TENNIS NUTRITION GUIDE

Overview

Whether preparing for the club championship or Wimbledon, optimal nutrition is essential to enhance tennis performance and ensure adequate recovery. Therefore, appropriate selection of foods, fluids, sport foods and supplements may all help in a player's quest to reach peak performance and gain a competitive edge.

Nutrition for tennis, as for all sports, can be confusing. Suitable nutritional needs must be adjusted for a player's age, fitness, level of competition and intensity of play, environment, time of competition, duration of play, amount of time between matches, and many other factors.

Match preparation, from a nutritional standpoint, is made more difficult by the unpredictability of how long any given match will go as well as varying amount of recovery time between matches. This section covers the general nutrition guidelines to eating a balanced diet for good health, but mainly focuses on nutritional issues relating to tennis performance.

Eating Right

Food is the source of nutrients, and to get the nutrients we need, we require a varied and well-balanced diet. There are six classes of nutrients that include water, vitamins, minerals, proteins, fats, and carbohydrates.

Each nutrient is equally important, and to eliminate any class of nutrient from the foods we eat will have detrimental effects on performance (and health!). Energy can be obtained from foods that contain carbohydrates, proteins, and fats.

Vitamins and minerals do not provide a source of energy but are needed to derive energy from carbohydrates, proteins, and fats that are consumed. In addition, water circulates the other nutrients to the tissues where they are used and then removed as by-products of this tissue utilization.

Water is also critical for maintaining body temperature during intense play. For most players, a minimum of approximately 2,500 calories a day is recommended, although some players may require in excess of 3,000 calories.

Pro players are predicted to need between 3500 to 5000 calories/day. Beyond attempting to regularly consume a healthy, varied and well-balanced diet, players should particularly focus their efforts on adequate and appropriate consumption of four primary nutrient categories – fluids, electrolytes, carbohydrates and protein.

These nutrients have an immediate effect on performance, delay feelings of fatigue, and reduce a player’s proneness to injury and illness. At some point, we have all heard, “Drink lots of water!” Yes, water is good for us, but too much actually flushes nutrients from our system. What we need is 8 to 10

cups daily either of water or equivalent hydrating beverages. And what about other beverages? Beverages and foods that count toward daily water intake:

BEST: water, seltzer, club soda, mineral water, flavored water.

Very good: 100% fruit juices, lemonade, tomato and vegetable juices, low-fat/skimmed milk.

Good: raw fruits and vegetables.

So-so: soft drinks (diet soft drinks in moderation), decaffeinated coffee, yogurt.

Bad: caffeinated beverages and alcohol are diuretics and do not count toward water intake.

Top ten ways to increase your fluid intake & decrease caffeine:

1. Drink 8 to 16 ounces water-based beverage (water, juice, milk) with every meal and snack.

2. Alternate non-caffeinated beverages between caffeinated beverages throughout the day.

3. Limit caffeinated beverage intake after a certain time of day (for example, 1 pm).

4. Set a reasonable limit on coffee intake (for instance, 1 to 2 cups per day).

5. Substitute decaffeinated tea, soda, or coffee for some of your caffeinated drinks.

6. Increase your vegetable juice and milk consumption (2 cups of vegetable juice = minimum 4 vegetable servings per day; 2 cups milk = minimum dairy intake per day).

7. Try carbonated calorie-free fruit flavored waters.

8. Dilute juices with water.

9. Alternate plain club soda with alcoholic beverages.

10. Keep a water bottle with you at all times (freeze overnight so it stays cool during the day).

Carbohydrates

The best source of energy, providing fuel for your muscles, brain, and organs.

Carbohydrate is stored in the body in the form of glycogen.

Too few carbohydrates lead to glycogen depletion, which may lead to early on fatigue on court.

Carbohydrates should represent about 60% of the calories in your diet.

Found in cereal, bread, pasta, potatoes, rice, legumes, fruits, vegetables, and sports products (energy bars or sport beverages).

There are two types of carbohydrates – simple (sugars) and complex (starches). Sugars are simple carbohydrates. They are called this because the body digests them quickly and easily.

Starchy carbohydrates are referred to as complex carbohydrates. These carbohydrates take longer to digest than simple carbohydrates. It is generally recommended that complex carbohydrates be consumed; especially those with a low glycemic index (GI) because they have high fibrer and vitamin contents and give a sustained energy release over a long period of time.

However, liquid carbohydrate sources and foods containing simple carbohydrates may be used when it is necessary to raise the glucose level quickly during training or a match.

For tennis players, the glycemic effect can be very important, and it is critical that players understand which carbohydrates they should consume and when.

Both pre-and post-match, choosing higher glycemic index foods can provide quicker energy and quicker recovery, but in the general training diet, it is recommended that players choose lower glycemic index foods to maintain a consistent blood sugar and energy level.

