

Nutrition and the Athlete

Because restrained eating and induced dehydration are counterproductive to the athletes' ultimate goals, may be dangerous, and may lead to more serious eating disorders, they are inappropriate strategies for power athletes to follow. Instead, athletes should consider eating strategies that optimize performance and hydration state. To do so requires a meal pattern that includes six or more eating opportunities. This is a distinct separation from the usual three-meals-per-day eating pattern and, because of this, may be difficult to accomplish (people tend to eat in the way most around them eat). Nevertheless, the rewards of having smaller and more frequent meals are real. **Athletes who practice eating smaller and more frequent meals and who drink frequently are likely to feel better and do better**, a fact that is likely to encourage them to continue eating in this way.

Football players should enter the game with their muscle glycogen levels full. However, even with muscle glycogen storage at its peak, a player cannot play an entire game without depleting muscle glycogen in specific muscle groups.

This loss of body fluid negatively affects cooling ability, athletic performance, and concentration. A study of the consumption of carbohydrate-containing beverages among football players showed that these beverages were better able to maintain plasma volume than water alone. Since maintenance of plasma volume is strongly associated with athletic performance, football players should take every opportunity to consume a carbohydrate-containing beverage during breaks in the game.

Linemen or athletes trying to gain size - Although high mass affords linemen a clear advantage, the ability to move the mass quickly is equally important. Therefore, linemen should strive for a high level of muscle mass rather than just higher weight. To achieve this, consumption of a diet that meets the energy requirements plus 300 to 500 calories for the higher mass is needed, along with a relatively low intake of fat (less than 25 percent of total calories) and a moderate intake of protein (12 to 20 percent of total calories, or about 1.7 grams of protein per kilogram of body weight). This type of diet, coupled with exercise protocols that places stress on the muscles, helps enlarge the muscle mass.

Backfield defensive positions, pass receivers, and field players from sports utilizing significant mobility require high agility, speed, and quick reaction time. High speed and agility require a relatively low level of body fat. Therefore, these football players should have an eating pattern that limits fat storage (i.e., a high-carbohydrate, low-fat intake consumed in small, frequent meals). Since multiple 40-yard sprints down the field to catch (or defend against) long passes will quickly deplete muscle glycogen storage, consumption of carbohydrate-containing beverages at natural breaks during the game is desirable. During hot and humid days, consuming these beverages will also enhance the ability to maintain a desirable hydration state.

Carbohydrates from most any athlete are essential and the greatest quantity of nutrition will come from this category (50%-65%). In the general press CHO has gotten a bad rap in recent years. The issue an athlete will want to watch out for is where those CHO's come from. Fruits and vegetables are great sources of carbs and include quantities of fiber which is encouraged as much as possible. Processed and white flour based foods, not so much.

Repeated high-intensity activity while wearing equipment (e.g., pads, helmet) translates into high sweat losses. The fluid in sweat must be replaced to maintain optimal performance. To do this, consumption of sports beverages that contain a 6 to 7 percent carbohydrate solution (think Gatorade not juice) is useful for maintaining the body's water level and replenishing carbohydrate fuel. Athletes typically place themselves in a state of voluntary underhydration, so there is every reason to set up a strategy that makes football players consciously consume fluids during every possible break in the game.

A study of college football players found that **supplementing with creatine** monohydrate had a performance-enhancing effect by improving lifting volume and repeated sprint performance. Another study of football players found that creatine supplementation was useful for enhancing peak force and maximal strength.

In one of the few studies assessing the safety of long-term creatine supplementation, creatine monohydrate showed no long-term detrimental effects on kidney or liver function in the absence of other supplements.

Resistance training athletes have an increased need for dietary protein, particularly at the beginning of a new training program. However, since the maximal rate of protein utilization appears to be about 1.7 grams per kilogram of body weight (an amount about double the reference intake for nonathletes), only a subtle change in diet would be needed to achieve this level of intake. In fact, most people (athletes and nonathletes alike) already consume protein at a level at or above the recommendation for athletes.

Adapted from - Benardot, Dan (2012-01-13). *Advanced Sports Nutrition: Second Edition* (Kindle Locations 4657-4662). Human Kinetics. Kindle Edition.

Nutrition Timing for Exercise:

The goal for athletes in the pre-exercise period is to make certain that blood sugar is maintained, that hydration state. To do this, the focus should be on starchy, low-fiber carbohydrate foods and fluids for the last meal before exercise, followed by a sports beverage sipping protocol that maintains blood glucose and volume.

Perhaps the most common error during physical activity is to delay drinking fluids until the sensation of thirst manifests itself.

Before Exercise A high-carbohydrate snack/meal that is completed approximately 90 minutes before physical activity has been shown to improve endurance performance. After this pre-exercise meal, athletes should consume carbohydrate right up to the beginning of the training session or competition to avoid low blood glucose. Two strategies can be followed:

1. Ingest a carbohydrate-containing sports beverage using a sipping strategy, where approximately 2 to 4 ounces (60 to 120 ml) of beverage is consumed every 10 to 15 minutes.
2. Snack on low-fiber, starchy foods (such as saltine crackers) every 15 minutes, washed down with ample quantities of water.

