

Nutrition for Water Polo, Part 2

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Daily Nutritional Needs

The energy stores in the liver (i.e. liver glycogen) are the primary fuel the brain uses for energy. When the stores are low, focus and timing begin to suffer. Water polo players require a daily high-carbohydrate (CHO) diet to maintain stamina and replenish lost liver and muscle glycogen stores during practice, competition and/or weight training.

For athletes, the American and Canadian Dietetics Associations recommend 55 to 58 percent of calories be CHO, 12 to 15 percent protein and 25 to 30 percent fat (1). These are the same requirements for sedentary individuals. However, there has been a growing body of evidence that protein and fat requirements may need to be altered for active individuals, especially when 15 percent of the diet is protein (2,9,10). In order to avoid muscle loss, the protein and fat requirements have been slightly altered here for the recommended training diet as described below.

The Training Diet

During the season, a training diet should be comprised of 55 to 60 percent CHO, 20 to 25 percent protein and 15 to 20 percent fat (2). The goal of the training diet is to provide adequate energy for recovery and tissue repair quickly and efficiently, without adding body fat.

For some it is easier to keep track of grams than calories. For simplicity, if you ate 2,000 calories a day, 55 percent of that is 1,100 calories from CHO, which is equal to 275 grams of carbohydrates (there are four calories of CHO per gram; thus, $1100/4 = 275$ g of CHO per day. There are also four calories of protein per gram).

Protein

Some research suggests protein should be 1.4-1.7 g/kg bodyweight (bodyweight in kg = bodyweight in pounds / 2.2 kg) per day (9) or as high as 2g/kg bodyweight per day in athletes (10). The Recommended Daily Allowance of 0.8 g/kg bodyweight per day protein is based on what is healthy for the average sedentary individual, which is not necessarily enough for athletes.

The additional protein is crucial not only for muscle repair, but also as an additional energy source. During times of low CHO stores and exhaustion, the body will use its own muscle as an energy source. Because it is so difficult to build and maintain muscle, athletes should be careful not to lose it.

Fat

Keep fat intake to 15 to 20 percent of your total calories, consisting primarily of essential and monounsaturated fats. Essential fatty acids are the type of fat the body cannot create; it's found in fish, flax seeds and walnuts. Monounsaturated fats, which are fats with one double-bond, can come from olive or canola oils, seeds and/or avocados.

For someone consuming 2,000 calories a day, the fat intake should be about 400 calories. This is equal to about 44 to 67 grams (each fat gram contains nine calories).

Fat is used as fuel for endurance, but it also aids in neural recovery. Keeping your fat intake to less than 15 percent may have a harmful effect by inhibiting absorption of those vitamins that dissolve in fat, and it has no effect on improving your body fat percentage.

Because of the type of energy systems involved in water polo, fat is used the least. Keeping a low fat intake and maintaining your caloric intake to sustain your weight are key to adding minimal body fat.

Nutrition and Off-Season vs. In-Season vs. Pre-Season

Off Season

During the Off-Season, water polo players want to either add muscle mass or lose body fat. It is common for players to gain body fat during the off-season, then want to drop it quickly once pre-season begins. Some resort to crash or fad diets to drop body fat. This usually results in a loss of strength and muscle mass rather than body fat.

When trying to add muscle mass, pay as close attention to your caloric intake as if you were trying to lose body fat. This will help to keep unwanted fat gain to a minimum. Some fat gain is inevitable because you cannot add muscle without some sort of additional energy. This strategy should still result in a low level of fat gain.

The Bulking Up Training Diet

The diet should consist of 55 percent CHO, 25 percent protein and 20 percent fat. Eat another 500 calories per day to gain one pound per week. Eat additional protein. Adding additional protein can be easy.

- Try consuming 20 grams whey protein 30 to 40 grams carbohydrates 30 to 40 minutes prior to exercise.
- Sip carbohydrates during weight training (i.e. Cytomax).

- Immediately after, consume a protein shake with at least 20 grams whey-casein combo or drink 20 oz. of skim milk or fat free chocolate milk.
- Eat a whole food meal with the above ratios one hour later.
- Increase protein to 1.5-2g/kg bodyweight.
- “Zigzag” your calories

Pre-Season and In-Season

The Pre-Season and In-Season dietary regimens should follow the Training Diet as recommended in the “Daily Nutritional Needs” portion as described above. During these seasons, the goals have changed from adding muscle mass (hypertrophy) to strength and power development.

Pre-Game Meal

The primary purpose of the pre-game meal is to decrease the onset of fatigue (i.e. muscle glycogen depletion) during the game, which will lead to decreased performance. There is little consensus on the composition and timing of the pre-game meal.

