

RENEGADES

Volleyball Club

Health & Nutrition Guide

Renegades Volleyball Club offers this packet as a guide only. We are not engaged in rendering medical advice or services. Please consult your doctor prior to any radical change in your diet or exercise plan. Healthy eating will only help, when used with a steady exercise plan.

Renegades Volleyball Club: Health & Nutrition Guide
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RENEGADES

BASIC NUTRITION

Basic Nutrition

Sports nutrition, or eating for optimal athletic performance, does not differ much from sound nutritional practices for the average person. The only real differences concern carbohydrate consumption, adequate fluid intake, and electrolyte balance. The Food Guide Pyramid is a good place to start analyzing what you need for ideal athletic performance, recovery, and health.

The Food Guide Pyramid divides food into six different categories: Grains; Vegetables; Fruits; Dairy; Meat and Proteins; and Fats, Oils, and Sweets. Below you will find an example of the Food Guide Pyramid, as well as a listing of the foods included in each category, the recommended number of servings, and serving sizes.



Grains (bread, cereal, rice, pasta): **6-9 servings** (1600-2200 kcal) per day

1 serving = 1 slice of bread; 1 c. ready-to-eat cereal; 1/2 c. cooked cereal, rice, or pasta. Try to choose whole grains, such as brown rice, oatmeal, whole oats, bulgar (cracked wheat [tabouleh]), popcorn, whole rye, graham flour, pearl barley/whole barley (often found in soup), whole wheat (bread, low-fat whole wheat crackers), whole grain corn, whole grain ready-to-eat cereal, bran cereal, oat bran, bagels (pumpernickel, rye, whole wheat), whole grain muffins (bran, corn, oat bran), whole grain and dark breads (dark rye, whole wheat), stoned wheat and whole grain crackers.

Vegetables: 3-4 servings per day; 1 serving = 1 c. raw leafy green vegetables; 1/2 c. other vegetables, cooked or raw; 3/4 c. vegetable juice. Good choices from the vegetable group include: green peppers, tomatoes, tomato sauce, cruciferous vegetables (cabbage, broccoli, cauliflower, brussel sprouts), and greens, such as spinach, bok choy, collards, kale, kohlrabi, mustard greens.

Fruits: 2-3 servings per day; 1 serving = 1 medium apple, banana, orange, or pear; 1/2 c. chopped, cooked, or canned fruit; 3/4 c. fruit juice. Try to choose citrus fruits and juices, bananas, cantaloupe, kiwi, strawberries, dried fruits.

Dairy (milk, yogurt, cheese; preferably fat-free or low-fat): **3 servings per day;** 1 serving = 1 c. milk, yogurt; 1.5 oz. natural cheese (cheddar); 2 oz. processed cheese (American). ***Note:** this group is a large source of calcium, which is essential for healthy bones (fracture resistance), and calcium also plays a role in muscle contraction. Good choices include: low-fat and skim milk and yogurt, low-fat cheese, dark green vegetables (broccoli, bok choy, kale).

Meat and Proteins (meat (preferably lean or low-fat), poultry, fish, dry beans, eggs, nuts): **2-3 servings per day (5-6 oz.);** 1 serving = 2-3 oz. cooked lean meat, poultry, fish; 1 c. cooked dry beans; 1 c. tofu; 2 (2.5 oz) soyburgers; 2 eggs; 4 tbsp. peanut butter; 2/3 c. nuts. Good choices include: lean beef (“round” in the name (top round roast and steak, bottom round roast, eye of round, round tip) often signifies a lean cut of beef), boneless rump roast, tip roast and steak, strip and flank steak, lean stew beef.

The leanest cuts of pork include: sirloin roast and chops, loin chops, top loin roast, tenderloin, cutlets. The leanest cuts of ham are: lean and extra-lean cured ham (labeled 93 – 97% fat free), center-cut ham, Canadian bacon. Other good choices from the Meat and Proteins group include: chicken (skinless), turkey (skinless), fish (salmon, albacore tuna, swordfish, sardines, bluefish), peanut butter, canned beans, tofu (soybean curd).

Fats, Oils, Sweets: the recommended amount of fat in an athlete’s diet is **20-25% of the daily total caloric intake from fat.** The recommended amount of sugar in the diet is **10% of the total daily caloric intake from sugar** (1 g sugar = 4 calories).

Recommended sources of fat include: oils (olive, canola, peanut, safflower, sunflower, corn, cottonseed; all are sources of unsaturated fats, the “good” fats), and nuts and seeds, such as walnuts and sunflower seeds. Reasonable sources of sugar include molasses, honey, berry jams, and syrups (such as maple).

Below you will find information concerning how to apply the Food Guide Pyramid to your training and competition diet.

Carbohydrate

The Grains, Vegetables, and Fruits categories are the predominant sources of carbohydrate. Carbohydrate is important because carbohydrate is metabolized by the body to form glycogen (stored in the muscles and liver), and glucose. Glycogen stored in the muscles provides the fuel needed by the cell’s mitochondria to produce energy. In

the case of a muscle cell, glycogen provides the energy need for muscle contraction to occur.

Glucose provides energy to the central nervous system (the brain and spinal cord). When blood sugar runs low, hypoglycemia occurs. Hypoglycemia is characterized by fatigue, restlessness, irritability, impaired decision making and cognitive functions, blurred vision, light-headedness, and weakness; not exactly the best condition to play hockey in.

Carbohydrates provide four calories of energy per gram of carbohydrate, and should comprise **60-70% of your daily caloric intake (3-7 g carbohydrate per kg body weight)**; to determine your bodyweight in kilograms, divide your bodyweight in pounds by 2.2). Carbohydrates are extremely important for optimal hockey performance because carbohydrate is the only fuel that can be used by the body for short, intense periods of activity. Short, intense bouts of activity use carbohydrates as the primary energy source because carbohydrates can be utilized for fuel without oxygen being present. During short, intense bouts of work, such as in hockey, the lungs cannot keep up with the oxygen demands of the cells. Carbohydrate can be used as a fuel source until adequate oxygen is available.

Carbohydrates are sometimes classified as simple and complex. Sources of simple carbohydrates are sugars, so candy and pastries are rich in simple carbohydrates. The best sources of complex carbohydrates include whole grains, fruits, and vegetables. Complex carbohydrates are better fuel sources than simple carbohydrates because complex carbohydrates often also contain fiber, which slows the absorption of glucose by the cells. A slower rate of glucose absorption by the cells results in a steady stream of energy being available for the body to use. If you have trouble maintaining bodyweight during training/season, try increasing your carbohydrate intake by 67.5 – 81 g (270 – 324 calories from carbohydrates). This is the recommended amount of carbohydrate needed for games and practices. *If you are trying to lose weight, decrease the amount of fat and simple carbohydrates (sugars) in your diet, not your complex carbohydrates!*

Carbohydrates do not make you fat! It is the additions you make to carbohydrates (butter, mayonnaise, cream cheese, etc.) that contribute excess calories that can lead to weight gain.

The Glycemic Index: what it is, and why it is important. The glycemic index represents the extent to which a food causes an increase in blood sugar after ingestion of the food. Why is this important? An increase in blood sugar causes the pancreas to release insulin into the bloodstream, which in turn causes the cells to take up the sugar. An “insulin overshoot” occurs (more insulin is released than is necessary, due to the sudden increase in blood sugar), and consequently, low blood sugar results. Low blood sugar is characterized by feelings of weakness, dizziness, fatigue, impaired decision making, and, in some cases, visual disturbances. Not exactly the way you want to feel during a game.

The glycemic index tends to be lower for foods that are minimally processed, high in fiber, and are ingested along with fat and protein (so a small amount of protein and fat is ok to consume with the pre-game snack/meal). Consumption of high glycemic index foods soon after exercise will probably help promote the restoration of muscle glycogen (extremely important when you only have 24 hours of recovery during a weekend series, as well as for daily practice).

