

Nutrition For Training and Competition

I. **Basic nutrition is best, no magic diets...Common sense prevails.**

❖ **The food you consume is the fuel you use.**

- ⇒ High Octane vs. Junk: Seek the best sources of energy available to you.
 - ✓ Milk products, lean meats, poultry, fish, dry beans, nuts, vegetables—raw leafy green vegetables & others cooked or chopped raw, fruits, and whole grains
- ⇒ Primary purpose of training: enable athlete to adapt physiological systems for optimal storage and use of that fuel.
 - ✓ Carbohydrate is the primary source of energy for a training athlete.
 - ✓ Carbohydrate is broken down into glucose stored in the muscle cells and in the liver on a limited basis as glycogen.
 - ✓ Glycogen is the major fuel source during moderate to high intensity exercise (workouts).
 - ✓ If daily carbohydrate consumption is not enough to replace muscle glycogen used during training, the athlete will not have enough fuel to continue to train properly.
 - ✓ The fatigue resulting from glycogen depletion keeps the athlete from maintaining a proper training schedule and ultimately will prevent them from competing at their maximal capacity.
- ⇒ It is important for the athlete to know what foods best provide this all-important energy, and how to balance his or her consumption of these foods.
 - ✓ Common carbohydrate-rich foods are:
 - Grains (rice, wheat, etc.)...Pasta, Bread
 - Vegetables...Broccoli, squash, carrots, peas, green beans, baked or boiled potatoes, etc.
 - Fruits...apples, strawberries, blueberries, bananas, oranges, kiwi, watermelon, grapes, raisins, apricots, papaya, etc.

II. **The Balancing Act**

- ❖ Consume an adequate number of calories geared to activity level.
- ❖ **60% of calories should come from carbohydrate, 25% from fat, 15% from protein**
- ❖ **Carbohydrate consumption is the key for the training athlete.**
 - ✓ Determine how many carbohydrate grams you need by multiplying your weight in pounds by 5.
Example: 150 lbs. of body weight \times 5 = 750 grams of carbohydrate
 - ✓ Next, determine how many calories from carbohydrate you need to consume daily: Multiply the total number of calories consumed daily by the percentage of carbohydrate calories needed—60%.
Example: 5000 total calories \times .60 = 3000 carbohydrate calories needed.
 - ✓ Then divide the carbohydrate calories needed by 4 to get the number of carbohydrate **grams** to be consumed daily (carbohydrates provide 4 calories per gram).

Example: 3000 carbohydrate calories divided by 4 = 750 carbohydrate grams needed.

- ⇒ Athletes need to learn to read labels to determine the breakdown of the foods they consume.
- ⇒ May also consult: *Bowes and Church's Food Values of Portions Commonly Used*, published by Pennington and Church, Philadelphia, J.B. Lippincott, Co., 1989.
- ⇒ Many athletes will be shocked to discover their diets include less than 50% carbohydrate...this is not uncommon among even the best athletes.
- ⇒ Their performance will improve when they start monitoring, taking control, and improving their intake of carbohydrates.

❖ **Protein Balance**

- ⇒ Protein is necessary to build, maintain, and repair body tissue. This is important for training athletes because they are constantly breaking down muscle tissue with the intent that it will be rebuilt stronger and larger.
- ⇒ Protein aids in the production of hemoglobin, which carries oxygen to the exercising muscles.
- ⇒ Protein provides essential enzymes and hormones to regulate the body processes, warding off infection and disease.
- ⇒ If a swimmer's diet is not balanced, or if total daily caloric intake is insufficient, protein will be broken down and used as an energy source (instead of being used for its intended job of tissue rebuilding).
- ⇒ Recommended dietary allowances suggest a range of protein requirements between 0.8 to 2.0 grams of protein per kilogram of body weight.
- ⇒ Amount of protein in foods:
 - ✓ 8 grams of protein are in 1 cup of milk, yogurt, or 1 ounce of cheese.
 - ✓ 7 grams of protein per ounce of meat (beef, chicken, fish)
 - ✓ 3 grams of protein per serving of bread or grains (1 slice of bread, ½ cup of rice, ½ cup of pasta)
- ⇒ Problems with consuming too much protein (important to stick to the guideline of 15% of calories coming from protein):
 - ✓ Excess protein can be converted to fat, and foods high in protein may contain more fat.
 - ✓ Too much protein in the diet may inhibit the replacement of muscle glycogen.
 - ✓ Too much protein may also lead to dehydration, as more water is required to eliminate the extra nitrogen accumulated.

