit juice







# My Personal Golf Nutrition Plan (e.g.)

## Breakfast:

- ▮ Scrambled eggs, 500 mL water, piece of fruit, yogurt

## During warm-up (stretching, range, putting and chipping time before you tee-off):

- ▮ Piece of fruit, water

## During the first 6 holes:

- ▮ Banana, water or a mix of Gatorade and water if it is hot

## During the middle 6 holes:

- ▮ Half of a sandwich, water

## During the last 6 holes:

- ▮ granola bar or fruit, water (or Gatorade if getting tired)

## After the round and before post-round practice at the range / short game area:

- ▮ nuts, water, 2<sup>nd</sup> half sandwich, banana

## My recovery plan (how will you refuel to get ready for the next day's game?

May include more than just nutrition, e.g. stretching, hot/cold showers, massage, etc...):

- ▮ hot shower, stretching, relax watching television
- ▮ eat spaghetti with tomato sauce and veggies / protein (i.e. chicken)
- ▮ lots of water



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Dr. Greg Wells is a scientist at the Toronto General Hospital and The Hospital for Sick Children. He is an Assistant Professor at the University of Toronto Department of Anesthesia / Faculty of Medicine and also an instructor at University of Toronto's Department of Physiology. Dr. Wells also teaches at the Canadian Sport Centre's National Coaching Institute. His research, teaching and clinical practice is focused on improving health and performance under extreme conditions such as respiratory and muscle diseases including cystic fibrosis and metabolic syndrome and competitive situations encountered by elite athletes. Recently Dr. Wells has been using advanced magnetic resonance imaging and spectroscopy techniques to help elucidate pathophysiologies of disease and improve understanding of elite performance.

Dr. Wells is now serving as the Director of Sport Physiology for the Canadian Sport Centre, where he works closely with Canadian National Team athletes and coaches in the area of physiological performance enhancement. His athletes have won numerous medals at Commonwealth Games, World Championships and Olympic Games. Dr. Wells has served as the Exercise Physiologist for the Royal Canadian Golf Association and has worked with the Canadian National Golf team since 2002. He sits on the RCGA long-term player development committee and is a regular contributor to Golf Canada and Fairways Golf magazines.

He has presented before leading sports and medical organizations around the world, including the International Olympic Committee, International Congress on Child Neurology Canadian Cardiovascular Congress, North American Cystic Fibrosis Foundation and the American College of Sports Medicine. Dr. Wells has also been a consultant to some of Canada's top business organizations on human performance. He received his Ph.D. from the University of Toronto, post-doctoral research training at the Hospital for Sick Children and is a professional member of the American College of Sports Medicine and the Canadian Federation of Biological Societies.





# Authors

## **Denis Collier, M.Sc., R.D.**

Denis Collier's unique combination of expertise in the fields of nutrition and exercise are second to none. He is a Registered Dietitian, holds a Masters degree in Exercise Physiology and is a Professional Fitness and Lifestyle Consultant.

Based out of Toronto, Ontario, Denis is the founder of COLLIER Fitness & Nutrition Inc., a company dedicated to helping goal-oriented individuals optimize their health and/or performance. Denis has helped athletes reach the medal podium at national competitions and busy executives lose excess weight that has plagued them for years. He has also presented fitness and nutrition seminars for universities, sports teams and businesses.

Denis prides himself on converting the latest scientific research into easy to implement strategies. He writes sports nutrition research articles that are circulated in the national newsletter of the Canadian Society of Exercise Physiology (past topics have included "Pre-Exercise Nutrition", "Post-Exercise Nutrition" and "Iron in Health and Fitness"). His advice for casual exercisers has often been quoted by the media.

In addition to his formal education, Denis has learned about fitness by participating in virtually every sport available to him. He is a former junior hockey player and varsity athlete in two sports – wrestling and track. An avid exerciser, he varies his year round training program to include specific phases focusing on Olympic-style weightlifting, muscle building and cardiovascular endurance.

Denis is fortunate to hail from the greatest place on Earth, Newfoundland Canada. He earned his undergraduate degree in Dietetics from Memorial University then completed his dietetic internship with the Health Care Corporation of St. John's. He achieved his second degree (a Masters degree in Kinesiology with a focus on Exercise Physiology) from Lakehead University. Here he also completed an extensive course to become a PFLC (Professional Fitness and Lifestyle Consultant).

He is a member of the College of Dietitians of Ontario, Dietitians of Canada and the Canadian Society of Exercise Physiology.