Foods with a **low glycemic index** (what you would want to consume if eating within 1-2 hours of practice/game) include:

- *Grains*: barley
- *Fruits*: plums, apples, peaches, pears, banana, grapefruit, dried apricots
- *Dairy*: skim milk, whole milk, chocolate milk, low-fat fruit yogurt
- *Legumes/dried beans* (if tolerated): chick-peas, lima beans, yellow split peas, lentils, kidney beans, green beans
- *Others*: pasta (spaghetti); nuts

Ideas for pre-game low glycemic meals or snacks include:

- Fructose-sweetened yogurt with walnuts and apples
- Lentil soup with rice
- Peanut butter on rice cakes, and a plum
- Rice pudding with milk, cinnamon, raisins, and maple syrup (for sweetness)
- Smoothie made with yogurt, milk, frozen peaches
- Cheese ravioli
- Red beans and rice

Some individuals may not be as sensitive to fluctuations in blood sugar as others, and therefore may be able to tolerate moderate glycemic foods, without their performance being affected. The best way to determine how a food is going to affect your performance is to try it, *but not before a game!* Try it before a practice and see how you feel.

Foods with a **moderate glycemic index** include:

- *Grains*: rice (parboiled white rice, white long grain rice, brown rice), bulgur (cracked wheat [tabouleh])
- *Breads*: wheat bread, pumpernickel bread, bagel, bran muffin
- *Cereals*: high fiber (All-Bran, Bran Chex)
- *Vegetables*: sweet potatoes, boiled potato, corn, green peas
- *Fruits*: orange, orange juice, apple juice
- *Others*: crackers, popcorn, rice cakes, potato chips, cakes/cookies (pound cake, vanilla wafers), ice cream, baked beans

Protein

The Meat and Proteins and Dairy categories provide the majority of protein consumed in the diet. Protein is important because protein is used to build and repair skeletal muscle, organs, and bone tissue, and to a lesser extent, is a component of enzymes, antibodies, lipoproteins, hormones, hair, fingernails, and the hemoglobin in red blood cells. Like carbohydrate, protein provides four calories of energy per gram of protein. However, oxygen is needed for protein to be used as fuel, making protein a less than optimal energy source for hockey. In the body, muscle is the storage site for protein.

Protein metabolized for energy comes from the breakdown of muscle. A loss of muscle tissue causes the metabolism to slow down, resulting in burning less calories even at rest.

Protein should account for 10-15% of the total daily caloric intake, or 0.8 g – 1.5 g of protein per kg of body weight (0.4 g – 0.9 g of protein per pound of body weight). High protein diets are not recommended as a method of weight loss for athletes.

High protein diets do not meet the carbohydrate requirements of athletes. As stated above in the “Carbohydrate” section, carbohydrate is the optimal energy source for performance of high-intensity activities, because carbohydrate can be used as a metabolic fuel without requiring oxygen for metabolism. In contrast, protein cannot be metabolized for fuel without oxygen. Sources of protein also tend to be high in fat. Excess protein is broken down into urea and excreted in urine via the kidneys, which in turn can cause unnecessary strain on the kidneys. The excretion of excess protein in the urine can also contribute to dehydration, and cause inconvenient trips to the bathroom during training/competition.

Fats

Fats provide nine calories per gram of fat, and should comprise **less than 30% of the total daily caloric intake**. Because of the high percentage of carbohydrate recommended in an athlete’s diet, the amount of fat in your diet should be about 20-25%.

Important functions of fat within the body include: fat stored in the body as adipose tissue provides an energy source; body fat is necessary for insulation and protection of organs, and hormonal regulation; fat is the carrier of and storage site for the fat-soluble vitamins A, D, E, and K; and fat is responsible for the formation of healthy cell membranes, proper development and functioning of the brain and nervous system, and production of hormones. Dietary fat provides essential fatty acids the body cannot produce, which are needed for part of the cell membrane. Essential fatty acids also help regulate cholesterol metabolism, and are precursors for hormone-like compounds that help regulate physiological processes. Fat is important in food because fat provides taste, flavor, aroma, and texture to food, and promotes a feeling of fullness (satiety)

after a meal (important so you do not overeat). One teaspoon of oil provides 4g fat (36 calories); one tablespoon provides 120 calories (~13 g fat).

Water

In blood, water transports glucose, oxygen, and fats to the working muscles and carries away metabolic by-products such as carbon dioxide and lactic acid. In urine, water eliminates waste products. In sweat, water dissipates heat through the skin. In saliva and gastric secretions, water helps digest food. Throughout the body, water lubricates the joints and cushions the organs and tissues.

The human body requires 2.0 – 2.7 quarts (1.9 - 2.6 L, 60.8 – 83.2 fl. oz.) of fluid per day to replace the volume lost from urine, insensible loss from the skin and lungs, and loss in feces. **This volume does not take into account the volume of fluid lost through sweating during the performance of physical activity!** Therefore, your fluid intake must be more than the required 2.0 – 2.7 quarts.

With regard to training for and competing in sport, there are three goals for hydration: *(1) start in a hydrated state; (2) maintain that hydration; and (3) rehydrate before the next game/practice.* How do you accomplish these three goals? Follow these recommendations:

Weigh yourself before and after the game/practice. Each pound lost is equal to 1.0 pint (16 fl. oz./0.5 L) of fluid loss. After the game/practice, replace the weight you have lost with the proper amount of fluid. **If you have not re-gained the weight you lost during the game/practice within 24 hours or the next game/practice, you are not adequately hydrated, and your performance will suffer!** This is especially important when you have weekend series games, and practices two days before games.

A 5 - 10 lb. weight loss in one week can be a sign of chronic dehydration. Other signs of dehydration or inadequate fluid replenishment include: dark yellow, strong smelling urine (normal urine is the color of lemon juice or straw; urine may be bright yellow if taking supplemental vitamins, and some foods can cause urine to be brighter in color); decreased frequency of urination; rapid resting heart rate; and prolonged muscle soreness.

2 hours pre-practice/game: consume at least 1 pint (16 fl. oz./0.5 L) of fluid (water, milk, juice, or sports drink; no caffeinated, carbonated soda, or caffeinated coffee, coffee drinks, or tea).

During game/practice: 6-8 fl. oz. every 15 minutes.

Rehydration: see the first recommendation above, “Weigh yourself before and after the game/practice.” Don’t overlook food as sources of water, but don’t rely strictly on food either. Foods having a high water content include: lettuce, tomatoes, oranges, celery, kiwi, grapefruit, tangerines, plums, peaches, mango, cucumber.

Electrolytes

Electrolytes play a fundamental role in the regulation of water distribution in various compartments of the body. Any disturbance in the balance of electrolytes in body fluids could interfere with performance. Therefore, it is important to replenish the electrolytes lost in sweat during the performance of activity. Sodium has a major influence on fluid regulation, and potassium, chloride, and magnesium are essential to muscle contraction and nerve conduction.

Sodium

Sodium helps maintain proper fluid balance between water in and around cells. Sodium is also involved in nerve conduction, cellular metabolism, and maintenance of blood volume and pressure. One pound of sweat contains 400-700 mg sodium. Over the course of 2-3 hours you can lose 1800-5600 mg sodium. **The recommended sodium intake per day is 1,000 mg per day** (1 tsp. salt = 2300 mg sodium).

Potassium

Potassium is involved in maintaining normal water balance in the body, and thus plays a role in hydration status. **The recommended daily intake of potassium is 2-6 g per day, or 3500 mg per day.** From 85 to 105 mg of potassium can be lost in one pound of sweat. Signs of potassium depletion include: impaired nerve conduction, which causes you to move slower; muscular weakness; and cardiac rhythm abnormalities.

Foods high in potassium include:

- *Breads*: whole grain (whole wheat) and dark breads
- *Cereals*: bran cereals (All-Bran, 100% Bran, Bran Buds, Bran Chex); whole grain cereals (oatmeal)
- *Vegetables*: baked white or sweet potato; pumpkin; rhubarb; winter squash; cooked greens (spinach); boiled broccoli, celery, parsnips, kale, and zucchini; brussel sprouts; raw carrots; avocado; tomato.
- *Fruits*: banana, plantain, dried fruits (apricots, prunes, raisins), raw apricots, apricot nectar, melon (cantaloupe, honeydew), kiwi, mango, citrus fruits and juices (oranges, orange juice, tangelos), pears, pineapple, pineapple juice, strawberries, peaches
- *Dairy*: milk, buttermilk, cottage cheese (2% fat), yogurt
- *Meats*: beef, lamb, pork (except bacon), turkey, veal
- *Fish*: bass, carp, catfish, flounder, cod, haddock, halibut, herring, perch, pike, pollack, red snapper, salmon, sole, tuna
- *Beans, legumes, lentils*: cooked dry beans/legumes/lentils; baked beans
- *Nuts and Seeds*: almonds, chestnuts, peanut butter, pistachios, soybean nuts, sunflower seeds

Chloride

Chloride consumed in the diet will usually be in the form of sodium chloride (table salt), and the salt present in processed foods.