❖ **Fat Budget**

- ⇒ Although fat is an energy source, athletes are advised to limit fat in their diets, as even the leanest of athletes have more body fat than is needed during a workout.
- ⇒ No more than 25-30% of the total daily calories should come from fat.

- ✓ Fat takes longer to digest than protein and carbohydrates, so you are advised to consume minimum amounts of fat before and during exercise.
 - ✓ Consuming a high-fat diet compromises carbohydrate intake which may lead to chronic fatigue.
 - ✓ In order to burn fat as a fuel source, the body must have sufficient carbohydrate levels to use fat effectively as energy.
- ⇒ It is best if you can limit your diet to low-fat foods.
- ✓ Becoming familiar with high-fat foods and not exceeding one's fat budget will help the athlete eat more carbohydrates and less fat, so he or she will have the energy to train and become a better athlete.
 - ✓ One's fat budget is the amount of fat one can reasonably eat each day and meet current dietary guidelines that 30% of calories *or less* comes from fat.

III. Frequency: Never go more than four hours without eating!

- ⇒ Knowing when to eat is as important as knowing what to eat.
- ✓ Spread carbohydrate intake out over the course of the day, with smaller, more frequent meals and snacks
 - ✓ Eat *some* carbohydrate before morning practice (can be in the form of juice).
 - ✓ Consume carbohydrate in the form of carb-electrolyte drink during workout if workout is 90 minutes or longer. (Gels are also acceptable).
 - ✓ Eat carbohydrate and protein within the first 30 minutes after practice.
 - Four parts of carbs to one part of protein helps the re-load. (A cereal bar, low-fat cheese, "meals in a can," or even chocolate milk can fill this role).
 - Triggers metabolism and initiates recovery process early and effectively.
 - Enables body to replenish glycogen stores and repair muscles tissue.
 - Recommended carb intake is 1.5 gram/kg body weight during first 30 minutes after intense exercise, and again every 2 hours for 4 to 6 hours in order to replace glycogen stores.
 - This 30 minute period after practice may be the most important *time* to eat for a training athlete!
 - ✓ Eat something substantial (a real meal) within two hours after practice is over. (That is, when swimmer is hungry...their appetites are suppressed when their bodies are warm, like right after practice.)
 - **This meal is critical to maximizing recovery!!!**
 - ✓ Incorporate fat into the day at times that are not close to workout.
 - Fat is necessary, but contributes little to the workout or the immediate post-workout recovery period.

IV. Training well and recovering adequately begin with proper hydration.

- ❖ Guidelines for proper hydration:
 - ✓ Before practice or competition: 12 to 20 ounces 2-3 hours before
 - ✓ During practice or competition: 6 to 12 ounces every 15-20 minutes...drink throughout practice (water, Gatorade, etc.)
 - ✓ After practice or competition: Drink 150% of sweat-loss, i.e. Drink 3 cups (24 oz.) pr pound of weight loss
 - ✓ Two “gulps” equals about 3 ounces
 - ✓ Replace 70% of loss (measured by weight loss) before the next practice, i.e. 2 pounds lost equals 6 cups to replace fluids

V. Vitamin and Mineral Supplementation

- ❖ Studies indicate that supplementation is only warranted when there are deficiencies.
 - ✓ Vitamins and minerals are generally supplied sufficiently by a well-planned, adequate diet.
 - ✓ The effects of adding extra amounts of vitamins and minerals through supplements to an already sufficient diet may be minimal.
- ❖ Iron supplementation
 - ✓ Endurance athletes, especially women, may benefit from iron supplements.
 - ✓ Encourage athletes to eat iron-rich foods such as meat, fish, poultry, dark leafy green vegetables, whole grains, and legumes.
 - ✓ Recommended intake for competitive, iron-sufficient athletes is 17.4 mg/day for males and 23 mg/day for females.
 - ✓ Iron deficiency can interfere with the adaptive response to training by preventing performance at true maximal intensities.
 - ✓ At sub-maximal intensities, the efficiency of the body suffers, which translates to a lower quality workout.
 - ✓ Iron deficiency seems to occur more often with female athletes. Know your athlete’s iron status.
 - ✓ Again, improving an athlete’s iron status from deficient to sufficient is clearly warranted and beneficial, but the effects of simply adding iron to an iron-sufficient diet may be minimal.
 - ✓ Replenishment of iron stores takes time (6-8 weeks)
 - ✓ Revision of diet should be adequate to address to problem, dietary supplements are not necessary in most cases.