This is discussed in detail in the Planning Meals section.

The GI rating, which ranges from 1 to 100, lets you know how quickly foods are changed into glucose. The faster the food is converted to blood sugar (glucose), the higher the rating.

Glucose is taken as the standard, with a value of 100. Values of 70 or higher are considered high, 56 to 69 medium and 55 or less low. The scale (right) shows the GI values for some popular foods.

However, keep in mind if you consume a food in combination with other nutrient categories, such as protein and fat, the glycemic index will change and be less of an issue.

Carbohydrates are stored as glycogen in the liver, which helps to maintain normal blood glucose, and in skeletal muscle, where it is used as a source of fuel for muscular activity.

Muscle glycogen is the main source of fuel used by the muscles to enable you to undertake both aerobic (with oxygen) and anaerobic (without oxygen) exercise, and may become a performance limiting factor during tennis, especially during long matches.

Fats

A fat source in the diet are an important source of energy during long matches and training sessions, but is not meant to be the main energy source for tennis play. Fat also helps maintain the player's appetite over longer so that he/she will not get hungry during play.

Too little fat may lead to vitamin deficiencies and organ damage and possibly weaken the immune system.

Too much fat increases the risk for heart problems, high cholesterol, and high blood pressure.

Fat takes the longest time to digest thus it is not a good source of quick energy during exercise.

Fat should represent about 20-30% of the calories in your diet (minimum of 30-40 grams/day), but up to 80-100 grams/day for elite player's energy needs.

Found in butter & oils, dairy products, nuts, olives, avocado, mayonnaise, dressing, meat & fish, fast food, and chocolate.

There are two main types of fats: saturated (normally found in animal fats, except fish), and (mono or poly) unsaturated fats (normally found in vegetable fats, oil, and fat fish).

Fats are a denser calorie source containing nine calories per gram, while carbohydrates and protein contain only four calories per gram. Ideally, on a heart healthy diet, players should choose twice as much vegetable origin fat vs animal origin fats.

Vegetable fats are considered essential - you need small amounts daily to help make hormones and help with regularity and healthy skin and hair as well as a secondary energy source for training.

Protein

Protein is crucial for meeting muscle and organ building and repair in the tennis player's body. Protein is not meant to be an energy source on the court.

Protein is becoming increasingly important for recovery needs between matches and after tennis play to help players return to the court in tip top shape. Latest research shows that players should consume an easy to digest form of protein within 30 minutes after tennis play.

Helps build and repair muscles.

Protein is the building block for hormones and enzymes that regulate metabolism and other body functions.

Proteins provide a small source of energy for muscles during exercise, but are not the ideal fuel.

Too little protein may lead to tiredness, weakness, poor recovery and injury.

More protein does not mean you will gain more muscle mass or strength.

Proteins should represent only 10-15% of the calories in your diet.

Found in meat, fish, eggs, dairy, poultry, vegetables and nuts.

Protein consists of polymers of amino acids, the building blocks of all proteins. Some of these amino acids are considered essential, meaning that the body cannot synthesize them, and therefore must be obtained from the diet.

Protein is used as an energy source when the glycogen stores are depleted and exercise is continued at a high intensity level. Players are advised to obtain necessary amino acids through consumption of natural, high quality protein foods, such as those mentioned above.

The western diet contains more than enough protein, so protein supplementation may not benefit performance.

In addition, if your diet is very high in protein, you will inevitably eat less carbohydrate, which means fatigue and a decline in performance may occur earlier as a result of glycogen depletion.

Electrolytes/Minerals

Sodium

Sodium is the key electrolyte and main extracellular mineral lost in sweat and should be increased in most competitive tennis player's diets to help minimize risk of heat illness and muscle cramping.

Essential mineral for muscle contractions, fluid balance, and nervous system function.

Too little sodium may lead to fatigue, headache, dizziness, and muscle cramps and heat illness.

Too little protein may lead to tiredness, weakness, poor recovery and injury.

Found in table salt, visibly salted foods such as pretzels, crackers and nuts; some natural food such as shrimp/prawns, and many processed foods such as cottage cheese or cured meats, canned vegetables, pickled foods, soups and sport beverages.

Supplemental salt may be necessary for athletes who sweat a lot and do not eat high-sodium foods or use sport beverages. Heavy sweaters may need to add table salt in small amounts to sport beverages.

Calcium

Calcium is also a mineral lost in sweat as well as the key mineral for strong bone density in tennis players. Particularly for female tennis players, calcium intake should be emphasised.

Consuming three dairy products per day is the key to help meet daily calcium needs. Supplementation may be needed if oral intake is low.

Essential mineral for bone and teeth development (99% of calcium is used for this).

Critical mineral for muscle contractions.