Magnesium

Magnesium helps nerve conduction and muscle function (this again relates to your quickness). Sources of magnesium include: bran (wheat and rice); cocoa powder; fortified breakfast cereals; seeds (pumpkin, sunflower); soybeans; nuts (almonds, pine nuts, hazelnuts, cashews, walnuts, peanuts); spinach.

Iron

Iron is a component of hemoglobin, the protein in red blood cells that transports oxygen from the lungs to the working muscles. Blood loss is the primary means of iron loss from the body. Women are especially at risk for iron deficiency, and consequently anemia, because of blood loss during menstruation. **Any menstrual irregularities (either heavy periods or cessation of menstruation) should be investigated by a physician.** Iron deficiency (anemia) causes an individual to feel tired, and fatigue easily during exercise. This is because iron deficiency reduces the concentration of an enzyme needed by the cells to perform glycolysis. Because the ability of the cell to perform glycolysis is compromised, lactic acid accumulates in the blood and muscles. This increase in lactate causes an unfavorable environment in the muscle, resulting in reduced muscular endurance. **The recommended intake of iron for females is 15 – 18 mg.**

Sources of iron include:

- *Lean meats:* beef, liver, organ meats (high cholesterol), skinless turkey (dark meat), lamb, pork, veal, chicken (skinless, dark meat)
- *Shellfish/seafood:* shrimp, clams, mussels, oysters, sardines (high in sodium)
- *Beans and lentils (cooked/dry/fresh):* kidney, pinto, peas (black-eyed), green, garbanzo
- *Nuts, seeds:* pine nuts, cashews, almonds, walnuts, pecans, pistachios, brazil nuts, macadamia nuts, pumpkin seeds, sesame seeds, sunflower seeds
- *Others:* fortified breakfast cereals, enriched whole grain breads (“enriched” means thiamin, riboflavin, niacin, iron, and folic acid have been added), brewer’s yeast, nutritional yeast, wheat germ, leafy greens (spinach, kale), seaweed (dulse [1 c. = 100% of the USRDA for iron], hijiki, kelp), prune juice, dried fruit, blackstrap molasses, egg yolk.

Substances in coffee and tea can interfere with iron absorption. To enhance iron absorption, include sources of vitamin C at every meal. Sources of vitamin C include: broccoli, cauliflower, cabbage, brussel sprouts, potatoes, kohlrabi, green and red peppers, spinach, tomato, tomato sauce, oranges, orange juice, grapefruit, grapefruit juice, tangerines, kiwi, cantaloupe, honeydew melon, strawberries, papaya, cranberries, cranberry juice. Food (especially acidic food, such as tomato sauce) can also absorb iron from cast-iron cookware, and birth control pills also increase iron absorption.

Calcium

Calcium is essential for developing and maintaining healthy bones (consequently reducing the risk of fractures). Calcium also plays a role in muscle contraction (a deficiency is potentially related to muscle cramps), and nerve transmission. Calcium

also assists in blood clotting. **The recommended amount of calcium is 1,000 – 1,500 mg per day.**

Sources of calcium include:

- *Vegetables:* dark, leafy greens (collards, turnip greens, mustard greens) broccoli, bok choy, Chinese cabbage, rutabaga
- *Dairy:* yogurt, milk, natural cheeses (mozzarella, cheddar, swiss, parmesan), cottage cheese, ice cream, ice milk
- *Soy:* soy-based beverages with added calcium, calcium-set tofu/tofu made with calcium sulfate (read ingredients list)
- *Others:* breakfast cereal with added calcium; canned fish with soft bones (salmon, sardines [high in sodium]); pudding made with milk (look for low-fat/fat-free); soups made with milk (cream soups; look for low-fat/fat-free; if canned, might be high in sodium; look for low-sodium/reduced-sodium); fruit juices and fruit drinks fortified with calcium (orange juice, Juicy Juice)

Pre-Game/Practice

Preparation for games and practices occurs at least two days before a game/practice, not two hours before! **A week of poor eating cannot be made up for in two days.** The goals of the pre-game/practice meal/snack are to insure adequate hydration and optimal glycogen stores. Keep in mind, glycogen stores are low in the mornings, due to the overnight fast. In order to achieve these two goals, here are a few recommendations:

4 hours pre-game/practice: consume 2 g of carbohydrate per pound of body weight, from low and/or moderate glycemic index sources (see “The Glycemic Index...” in the “Carbohydrate” section above)

2 hours pre-practice/game: consume at least 1 pint (16 fl oz./0.5 L) of fluid (water, milk, juice, or sports drink; no caffeinated, carbonated soda, or caffeinated coffee, coffee drinks, or tea) and 0.5 g carbohydrate per pound of body weight (you can combine the carbohydrate and fluid requirements via a sports drink, provided the carbohydrate content meets your needs). It is also recommended that this meal/snack consist of low glycemic index foods (yogurt, bananas, oatmeal, bean soup, lentils, apples; see “The Glycemic Index...” in the “Carbohydrate” section above)

Post-Game/Practice

The goals of post-game/practice nutrition include glycogen, electrolyte, and fluid replenishment (especially when playing a two or three game weekend series). At the cessation of exercise, **you have a 15 minute window of opportunity during which is the best time to begin replenishing your carbohydrate stores.** During this time period, the enzymes responsible for making glycogen are most active. **This does not mean you have to gorge yourself with food after a game/practice!** This just means you should start working on replenishment within 15 minutes of finishing a game or practice.

After a game or practice, you want to **consume 0.5 g of carbohydrate per pound of bodyweight every two hours for 6-8 hours post-activity**. These carbohydrates should come from high glycemic index sources (see “The Glycemic Index...” in the “Carbohydrate” section above). You also want to consume some protein with this carbohydrate. **The amount of protein recommended for recovery is a 3:1 ratio of carbohydrate to protein**. The **recommendations for fluid replacement after activity are 24 oz. of fluid for every pound lost** (remember to weigh yourself before and after the game). This amount of fluid should be consumed within six hours post-activity. Also remember: **if you have not re-gained the amount of weight lost within 24 hours of the game/practice, you are dehydrated!**

Weight Gain

The following are some recommendations for gaining weight:

- Boost your total daily caloric intake by eating extra snacks, such as the following:
 - fruit yogurt
 - low-fat cheese and crackers, peanut butter and crackers
 - convenient snack foods, such as peanuts, sunflower seeds, almonds, granola, pretzels
 - English muffins (topped with low-fat cream cheese and jelly, peanut butter and jelly, tomato sauce and mozzarella for an English muffin pizza [adding mushrooms and green peppers increases the nutritional value])
 - bagels (with low-fat cream cheese and jelly)
 - bran muffins
 - pizza
 - milk shakes
 - instant breakfast drinks
 - hot cocoa
 - fruit smoothies
 - bananas
 - dried fruits (excellent source of carbohydrates and calories)
 - sandwiches (choose thickly sliced, hearty, dense breads, such as sprouted wheat, honey bran, rye, and pumpernickel; spread with a moderate amount of margarine or mayonnaise; stuff with tuna salad, chicken salad; peanut butter and jelly is a good choice, as is hummus with sprouts, sunflower seeds, cucumbers, tomatoes, mustard, olives, and feta; more than one sandwich is even better)
 - Eat larger-than-normal portions at mealtime
 - Eat higher calorie foods
 - Increase your carbohydrate intake, so your body uses carbohydrates for energy, not the protein from muscle and other lean tissues

The following are good, high calorie food choices:

- *Toast*: spread with peanut butter, margarine, jam, honey; choose thickly sliced, hearty, dense breads, such as sprouted wheat, honey bran, rye, and pumpernickel
- *Cold cereal*: dense cereals (as opposed to flaked and puffed type), such as granola, muesli, Grape-Nuts, and Wheat Chex; top with nuts, sunflower seeds, raisins, bananas, or other fruits
- *Hot cereal*: prepare with milk instead of water; mix in powdered milk, margarine, peanut butter, walnuts, sunflower seeds, wheat germ, dried fruit
- *Vegetables*: peas, corn, carrots, winter squash, beets; garnish with slivered almonds or other nuts or seeds, and grated or shredded cheese; sauté or stir-fry in olive or canola oil
- *Fruits*: bananas, pineapple, raisins, dates, dried apricots, other dried fruits
- *Juices*: apple, cranberry, cranapple, grape, pineapple, juice blends (peach-orange-banana); if preparing frozen juice, add less water than the directions indicate
- *Milk*: add powdered milk, malt powder, Ovaltine, Carnation Instant Breakfast, Nestle's Quik, or other flavorings; use milk in milk shakes, fruit smoothies; you can also add any of the previously mentioned ingredients to these drinks; drink 2% milk
- *Meats*: beef, pork, and lamb tend to have more calories than chicken or fish, but also tend to have more saturated fat (choose lean cuts when consuming); sauté chicken or fish in olive oil, canola oil, or margarine, and add bread crumb toppings
- *Beans, legumes, lentils*: calorie dense, and good sources of protein and carbohydrate; split pea soup, chili with beans, lima beans, other dried beans
- *Soups*: lentil, split pea, minestrone, barley soups; creamy soups are higher in calories, but also in fat; canned soups tend to be high in sodium, so opt for reduced-sodium varieties, if possible; soups with pasta and beans tend to be high in carbohydrates, making them good choices; if preparing canned soups, use milk in place of water, or evaporated milk in place of regular milk; powdered milk can also be added to canned soups; garnish soups with crackers, shredded cheese, croutons
- *Salads*: add cottage cheese, garbanzo beans (chick-peas), sunflower seeds, the vegetables mentioned above, chopped walnuts, raisins, tuna fish, lean meat, croutons, salad dressing (best prepared with olive or canola oil)
- *Potatoes*: powdered milk can be added to mashed potatoes; don't be tempted to drown baked or mashed potatoes in sour cream, butter, and gravies; these additions may contribute extra calories, but they also contribute saturated fats, which are bad for your heart; choose low-fat versions of these additions
- *Desserts*: oatmeal-raisin cookies, Fig Newtons, chocolate pudding, stewed fruit compotes, low-fat frozen yogurt, frozen fruit desserts, blueberry muffins, corn bread with honey, banana bread, other sweet breads and muffins

Weight Loss

There are many things you can do (lifestyle and nutritional choices) to aid you in achieving your weight loss goals. Small, frequent meals help to keep your blood sugar stable. Fluctuations in blood sugar levels can lead to hunger and cravings, and consequently overeating. Increasing the amount of fiber in your diet can also help you lose weight. Fiber makes you feel full, decreasing the likelihood of overeating. If you recall from the “Glycemic Index...” section, fiber also decreases the glycemic index of a food. The lower the glycemic index value for a food, the more stable the blood sugar will remain. Like stated before, a stable blood sugar will decrease cravings, hunger, and consequent overeating.

The recommended amount of fiber is 25 – 35 g per day.

Good sources of fiber include:

- Whole grains and starches (bulgur, barley, oat bran (hot cereal, muffins), oatmeal (bread, cookies, muffins), whole wheat bread)
- Cold cereals (All-Bran, All-Bran with Extra Fiber, Fruit & Fibre)
- Fresh fruits and vegetables, especially with the skin (brussel sprouts, corn, spinach, pears)
- Beans, legumes, lentils (kidney beans, slit peas, bean and barley soups)
- Unprocessed foods (look for psyllium, pectin, guar gums, corn bran, and rice bran in the ingredients) Other methods of safely decreasing daily caloric intake, while making sure you are still meeting the energy needs of your sport, include drinking plenty of water (see the “Water” section above for more information regarding daily fluid requirements), and reducing the amount of unhealthy fats in your diet (saturated fats, often found in processed foods, such as cookies, cakes, and pastries). **Do not be tempted to eliminate carbohydrates from your diet!** As stated above in the “Carbohydrate” section, carbohydrate provides the necessary metabolic fuel for optimal hockey performance. Cutting carbohydrates from your diet will not allow you to perform the extra physical activity you need to perform in order to burn calories and lose weight, as well as complete the training you need to engage in for Volleyball.

Low calorie food and beverage choices include:

- *Breads*: fluffy types of bread, thin slices, pitas or wraps, English muffins as opposed to bagels
- *Cereals*: flaked (Corn Flakes), puffed (Puffed Rice, Puffed Wheat, Kix, Rice Krispies) cold cereals
- *Vegetables*: green beans, broccoli, summer squash, tomatoes, cucumber, celery, lettuce, mushrooms, sprouts, bok choy; sauté or stirfry in broth (beef, chicken, mushroom, vegetable), as opposed to oils
- *Fruits*: watery fruits, such as grapefruit, plums, peaches, watermelon, grapes

- *Juices*: grapefruit, orange, tomato juice; if preparing frozen juice, use more water than the directions indicate; in the cafeteria, fill half of a glass with juice, and fill the rest of the glass with water
- *Milk*: skim milk as opposed to whole milk or 2%; as a bonus, the less fat there is in milk, the higher the protein content
- *Meats*: choose lean meats, such as chicken and fish, and sauté or stir-fry meats in broth (mushroom, vegetable, beef, chicken), as opposed to oils
- *Soups*: broth based soups; if preparing canned soup, use water in place of milk, or use half the recommended amount of milk, and complete the recommended volume of fluid with water; use more water than is recommended (1/4 c. to 1/2 c. more; as a bonus, this will also save you money, by getting more servings out of the can)
- *Salads*: begin meals with a salad consisting of the vegetables listed above; this will fill you up, causing you to eat less, help you to achieve the recommended “Five-a-Day” intake of vegetables and fruits, contribute to your fluid intake (these vegetables have a high water content), and help you meet the recommended intake of the antioxidant vitamins A, C, and E; skip the croutons, cheese, and bacon bits, and don’t drench your salad in dressing; instead, have the dressing served on the side
- *Sandwiches*: see “Breads” above; skip the mayonnaise and butter, margarine; instead, choose mustard, ketchup, horseradish, salsa, tomato sauce
- *Potatoes*: skip the sour cream and gravies; choose low-fat versions instead
- *Desserts*: choose fresh fruit; allow yourself one favorite dessert per week; this decreases the chance you will feel deprived and binge or overeat

Dining Out

With competitions and travel, dining out is unavoidable. When choosing restaurants, try to eat at establishments that allow special requests and substitutions. Buffets may be your best bet, because of the variety they offer; this allows you to design your own meal, and buffets often include choices from the recommended foods. A restaurant with a salad bar is also helpful, provided you follow the recommendations in this information and load on up vegetables and beans (kidney, chickpea) have the dressing on the side, and stay away from the high fat potato salads, macaroni salads, creamy dressings, bacon bits, cheese, and olives. Sit-down, family style restaurants may also be worth a look. Order pitchers of water, as opposed to soft drinks, or two pitchers of water for every pitcher of soda (no refills for the soda).

When dining at restaurants or choosing restaurants, look for the following items on the menu (or salad bar or buffet):

- *Baked potatoes*, with toppings (butter, margarine, sour cream) on the side; order an extra side of vegetables to pile on the potato; other good choices for toppings include salsa, tomato sauce; baked potatoes are sometimes located on the salad bar

- *Unbuttered breads and rolls, crackers* (ask for extra if you need to boost your carbohydrate intake)
- *Juices* (tomato, fruit), melon
- *Low-fat poultry and fish*, especially if it is baked, broiled, roasted, stirfried, steamed, poached, or grilled; avoid highfat prime rib, sausage, and duck, and fried foods; trim all visible fat, and request sauces and gravies on the side
- *Broth-based soups*, such as vegetable, chicken and rice, Chinese soups, minestrone, split pea, navy bean, lentil; avoid high-fat chowders and bisques; bonus: broth can contribute to fluid sources; sometimes soups are available at the salad bar, so inquire with your server if you do not see soups on the menu
- Steamed, roasted, baked, stir-fried or grilled plain, unbuttered vegetables, sauces (hollandaise, lemon-butter) served on the side
- Rice, couscous, lentils, beans

At Oriental restaurants, good choices include:

- *Rice* (white is ok, brown is even better; steamed or boiled, not fried), moo shu pancakes, lo mein noodles
- *Avoid* eggrolls, or other fried appetizers
- Dishes that are steamed or stir-fried; avoid fried dishes, labeled “crispy” or “batter-dipped”
- Sweet and sour sauce is ok; other sauces tend to be oily
- Egg drop soup, chicken chop suey, fortune cookies, wonton soup, steamed Peking ravioli, moo shu chicken, pineapple chunks
- Stir-fried chicken and vegetables with rice, beef with broccoli

Good choices from Mexican restaurants include:

- Beans and rice, tortillas (plain, not fried tortillas, such as those in soft tacos, burritos, fajitas, quesadillas, as opposed to tostados, chimichangas, hard shell tacos), bean soups, lime soup, chili (provided there is not a layer of grease floating on top), salsa (skip the guacamole and sour cream)
- Request that your meal be prepared light or easy on the cheese, in dishes such as those mentioned above
- Bean burrito (less cheese), chicken enchilada (less cheese)

At Italian restaurants/pizzerias, try to choose:

- Thick-crust pizza (load up on the vegetables and sauce, easy on the cheese, and high-fat meats [ham, pepperoni, ground beef, sausage]); pasta with tomato sauces, rather than high-fat cheese, oil, or cream sauces; cheese-filled tortellini, lasagna, and manicotti can also be high in fat; bean- or broth-based soups (minestrone, pasta fagioli)

Tips on choosing at delicatessens, diners, or fast-food restaurants:

- Pancakes, hot or cold cereal; bagels, English muffins, other low-fat muffins, spread with jelly or jam as opposed to butter; avoid egg, bacon, and/or sausage croissant or biscuit combinations
- Fruit, fruit juice, yogurt
- Chili (again, avoid the grease floating on top), bean soups (adding crackers increases the carbohydrate content of the meal)
- Roast or grilled chicken meals with mashed potatoes (gravy on the side, skip the butter), rice (plain), vegetables (corn on the cob), bread/rolls/biscuits/cornbread
- Leave the mayonnaise/sauces off grilled chicken sandwiches and *grilled* hamburgers
- If stuck with fried chicken, remove the skin; order extra rolls, biscuits with honey or jam, corn on the cob, vegetables
- Instead of a hamburger, choose lean roast beef, turkey, or ham sandwiches
- For sandwich bread, choose a sub roll rather than a wrap or, pita pocket
- For condiments, choose mustard, ketchup, tomatoes, lettuce, pickles, onions, not mayonnaise

If you need to pack your own food, here are some easy-to-find, portable suggestions:

- Bagels, crackers, pretzels, Fig Newtons, Pop-Tarts, trail mix or granola with dried fruit (go light on the nuts and candies (Reeses Pieces, M&Ms), chocolate chips)
- Single serving boxes of cereals (you can even get milk in a single serving juice box that does not require refrigeration)
- Dried apricots, raisins, fresh fruit (apples, oranges, bananas), single serving canned fruit, single serving juice boxes
- Puddings (not requiring refrigeration)

Sleep

To be adequately rested and prepared to perform at your best (athletically as well as academically), the recommended amount of sleep is **seven to nine hours per night**. Being adequately rested helps decrease your risk of injury, and causes you to not fatigue as easily. Adequate rest is especially important when your body is adjusting to changes in temperature or elevation.

RENEGADES

NUTRITIONAL MATH

Championship volleyball players need energy for:

Explosive Power Quickness Strength Precision Endurance

Then there is the challenge to attain peak performance while at the same time limiting excess weight to maximize jumping ability and quickness on the court. What you eat and drink, and when, can give you the edge. **Here are the basics:**

Calories:

1. Your body needs energy for its basic functions and activities of your daily like as a student.

To calculate this multiply your weight times 13.

Example: 160 #s x 13 = 2080 calories

2. To fuel your practice and competition.

Estimated energy expended per minute of vigorous volleyball:

Body weight in lbs 100 130 160 190 220

Calories burned 6.5 8.4 10.4 12.4 14.4

Example: (At 160#s) 10.4 calories x 45 minutes vigorous play = 468 calories

3. Add the results of #1 and #2 together for an estimate of your daily calorie needs.

Example: 2080 + 468 = 2548 (or 2500 to 2600 calories per day)

Specific “Fuels” (calories) needed: Your sport relies 90% on **anaerobic energy**, which is provided largely by **carbohydrate**. Below is the recommended allocation of calories to provide not only energy, but the raw materials for muscle repair, growth and maintenance, for a strong immune system, and for mental quickness:

Carbohydrate ~ 60% - 65% of total calories

Protein ~ 15% of total calories

Fat ~ 20% - 25% of total calories

Additional Key Nutrients that may be needed:

Take a multivitamin/mineral tab daily (Centrum or a “look-a-like” is good) as an insurance policy to meet all your needs.

Sodium, Potassium:

Usually replaced with a typical diet and use of sports drink for rehydration and recovery.

Calcium: A diet consistently low in Calcium can contribute to stress fractures and longer recovery times if injured. Sources: milk, yogurt, cheese, calcium fortified juices and cereals, soy products, and calcium supplements. Two easy-to-take supplements are Viactiv and One-A-Day chewables (500 mg each). There are also generic store brands of each of these types.

Iron:

Iron is essential for oxygen transport from lungs to working muscles. Low iron can lead to low energy and endurance.

Sources: lean red meats, dark meat of chicken or turkey, fortified breads and cereals, beans and peas (dried). Supplements do have side effects!

Timing:

1. Generally, eat and drink throughout the day, not just big quantities once or twice. This will help you reload energy (glycogen) stores more effectively for top performance and burn calories more efficiently for weight management.
2. Pre-workout snacks/meals. It is important to “top off” with a light meal or snack within 2 hours before your workouts or competition.
3. Post-workout snack/meal. Even more important, have a high carbohydrate snack within 15 to 30 minutes after your workout, followed by a meal of both carbs and protein within 2 hours of your workout. It is okay to just eat a meal within 30 minutes of your workout (carbs and protein).

Special note – post weight-lifting workout: post-workout snack should include both carbs and protein to help protein synthesis (ex: 300 calories, 20 – 30 grams protein).

Fluids:

For cooling your body, maintaining blood volume to deliver energy and nutrients to brain and muscles, and for maintaining good concentration and general energy levels. Hot, humid conditions increase the need for fluids beyond the guidelines below.

General Fluid Recommendations:

1. Stay well-hydrated throughout the day, everyday: urine should be clear and pale, and you should need to urinate at least 4-5 times per day.
2. Two hours before practice or match: At least 2 cups of water or sports drink
3. During warm-up: ¼ to ½ cup fluids as tolerated.
4. During practice or match: ½ - 1 cup water or sports drink every 15 minutes.
5. After practice or match: 2½ cups water/sports drink for every pound lost in sweat

Weight management:

1. “In season” is not a good time to try to reduce body fat. You can really decrease your energy for performance.
2. For weight loss, reduce calories ~300 /day (not below 1400 calories) and consider adding cardio.
3. For weight gain (lean mass), add calories ~500/day and work hard in the weight room.
4. Use of weight loss pills, teas, or laxatives can be hazardous to your health, sleep, and, hence, performance.
5. Be aware that poor sleep and stress can also impact weight management and performance.
6. Seek help if you have concerns in this area to learn what could work for you and keep your performance high at the same time.

All-Day Tournaments:

Keeping up with your nutrition during a day-long tournament is a challenge. Your play will suffer if you don't re-fuel between matches, and in the end, just a slight edge in energy and concentration could mean the championship. The following snacks are quick and easy-to-transport foods to have available when time is short between matches.

- Sports Drinks 100% Fruit Juices Fresh Fruit
- Energy bars or gels Yogurt Dried Fruit
- Granola Bars Pretzels Trail Mix (buy or make your own)
- Cereal Crackers Peanut butter and jelly sandwich

Preseason Training Needs:

This is an important time to enhance strength, build muscle, increase fuel (glycogen) storage capabilities, and improve fitness. Pre- and post workout fueling must be a priority during this crucial time. Consistently eating high-carbohydrate meals and snacks, especially before and after workouts, is essential to your success. Calorie levels should be adjusted for the increased playing time of 2- or 3-a-day practices.