VI. Special Considerations Before and During Competition

- ❖ Fuel-up properly before competition for optimal performance.
 - ⇒ During the intense efforts required during a swimming race, the muscles will be running almost exclusively on the fuel supplied by carbohydrates.
 - ⇒ Improper daily diet cannot make up be rectified with a good pre-meet meal
 - ⇒ “Carbo-loading” means consuming a higher percentage (70% as opposed to the normal 60%) of carbohydrates for 2-3 days prior to the competition.

- ✚ For major competitions, when athletes are tapered, they may actually reduce their carbohydrate intake to 50% six days before the meet starts, and then increase it to 70% for the last three days.
- ✚ This regimen allows the trained athlete to increase glycogen stores by 2 to 2.5 times, meaning they will be able to perform more intensely for a longer period of time before exhaustion sets in.
- ✚ It is challenging to consume 70% of carbohydrates without also adding bulk...high-carb drinks are very useful in this regard to supplement carbohydrate intake.

⇒ Several (1-4) hours before competition, the athlete should eat a satisfying meal of familiar foods That meal should be low-fat, carbohydrate meal of 300-600 calories of carbohydrates (70% of the total for the meal)...pancakes, waffles, cereals (oatmeal is very good!), bagels or toast, fruit, fruit juices are all recommended.

- ✓ Keep protein content to no more than 10-15% of calories.
 - ✚ Protein foods take longer to digest and increase urine output, which can lead to increased dehydration.
- ✓ Stay away from foods that are high in fiber and fructose...unless the athlete wants to be searching for a restroom in the middle of a long race.
- ✓ Stay away from fatty foods...fried foods, doughnuts, cheeses, lots of butter or cream.
- ✓ Some athletes must experiment with the timing of this meal, but try to move it as close as possible to the start of the event, allowing for time to digest the meal well. This is an individual matter.
- ✓ Athlete should compete on a relatively empty *stomach*, but he or she does not want to feel hungry or weak on the starting blocks.

⇒ During competition swimmers must supply energy from carbohydrates to maintain glycogen stores.

- ✓ Small, carbo-rich snacks between races...300-500 calories
 - ✚ Liquid food supplements and energy bars are good for this
 - ✚ Athlete must read the labels on such products to know what they are consuming

⇒ During competition swimmers must stay hydrated.

- ✓ Plain water is fine
- ✓ Body will absorb more fluid from a sports drink containing electrolytes like sodium.
- ✓ Athletes will consume more fluids if the beverages are flavored
- ✓ They should avoid drinks that contain a large amount of fructose.
- ✓ Cool fluids are better during competition since they empty from the stomach faster than warm fluids.

VII. Summary:

❖ Ten Tips on Nutrition for Athletes

- 1) Do what you know you should do...make the wise choices to fuel your engines.
- 2) You must eat breakfast (oatmeal!).
- 3) You must eat lunch.
- 4) Eat a snack before practice.
- 5) Drink throughout the day.
- 6) Drink a sports beverage during practice and at competitions.
- 7) Eat or drink a carbohydrate-rich food with some protein within 30 minutes of the end of practice.
- 8) Eat a substantial meal two hours after practice or competition.
- 9) Eat at home more often.
- 10) Never, ever, show up for practice or a meet on an empty tank!

❖ Be Responsible

- ⇒ Nutrition and hydration is completely under the athlete's control.
- ⇒ Athlete should keep a record of meals and snacks, especially before competitions.
 - ✓ Everyone is different, and finding the best regimen will come from individual experimentation.
 - ✓ Keep track of foods eaten, timing of consumption, and the effects prior to and during the events.
- ⇒ Nutrition and hydration are extremely important to an athlete's success, affecting both training and competitive performance.