Too little calcium will lead to poor bone health, tooth decay, and muscle cramps.

Recommended daily intake: 1000-1300 mg.

Found in cheese, milk, yogurt, ice cream, fish bones (sardines), watercress and spinach.

Iron

Iron is another key mineral because of its energy carrying capacity. Low iron levels are an issue in female tennis. Iron in the diet should be emphasized to avoid undue fatigue and anaemia risk.

If blood levels are low, and anemia (low blood iron) is diagnosed by a medical professional, iron supplementation may be warranted.

1. Essential mineral for red blood cells and the cardio-pulmonary system (heart & lungs).

2. Found in hemoglobin which carries oxygen from the lungs to your working muscles.

3. Essential for the production and release of energy.

4. Too little iron may lead to tiredness.

5. Recommended daily intake: 12-18 mg.

6. Found in red meats, poultry, fish, bran, spinach, vegetables, dried fruit (raisins, apricots and figs) and fortified cereal. Animal sources are better absorbed by the body.

Potassium

Potassium is the main intracellular mineral, so is often misunderstood as a key electrolyte to increase to minimize heat illness risk.

This is not the case, but tennis players in general do need more potassium than the average adult as general body fluids decline with water losses.

1. Essential mineral for muscle contractions, fluid balance, digestion and nervous system function.

2. Too little potassium may lead to tiredness, dizziness, vomiting and muscle cramps associated with hypoglycemia.

3. Recommended daily intake: 3,000 mg.

4. Found in all fruits and fruit juices (especially bananas and melon), tomatoes and tomato juice, meat and dairy, green vegetables and bran.

Planning Meals

Just as it is important to eat a well-balanced diet on a daily basis, it is equally important to eat the right things before, during, and after competition and training.

The goal is to maximize your energy stores so you can meet the energy demands throughout the playing duration and to aid muscle growth and repair afterwards. To achieve this it is important to understand which foods to eat and when to eat them. However, it is important to eat foods that are familiar to you and are known to settle hunger.

Pre-Match Nutrition

During the week prior to a competition a player must alter their general food intake and training plan to ensure they are optimally prepared for the competition. In order to achieve this, the athlete must attain two major goals.

1. The athlete should gradually build up muscle glycogen stores.

2. The athlete should become well hydrated.

During the days prior to competition, players should replenish their carbohydrate stores (muscle and liver glycogen) so that they begin their competition with a full fuel supply. This is necessary because the majority of energy supply comes from the anaerobic systems, for which glycogen is the main fuel source.

It is important to eat plenty of complex carbohydrate foods, especially those with a low glycemic index (GI) to help boost glycogen stores. Moreover, a progressive increase over several days in carbohydrate intake and an associated decrease in training intensity and duration (known as taper training) before the start of an event can better optimize the filling of glycogen stores.

Up to four days before competition, as well as maintaining a high carbohydrate and fluid intake, it is important to have a little extra protein, up to 1.5-2 grams/kilogram, to ensure all tissues are fully repaired, and to support the production of creatine.

When to eat in the 24 hours prior to a match can be tricky to determine. Unlike other sports, in tennis, there is often no way of knowing exactly when you will be competing, unless you are the first match of the day, and no way of knowing how long the match is going to last.

Hopefully, by the morning of your competition, the previous day's eating will already have filled a player's glycogen stores. On the day of competition, a player should eat at least 90 minutes before a match, although ideally the pre-match meal should be consumed three hours before the match.

This means if you have an early morning match at 9:00 am, you need to finish breakfast at the latest by 7:30 am. If you are not used to getting up this early to eat it is recommended you spend the weeks leading up to the competition getting into the routine.

Sample meals would include for a breakfast: cereal and yogurt with toast and nut butter and fruit and water; for lunch: sandwich and pretzels with fruit and water.

Your pre-competition meal should be high in carbohydrate, low in fat, low in protein, low in fibre (i.e. not too bulky and filling), enjoyable and familiar. If you really do not feel like eating, try to have a liquid meal such as a carbohydrate drink or dairy and fresh fruit.

In addition, a pre-match snack of fast-absorbing carbohydrate just before you start playing can help to delay fatigue and enhance endurance. This snack should be consumed the hour before play.

If you start exercising within about five minutes, an increase in insulin will be prevented and your blood-sugar levels will remain slightly raised for longer. But, do not eat a concentrated refined sugar source right before match time such as a soda or smoothie or candy.

By late-morning / early afternoon the energy provided from breakfast will have been used. Therefore, it is important to have something to eat every two to three hours, but still remembering to leave at least 90 minutes before your match.

In-Match Nutrition

Change of ends provides the ideal opportunity to take extra carbohydrate and water during the match, and helps to prevent, or at least delay fatigue, dehydration and maintain exercise intensity, particularly in the latter stages of a match.