RENEGADES

NUTRITION STRATEGIES

Your team is in the finals and it's the 5th and deciding game. Both teams are weary after a full day of hard-fought matches. With both sides evenly matched, the points are hard to come by. You're exhausted, and so is everybody else on both sides of the net. Which team will prevail?

At this point in a tournament, skill is not enough: It's about which players can dig deepest — and summon the extra strength, agility, and concentration to get over the top.

Whether you're setting, serving, hitting, blocking, or digging, you have the best chance of making that tournament deciding play when you're prepared nutritionally. If you're low on fluids and muscle fuel reserves, you might not get quite high enough for the block or you might not be fast enough to dig that shot. But if you've been replacing lost fluids and refueling as needed throughout the tournament, you'll still be playing your best — even in the last game of the day's last match. You'll get that block, anticipate and dig that spike, set the ball to exactly where it needs to be, or blast the ball through your opponents' fingertips.

When you've worked your hardest to train and to refine your skills, make sure that you're at your best on the court at all times by being prepared nutritionally. That means attention to hydrating and fueling prior to play, refueling and rehydrating during matches, and promoting a full and rapid recovery after play.

The Physical Challenge:

Volleyball is a sport characterized by short periods of all-out effort, combined with longer periods of less intense effort. The sport requires speed to reach the ball, explosive leg power for jumping, upper-body strength to spike the ball and block, precision for setting and shot-making, as well as concentration and tactical decision-making skills. An elite player may execute 250–300 high-power maneuvers in a 5-game match, mostly comprising jumping and split-second movements to get to the ball. The game is fast-paced, with most rallies lasting about 5–7 seconds.

Top players may train 30 or more hours a week. Training can include conditioning work, resistance exercise, and skill development. For elite players, indoor play can be year-round. Other athletes may play a combination of indoor and beach volleyball, and still others simply stick to the beach circuit. Practice matches and weekend tournaments are common.

All this effort on the court and during training exacts a physical toll:

Volleyball players can experience large losses of fluid and sodium due to sweating. Carbohydrate is the primary muscle fuel your muscles use when playing volleyball, and carbohydrate reserves get substantially depleted during matches — and especially during periods of heavy training. Tournament play places even greater demands on the body. Deficits from prior practices and matches can accumulate and result in poor play during games, and research has shown that volleyball players sometimes start their matches with low levels of carbohydrate muscle fuel.

Fortunately, there are easy-to-implement sports nutrition strategies that can help keep you fueled and hydrated so that you can play your best right up through the very last game of your match or tournament.

Three Key Principles of Sports Nutrition:

The 3 most important principles of sports nutrition for volleyball are to stay hydrated, to provide fuel for your muscles, and to promote optimal recovery after playing or training. Apply these principles correctly, and you can maximize the gains from your training and play your best at all times on the court.

Hydration:

As a volleyball player, fatigue is your enemy. It robs you of the ability to compete at your strongest. The single largest contributor to fatigue when training or competing is dehydration. When you're dehydrated, training is more difficult and movement on the court is harder. Dehydration also impairs your ability to concentrate and make tactical decisions.

When you combine multiple hours of intense play with the often stuffy conditions in a gym or heat and humidity outdoors, you get large fluid and sodium losses due to sweating. Complicating matters is the fact that you don't start to feel thirsty until well after you've lost a significant amount of fluid. This scenario can quickly lead to dehydration and a fall-off in performance. Fortunately, dehydration can be avoided by sticking to a disciplined hydration plan before, during, and after you train and play.

Fueling:

During training sessions, practices, and games, you rely on carbohydrate as a primary source of muscle fuel. Carbohydrate fuel is present in your body in two forms: Glucose circulates in your bloodstream, and bundles of glucose called glycogen are stored in your liver and muscles. The catch is that you don't have much of a reserve of these important fuel stores. Fully loaded, you may have about 40 calories' worth of glucose circulating in the bloodstream, and about 1,900 calories of glycogen. Heavy training sessions, long practices, and multiple-match tournaments can significantly deplete your glycogen stores. If you don't consume adequate carbohydrates after training and playing, your muscle glycogen reserves will gradually dwindle. When these stores run dry during a game, you turn to liver glycogen reserves to maintain your blood glucose level. But once liver glycogen stores are tapped, your blood sugar level drops, fatigue sets in, and your performance in the game begins to drop off dramatically. Or, if this occurs during training, you're forced to stop or cut back significantly. Thus, it's important to show up for training sessions, practices, and matches with your carbohydrate fuel reserves fully replenished. And to prevent muscle fatigue during tournament play, it's important to refuel with carbs between matches and games.

As a volleyball player, fatigue is your enemy!

Recovery:

Heavy training, long matches, and tournament play can combine to deplete your glycogen reserves. In addition, muscle tissue gets damaged as you train and play, and it requires repair. Your muscle tissue also is being stimulated to adapt to the demands of your training workload. Recovery is the process of reloading carbohydrate fuel stores, repairing and building new muscle tissue, and rehydrating. It's during the recovery process that you achieve the gains from each training session, practice, match, or tournament. And it is the process of recovery that enables you to be ready for your next training session or volleyball competition. Thus, recovery is an extremely important element of your volleyball training and game plan. Your body is ready to begin recovery as soon as you step off the court, but the process doesn't begin in earnest until you provide the nutritional components.

Start Fully Hydrated:

If you go into training sessions and practices fully hydrated, you'll be able to train harder and achieve better workouts. The same goes for matches and tournaments: You'll be able to sustain a higher level of play for longer, and that may be the difference between winning and losing a close contest.

Make up for any fluid deficits you may have incurred from prior practices or matches by consuming 14–20 fl oz (400–600 ml) of water or a sports drink 2–3 hours before you start play. Keep hydrating as needed prior to play and during warm-ups.

Monitor your hydration status prior to the start of play or training by checking the color of your urine. A light-yellow color is consistent with adequate hydration. If your urine is darker, more like the color of apple juice, that's a sign that more fluids are needed.

Start Fully Fueled:

Full muscle glycogen depletion typically doesn't occur from a single volleyball match or practice, but glycogen stores do get utilized every time you train or play. So if fuel reserves aren't consistently replenished, deficits build, and you start to feel fatigued during play or as you train.

To top off muscle glycogen fuel stores before training or playing, consume a pre-exercise meal somewhere between 2–4 hours before exercise. The goal is to start exercise fully fueled and hydrated, but also feeling comfortable. Choose familiar high-carbohydrate foods and beverages, and avoid slow-to-digest fatty and high-fiber foods prior to play. Carbohydrate-rich foods include pasta, rice, bread, cereal, vegetables, fruit, and dairy products such as flavored yogurts and flavored milks. Experiment during practices to find the right food items, and a routine that works best for you.

If you've got pre-game jitters, don't skip eating entirely. Instead, try liquid carbohydrate sources in place of solid foods. A fruit smoothie or a meal-replacement drink is a good alternative when nerves have your stomach tied up in knots.

Finally, don't forget to eat before morning workouts or training sessions. And if you don't feel like eating or you don't have much time, try a fruit smoothie or a meal-replacement beverage.

RENEGADES

MAKE A NUTRITION PLAN

IDEAS FOR HIGH-CARBOHYDRATE PRE-GAME MEALS

(2–4 hours before practice or a game)

Cold or hot cereal with fruit or fruit juice and low-fat or nonfat milk

French toast or pancakes with maple or fruit syrup

Toast with jam or honey and low-fat yogurt

Breakfast burrito (scrambled eggs, salsa, and cheese in a flour tortilla), and fruit nectar

Bagel or English muffin, with jelly and/or peanut butter, banana, and fruit juice

Pasta or cheese ravioli with low-fat, tomato-based sauce, French bread or low-fat breadsticks, steamed vegetables, low-fat or nonfat milk, a pudding snack, and canned fruit

Grilled chicken sandwich with frozen low-fat yogurt and baked potato with low-fat sour cream or salsa

Turkey sub sandwich with tomato, lettuce, mustard, baked chips, fruit juice, and low-fat frozen yogurt

Thick-crust cheese pizza, low-fat gelato, and canned peaches

Baked or grilled lean beef, chicken, turkey, or fish, steamed rice, dinner roll, cooked green beans, low-fat frozen yogurt, and fruit juice

IDEAS FOR QUICK-TO-DIGEST, HIGH-CARBOHYDRATE SNACKS

(at the venue or if you have pre-game jitters)

Fruit smoothie made with mango/banana/berries and low-fat or nonfat milk or yogurt

Fruit or vegetable juice

Small roll or sandwich made with a banana and honey

Low-fat or nonfat yogurt, or fat-free frozen yogurt, gelato, or sorbet

Get into the habit of carrying your own sports bottle to matches and practices. You may even want to bring 2 or 3 and put your name on them. This will allow you to have complete control over when you're hydrating, what you're hydrating with, and how much you're drinking. Keep a sports bottle on the bench during matches and close at hand during practices so that you can take sips at every opportunity.