During exercise carbohydrate is best obtained through a 6 to 7 percent carbohydrate solution, with 4 to 8 ounces (120 to 240 ml) with the addition of up to 6 gram essential amino acids taken every 10 to 20 minutes (the amount to consume depends on sweat rate).

After Exercise Glycogen and fluids are usually, to a degree, depleted after exercise, and protein requirements are also higher to aid in muscle recovery. One of the main post-exercise goals is to replenish glycogen to prepare the athlete for the next bout of exercise. Therefore, athletes should consume carbohydrate as soon as physical activity ends. Ideally, the carbohydrate consumed for the first 2 hours after exercise should be high glycemic, followed by medium-glycemic carbohydrate for another 2 hours and finally low to medium-glycemic carbohydrate for the remainder of the day. (Glycemic index foods of ≥ 70 are considered high; 56 to 69 is considered medium; and ≤ 55 is considered low.)

Protein is composed of amino acids, the same building blocks of human muscle. In a post-workout nutrition window, consuming 25 to 40 g of lean protein or whey protein powder, with two to four times that amount of simple carbohydrates, to ensure rapid delivery to the muscles will provide a better return on your investment in weight training. That equates to 100kcal to 160kcal of quality protein and 200 to 540 kcal from carbohydrate (50 to 100 grams) immediately after physical activity.

Even a subtle delay in food consumption after activity may negatively affect the immune system as well as leave the body in catabolic state long enough to negatively affect the workout.

Chocolate Milk as an Effective Recovery Beverage

- Satisfies - fluid and sodium for rehydration, sugar for glycogen replenishment, and protein for reducing postexercise muscle soreness.
- Reduces exercise-associated muscle damage and improve post-exercise recovery

“Eat First – Then Maybe Supplement”

Here are the recommendations that recently released in an article by the American Council on Exercise. Two highly respected speed coaches were part of making this recommendation and is not specific to the football athlete:

1. Drink lots of water—an athlete should daily consume at least 1 ounce of water for every 2 pounds of bodyweight.
2. Eat at least three meals daily—ideally, five to six.
3. Eat primarily whole, not processed, foods; avoid preservatives.
4. If it comes out of the ground, eat it.
5. Minimize sugar intake, especially from soft drinks.
6. Eat 0.8 grams per kilogram of bodyweight of lean protein: chicken, fish, turkey, lean cuts of red meat and eggs.
7. Ask parents to consult a dietitian for their child to ensure he or she has no food allergies or other diet-related issues.

Now that’s a pretty safe view and anything beyond that is generally referred to a dietician as certain medications and medical conditions can be an issue with dietary nutrition (the chemistry of food may not mix well). Consult your physician if there are any similar concerns for you.

In response and addition to the above...

1. Hydration is very important – yes.
2. 3 meals are a minimum and would suggest 2-3 good protein/carb loaded snacks as well. Most important snack is the one that is 30 minutes or less after the workout.
3. Whole food = good.... If he can just stay away from the soda and fast food your way ahead.
4. 'Ground' food = veggies... no limit (carbs, fiber, vitamins, and minerals – as many different colors as you can stomach)
5. Less white sugar = good (reduced whites salt & flour based foods good too)
6. Protein... the .8 g/kg recommendation fits a non athlete. An athlete is suggested and backed by science to go with 1.2-1.7 grams per kg body weight. This is usually easily supplied by the American diet. That math can be ugly, so just above the high end is 1g per pound of bodyweight. Stay just below that and you're in the ball park.
7. Yes, any questionable medical issues... talk to a doc and possibly a dietician.

And now with that said...

- Multi vitamin – mixed studies on benefit, but it's cheap and helps meet the basics with a standard vitamin, probably a good supplement to cover bases.
- Fish Oil – Some attention has been given to the potential benefits of omega-3 fatty acids for athletic performance. 2 g of this supplement is a good goal.
- Protein – Like I said, most get plenty, but that post workout thing is an ideal time to add protein in shake form that is absorbed quickly. About 30 grams of whey is perfect with a meal following 1-2 hours after. With that 20-40 grams should be about 80-160 grams of carb... this does not have to be a powder. PB & J sandwich can fit this bill pretty close, so can chocolate milk, low fat yogurt & cottage cheese and almonds.
- Essential Amino Acids – during exercise of any significance it is now recommended that a sport drink (Gatorade) not just water be taken. During strength training that drink could have added up to 6 grams of AA's as well.
- Creatine – this one requires a load phase, a daily dose, and most current suggestions is an off load once per month. Your body can only hold so much CP, so if you are loaded from all the red meat you eat, it may have little to no affect. Unless doctor says otherwise, you can generally consume and see how your short bout energy feels after taking for a month... It adds CP so that you have more available when your body is trying to replace ATP to your phosphogen energy system.
- Other items like HMB and L-Glutamine (and a few others) have shown positive affects, but not consistently in scientific testing. Marketing for them is often great, but that's about it.

So...

1. Eat well and often
2. Timing of snack post exercise is important (possible Pro/Cho Drink)
3. Use sport drink during competition and with EAA during strenuous exercise
4. Again, Eat well as this alone will improve performance for most teens.
5. Basic Multi Vitamin daily
6. Fish Oil may be a great general health and athletic supplement.
7. Creatine per label directions (if necessary)