Recommended food & drinks on court:

1. Cold fluids on each change over to replace lost fluids and cool the body temperature.

2. Sports drinks are helpful to replace lost minerals (e.g. salt) and provide energy.

3. Moderate to high GI foods, such as high carbohydrate energy bars or non-caffeinated energy gels that are low in fat and protein digest rapidly and are a good source of quick energy.

Discouraged food & drinks on court:

1. Avoid cola drinks or other soft drinks:

They usually contain a large amount of sugar and the caffeine may act as a diuretic, which could increase your fluid output and may lead to more dehydration.

2. Avoid bananas:

They are slower to digest (low GI rating) and reduce your body's ability to absorb the essential fluids you are drinking to avoid dehydration.

3. Avoid fatty snacks such as a chocolate candy-bar:

They are slow to digest and will sit in your stomach causing a feeling of fullness and reducing fluid absorption by the body.

Post-Match Nutrition

After your match (or practice), your post-match nutrition becomes crucial for recovering from your energy depletion. The first goal is to rehydrate and resupply sodium.

Then glycogen stores can take 24-48 hours to refill; therefore, it is important to start replenishing carbohydrates immediately following exercise to accelerate the recovery process.

However, there may be very little appetite or opportunity to eat following a match. Drinking a liquid carbohydrate may be easier to consume and allows for glycogen replacement, restores lost electrolytes, and also promotes hydration. In addition, it is equally important to drink water since it takes three grams of water to store one gram of glycogen. Post-match protein intake in an easy to digest form, like a milk product or smoothie may be an ideal way to help your muscles to be able to immediately start to rebuild.

Within the first 30 minutes after your match:

Eat a large snack or medium portion dinner with 2 parts carbohydrates, 1 part protein, and sports drink or natural juices because:

- This is when your muscles are most effective at storing glycogen

- Your body is still using energy and burning calories

- Your cells are rehydrating

- A carbohydrate/protein energy bar or pasta/rice, lean meat, and a vegetable would be appropriate at this time.

Within 2-3 hours after your match:

Eat a well balanced meal including a variety of carbohydrate sources, a protein portion, and plenty of fluids because:

- Your body is still low on fluids, minerals, and energy

- What you eat at this time will restore most of the energy used during play

- Your muscles begin repairing any damage that may have occurred in the match

- A pasta/rice based meal with lean meat and vegetables with several glasses of fluid make an ideal post-match meal.

Within 24 hours after your match:

Continue to drink plenty of fluids and give your body a rest (if possible) because:

- It takes a while to fully recover from your match mentally and physically

- It often takes a while to fully replace the fluid you lost during a match.

- Your muscles need rest to store glycogen and repair themselves.

If a player has another match scheduled to begin shortly after the completion of play (i.e. within 1-2 hrs), rehydration and carbohydrate intake should begin immediately.

High-carbohydrate sport drinks, sport bars, and other high-carbohydrate foods with a high GI will facilitate the rapid restoration of muscle glycogen more so than other foods.

Finally, if sweat losses from the previous match were extensive, and especially if the player is prone to, or just experienced cramps, additional salt may be added to the diet.

Supplements

Due to the competitive nature of tennis and its physiological demands, it is not surprising that supplementation is often part of an athlete's training diet.

Dietary supplements may be used to provide the body with extra fuel before, during, and after training. However, supplements should be regarded with caution, for several reasons.

Not only are the long-term physiological effects of many dietary supplements not fully understood, but the supplement industry is largely unregulated, and so they are not subject to the manufacturing rigour that occurs in the food industry.

As such, there is no guarantee that the ingredients list on any supplement is accurate. Some supplements contain ingredients that are not listed on the label, or in different amounts than stated on the label. As such, there is no way to guarantee the safety and/or purity of these products.

Many athletes have produced positive doping tests as a result of ingesting supplements, including in tennis.

Under the strict liability principle adopted by the WADA Code (and so the Tennis Anti-Doping Programme), athletes are responsible for any substance found in samples produced by them, and so a contaminated supplement will not excuse a positive doping test. As such, the ITF does not recommend any supplement.

Any player who consumes a dietary supplement does so at their own risk. Players who consume supplements may be subject to sanctions under the Tennis Anti-Doping Programme.

Check always WADA prohibited list.

The consumption of any dietary supplement contaminated with a Prohibited Substance may subject a Player to penalties under the Tennis Anti-Doping Programme.

If you would like to check whether a supplement or medication contains a prohibited substance; please complete the 'Product Information Request' by following this link to the ITF Anti-Doping website. The completed form should then be sent to IDTM using one of the following methods:

• By email to: tennis@idtm.se

• By fax to: +46 8 555 10 995

• By registered post/courier to: IDTM, Stockholmsvägen 18, 181 33 Lidingö, Sweden

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