Use Breaks Wisely – Continually Rehydrate:

A break in the action is your chance to rehydrate. Take the opportunity to rehydrate at each time-out, whenever you're on the bench, and during breaks between games and matches. Most players can easily consume about 5 fl oz (150 ml) during a quick stop in play. Each gulp from a sports bottle is about 1 fl oz (30 ml). The good news is that volleyball games typically have enough breaks that dehydration is completely preventable.

But to accomplish that goal, you've got to use those breaks wisely.

Match Your Sweat Rate:

Dehydration impairs your game when you lose upwards of 2% of your body weight due to fluid loss — that's just 3 lbs (1.4 kg) for a 150-lb (68-kg) athlete.

To stay hydrated while playing, it is now the consensus recommendation of authorities like the American College of Sports Medicine that athletes consume fluids at a rate that closely matches sweat rate. This generally requires something on the order of 13–26 fl oz (400–800 ml) of water or a sports drink every hour of exercise, preferably in smaller amounts taken frequently, such as 3-7 fl oz (100–200 ml) every 15 minutes. However, fluid needs can vary considerably, depending on factors such as your size, your position, and the conditions in which you are playing. Therefore, calculating your sweat rate is the best approach to determining your hydration needs, and it's really quite simple. In fact, you can do it during the course of practice and for the different conditions in which you play.

Monitor The Effectiveness of Your Hydration Plan:

Having a hydration plan is a good start, but monitoring your success is equally important. Many volleyball players fall far short of meeting their hydration needs. Monitor the effectiveness of your hydration plan by weighing yourself before and after practices or matches. Remember: The goal is to avoid dehydration, and that means losing no more than 2% of your body weight when you are playing. If your weight loss is greater than that, make a conscious effort to take in more fluids as you play.

Don't Forget About Recovery:

You've just finished a tough early-season training session or a full day of tournament play, and you are tired. All you want to do is sit down somewhere, elevate your legs, and rest. Or maybe you have a post-game meeting, or need to hurry back to the hotel bus. Don't let any of that get in the way of your recovery. If you are playing or practicing again soon, it will pay to get the jump on recovery, and your body is ready to start that process just as soon as you step foot off that court or finish your workout. But to get started on recovery, you need to provide your body with the nutrients it needs. That includes carbohydrates to restore depleted glycogen stores, protein to repair and build muscle tissue, and fluids and sodium to rehydrate.

Carbohydrates:

If you don't play or practice again within 24 hours, your usual high carbohydrate meals and beverages will generally promote a full recovery within about 24 hours. But if you're playing multiple matches over a weekend, rapid recovery is a must. This can be a problem in tournaments where you're in an unfamiliar venue and you don't have ready access to your usual sources of foods and fluids. For these situations, plan ahead: bring a cooler and make sure it's packed with a convenient recovery drink, and other foods and beverages that will provide the fluids, sodium, carbohydrates, and protein needed to get the recovery process started. To speed glycogen restoration after playing, consume about 0.5 grams of carbohydrates per lb (1.1 grams per kg) body weight within 30 minutes of finishing your match, and repeat this within 2 hours, or

consume a high-carbohydrate meal. For a 150-lb (68-kg) athlete, that equates to 75 grams of carbohydrates right after exercise, and then again 2 hours later. Continue consuming easy-to-digest, high-carbohydrate foods and beverages up until 20–40 minutes before your next game.

Protein:

Muscle tissue repair and building is another important facet of recovery. Muscle tissue is made up of protein, and protein is made up of building blocks known as amino acids. When you consume protein foods, the protein is digested and broken down into its component amino acids. These amino acids are then absorbed and repackaged into the proteins your body needs to repair and build muscle tissue. Consuming 10–20 grams of protein as soon as possible after training or playing will provide the amino acids needed for repairing muscle tissue damaged during play and for making new muscle tissue as an adaptation to your training. For resistance training workouts, consume 20–40 grams of protein (0.18 grams of protein per lb body weight [0.4 grams per kg]) soon before and/or after your workout to ensure that you have the necessary amino acid building blocks on hand to support the making of new muscle proteins. Below are three options for getting the protein you need to support your workouts:

- Consume 10–20 grams of protein just before and just after exercise; or
- Consume 20–40 grams of protein just after exercise; or
- Consume 5–10 grams of protein just after exercise and then again hourly for up to 3 hours after exercise or until regular meals resume.

Fluids & Sodium:

Even if you are diligent in your efforts to hydrate during practices and matches, you may lose more fluids than you take in. Weigh yourself before and after playing to gauge your net loss of fluids. Replace this fluid after play by gradually drinking 23 fl oz of a sports drink, recovery beverage, or water for every pound of weight lost (1500 ml for every kg of weight lost). Consume sodium sources along with your fluids. Rehydration will be more effective when sodium is included with the fluid and food you consume as you recover. If your loss of fluid during play consistently exceeds 2% of your body weight, try to increase your fluid intake during subsequent practices and matches to avoid dehydration.

As a practical strategy, have a cooler or bag with food and fluid options for speeding recovery after a tough practice or match. See an example list below listed below:

RECOVERY OPTIONS
Be prepared! Pack in your bag or cooler:
Bagel with low-fat cream cheese
Rice cakes and low-fat cheese slices
Whole-wheat pretzels
Fresh and canned fruits
String cheese and crackers
Low-fat yogurt or pudding

Tournament Sample Nutrition Plan

TIME	EVENT	WHAT TO EAT
6:30–7:00 a.m.	Breakfast Ideally 2–4 hours before a game	Low-fiber breakfast cereal with low-fat milk Banana Toast with honey PowerBar Endurance sports drink or water
7:00–8:30 a.m.		Frequent sips of PowerBar Endurance sports drink or water
9:00–10:30 a.m.	Game #1	Frequent sips of PowerBar Endurance sports drink, PowerBar Gels, or water during breaks in play
10:30–11:00 a.m.	Recovery	Plain bagel Yogurt Banana Frequent sips of PowerBar Recovery beverage or water
12:00–12:30 p.m.	Lunch	Turkey sandwich on French bread Canned fruit Baked chips Low-fat frozen yogurt Frequent sips of PowerBar Endurance sports drink or water
12:30–1:30 p.m.	Rest time	Frequent sips of PowerBar Endurance sports drink or water, PowerBar Energy Bites, PowerBar Gel Blasts energy chews, PowerBar Fruit Smoothie Energy bars, or Performance bars if hungry
2:00 p.m.	Warm-up	Frequent sips of PowerBar Endurance sports drink or water
3:00–4:30 p.m.	Game #2	Frequent sips of PowerBar Endurance sports drink, PowerBar Gels, or water during breaks in play
4:30–5:00 p.m.	Recovery	Choose from: PowerBar Recovery beverage PowerBar ProteinPlus Protein bar PowerBar Recovery bar String cheese and crackers Smoothie Bagel Peanut-butter-and-jelly sandwich
6:00 p.m.	Dinner	Cheese ravioli with meat or marinara sauce French bread Fresh or canned fruit Steamed vegetables Gelato or frozen yogurt Goal: Consume a carb-rich meal and then carb-based snacks until you retire for the night

This food plan is intended to give general guidelines for a typical tournament schedule. It is not designed to be any particular caloric level. For a personalized daily food plan speak to your family doctor.

RENEGADES

Pre & Post Match Dietary Prep

When you've worked your hardest to train and to refine your volleyball skills, make sure that you're at your best on the court at all times by being prepared nutritionally. That means attention to hydrating and fueling prior to play, refueling and rehydrating during matches, and promoting a full and rapid recovery after play. By making sports nutrition an integral part of your game strategy, you can stay ready for every workout and playing at your best throughout each game. Follow these tips for optimal performance on the court.

Before Practice/Match

Start Hydrated:

- Start hydrating 24 hours prior to your game/training session
- Check urine color: Lemonade color = well-hydrated; apple juice color = drink more
- 2–3 hours before exercise: Drink 14–20 fl oz of water or sports drink (400–600 ml)
- During active warm-up: Drink another 8 fl oz (240 ml) — about 8 swallows/gulps

What & When To Eat:

- Focus on carbs
- If you have more time before a game or practice (4 hours) eat more; if you have less time (2 hours), eat less to avoid stomach distress
- Eat a high-carb snack 30–60 minutes before a game or practice to top off fuel stores

2–4 HOURS BEFORE A GAME OR PRACTICE		
Recommended amount of carbs		
2 hours: 0.9 x weight (lb) = _____ grams (A) 2.0 x weight (kg) = _____ grams (A)	Meals should be high-carb, moderate protein, low-fat, and low-fiber	
OR		
4 hours: 1.8 x weight (lb) = _____ grams (B) 4.0 x weight (kg) = _____ grams (B)		
High-carbohydrate pre-game sample meals		
Cold or hot cereal with low-fat or nonfat milk and fruit or fruit juice		
French toast or pancakes with maple or fruit syrup		
Toast with jam or honey, and low-fat yogurt		
Breakfast burrito (scrambled eggs, salsa, and cheese in a flour tortilla) and fruit nectar		
Bagel or English muffin with jelly and/or peanut butter, banana, and fruit juice		
Pasta or cheese ravioli w/low-fat, tomato-based sauce, French bread or low-fat breadsticks, steamed veggies, low-fat/nonfat milk, pudding snack, and canned fruit		
Turkey sub sandwich with tomato, lettuce, mustard, baked chips, fruit juice, and low-fat frozen yogurt		
Thick-crust cheese pizza, low-fat gelato, and canned peaches		
Baked or grilled chicken, turkey, lean beef, or fish, steamed rice, dinner roll, cooked green beans, low-fat frozen yogurt, and fruit juice		

30–60 MINUTES BEFORE A GAME OR PRACTICE TO TOP OFF FUEL STORES	
Recommended amount of carbs	
Aim for about 40–60 grams of carbohydrates	0.3 g to 0.5 g x weight (lb) = _____ grams (C) 0.7 g to 1.1 g x weight (kg) = _____ grams (C)
Quick -to-digest, high-carbohydrate options	Carbs (g)
Fruit smoothie made with mango/banana/berries and low-fat or nonfat milk or yogurt (8 fl oz/240 ml)	30–35 g
1 serving fresh fruit or 100% fruit juice (1 cup)	25–30 g
Low-fat or nonfat yogurt (6-oz/180-ml container)	33 g
Fat-free frozen yogurt, gelato, or sorbet (1 cup)	45 g

During Practice/Match

Stay Hydrated & Fueled:

Hydrate AND FUEL at every BREAK IN THE ACTION

- Drink about 5 fl oz (150 ml) during a quick stop in play; 1 gulp equals about 1 oz
- Be sure to get 30–60 grams of carbs per hour (for exercise >1 hour) or 45–90 grams of carbs per hour (for exercise >2 hours) to help delay fatigue and improve performance

Stay in your hydration zone : Avoid losing more than 2% of your body weight

- Do this by drinking at least 13–26 fl oz (400–800 ml) water or sports drink each hour
- Try small amounts such as 3–7 ounces (100–200 ml) every 15 minutes
- Drink more if you sweat more
- Consume a sports drink with sodium, especially in hot or humid conditions

Three Key Principles of Sports Nutrition

The three most important principles of a sports nutrition game plan are to stay well-hydrated, to provide fuel for your muscles, and provide optimal recovery after training or competing. Apply these principles correctly and you can maximize the gains from your training and perform at your best!

After Practice/Match

Recovery Starts as Soon as You Step off the Court:

- To start your muscle recovery, consume foods/fluids with carbs and protein within 30 minutes after exercise
- Sports drinks, energy/protein/recovery bars, bites, gels, and chews make convenient and portable recovery foods
- Be prepared — pack recovery foods in your sports bag

Carbohydrates To Replenish Muscle Fuel Stores:

CONSUME CARBS TO KICKSTART MUSCLE RECOVERY (ESPECIALLY IMPORTANT IF YOU HAVE ANOTHER EVENT WITHIN 24 HOURS):	
Recommended amount of carbs	
Within 30 minutes	0.5 x weight (lb) = _____ grams (D) 1.1 x weight (kg) = _____ grams (D)
AND	
Within 2 hours	Repeat same as above OR have a high-carb meal (D)

RECOVERY OPTIONS
Rolls or Bagels
Peanut Butter & Jelly Sandwiches
Salted Pretzels
Fresh & Canned Fruits, Frozen Fruit Smoothies
String Cheese & Crackers
Low- Fat Chocolate Milk

Protein To Rebuild & Repair Muscle Tissue:

After Volleyball Games and Practices: Consume 10–20 grams of protein within 30 minutes
FOR RESISTANCE TRAINING: Protein intake just before and/or as soon as possible after resistance training is essential for optimal recovery, including the growth and maintenance of muscle tissue.

FOR RESISTANCE TRAINING: CONSUME ABOUT 20–40 GRAMS OF PROTEIN AS SOON AS POSSIBLE JUST BEFORE AND/OR AFTER EXERCISE*	
One time (in one sitting)	20–40 grams just after exercise (E)
OR	
In two sittings	10–20 grams just before and 10–20 grams just after exercise (F)
OR	
In hourly intervals for up to 3 hours after exercise or until regular meals resume	5–10 grams just after exercise, and then 5–10 grams every hour for 3 hours (G)

* Totals based on 0.18 grams per lb body weight (0.4 grams per kg)

Fluids & Sodium To Rehydrate:

- As soon as you step of the court, grab your bottle of water and/or sports drink.
- Average fluid loss due to sweating for volleyball players (summer) is 27 fl oz (800 ml) per hour.
- For every lb lost , gradually drink 23 fl oz per lb (1,500 ml per kg weight lost).
- Continue rehydrating until urine is pale yellow like lemonade, not darker like apple juice.

TOTAL DAILY CARBOHYDRATE RANGE	TOTAL DAILY PROTEIN RANGE
2.7 to 3.6 x weight (lb) = _____ grams (H)	0.55 to 0.8 x weight (lb) = _____ grams (I)
6 to 8 x weight (kg) = _____ grams (H)	1.2 to 1.7 x weight (kg) = _____ grams (I)

Daily Needs:

- Aim for a well -balanced diet with a variety of carbohydrates, lean protein, and healthy fats.
- As a volleyball player, carbohydrates should be the focus of your meals.
- Drink up early: Every morning when you wake up; have a large glass of water.
- Keep up your energy levels: Eat 5–6 meals per day.
- Consume more (at the higher end of the recommended range) on more intense training and game days.

PUTTING IT ALL TOGETHER (REFER TO LETTERS FROM PREVIOUS CHARTS)				
	CARBS	PROTEIN	FLUID	COMMENTS
BEFORE	2-4 hrs: _____ (A or B) AND < 1 hr: _____ (C)	Games/practices: Have a moderate-protein meal 2-4 hours before Resistance training: 10-20 grams (F)	Start hydrating 24 hours prior to game/training session Drink 14-20 fl oz of water or sports drink (400-600 ml) 2-3 hours before a game or practice	
DURING	30-60 grams of carbs per hour for exercise >1 hour OR 45-90 grams of carbs per hour for exercise >2 hours	Not required	Drink at least 13-26 fl oz (400-800 ml) per hour in small, frequent doses as play permits Drink about 5 fl oz (150 ml) during a quick stop in play Use sports drinks with 500-800 mg sodium per 32 ounces or 1 liter 1 gulp = ~1 ounce (30 ml)	
AFTER	Within 30 mins: _____ (D) AND Within 2 hrs: _____ (D)	Games/practices: 10-20 grams Resistance training: 20-40 grams (E, F, or G)	Gradually drink 23 fl oz per lb or 1,500 ml per kg weight lost Average sweat loss for volleyball players = 27 fl oz (800 ml) per hour	
DAILY	_____ grams/day (H)	_____ grams/day (I)	Hydrate continuously throughout the day	

RENEGADES

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