Some trial and error may be needed. Try to use practice rounds to determine what food will not cause GI distress, will help maintain focus, endurance, etc.

Here are some guidelines for your pre-game meal:

Eat low-glycemic foods, such as whole grain cereals, certain fruits, chicken sandwiches made with whole wheat bread, etc., approximately two to three hours before a competition. This may be difficult with early morning tee times. Make sure to at least get something in 15 minutes prior to your tee time. The closer to your tee time, the smaller the meal. The food will help sustain blood-sugar levels.

- Keep protein and fat intakes low because they slow digestion.
- Avoid bulky foods, like raw fruits and vegetables, dry beans, peas and popcorn, which can stimulate bowel movements.
- Avoid gas-forming foods such as vegetables from the cabbage family and cooked dry beans.
- Drink 400 to 600 mL (14 to 22 oz) of fluid two to three hours before exercise, depending on your tolerance (1).
- Do not try new foods just before a match. Eat foods familiar with your digestive system.
- Some athletes prefer to use their favorite foods, which may give them a psychological edge.

Game Time

Although eating as directed above will allow you to top off glycogen stores (i.e. muscle CHO stores) coming into the event, you still have to contend with two potential enemies – dehydration and rapid glycogen utilization and depletion.

Dehydration

When games drag out longer than expected, one can lose a great deal of sweat and become dehydrated. During exercise 150 to 350 mL (six to 12 oz) of fluid should be consumed every 15 to 20 minutes depending on tolerance (1). A player's rate of fluid loss will depend on the environmental conditions, intensity of play, acclimatization, aerobic fitness, hydration status, age, and gender.

Glycogen Depletion

Glycogen depletion varies with the intensity of the match and aerobic fitness level. Although liquid carbohydrates can help restore lost glycogen, it is never replenished as fast as it is lost.

To remedy both problems, bring a water bottle containing a solution of six to seven percent carbohydrate and electrolytes, such as Cytomax, Heed, or Hammer Gel. Drink at time-outs and when taken out of the game. Try to avoid Gatorade, Powerade or any of the common sport drinks seen on commercials because they contain a considerable amount of table sugar, which may lead to GI distress and poor replacement of muscle glycogen.

But something is better than nothing. It is important to consume carbohydrates in order to prevent performance decrease. For games longer than an hour, a carbohydrate-electrolyte drink, rather than water, is recommended.

If in doubt, try testing a drink during a practice match. If you feel good, go with it during competition.

Post- Game Meal

DO NOT FORGET the post-game meal!

Consume 1.5 g/kg bodyweight of CHO-rich, low fiber foods and beverages within 30 minutes or as soon as possible after a game, and again every two hours for four to six hours to replace glycogen stores (1). This may be difficult when traveling, but failing to do so will encourage under-recovery and potential muscle wasting.

After physical activity lasting longer than an hour, the body best restores lost glycogen when carbohydrates and protein are consumed together in a ratio of 4:1 (6) or 3:1 (7,8), rather than simply consuming carbohydrates alone. Furthermore, the combination of CHO and protein has the added benefit of stimulating amino acid transport, protein

synthesis and muscle tissue repair, all of which will further speed recovery and re-energize you for your next competition.

Products such as Endurox R4 by Endurox and Recoverite by Hammer Gel will provide both nutrients. When in a bind another option is drinking 20 oz. of low-fat chocolate milk post-exercise.

It is better to consume the “meal” as a liquid in order to facilitate recovery faster, and follow with a variety of whole-foods between two and four hours later.

Return to the normal Training Diet at the next meal.

Tournament Nutrition

In terms of nutrition, tournament water polo is challenging. Apart from the considerations of being away from home - even for a weekend tournament – the tournament schedule is difficult to accommodate your nutritional strategies for recovery, and on a player's flexibility and ingenuity. Not only must you be committed to looking after fluid and carbohydrate needs between matches, but you must do so without a definite time-table of your day's activities. For a water polo player, one of the worst “injuries” to have to deal with is a cramp from eating too soon before a game.

As soon as a game schedule is known, plan a meal routine that schedules convenient pre-event meals and recovery strategies. When several games are played in succession over as many days, pro-active recovery techniques will be important to maintaining performance through the end of the schedule.

A lack of a nutritional plan can be a critical mistake. While on the road, take control of meals eaten on planes, buses and other travel options. As mentioned before, always carry some high-carbohydrate snacks or meal replacements such as “health bars,” ready-to-drink drinks/shakes, fruit and yogurt for emergencies.

Alcohol

The temptation of binge drinking may come more after a match for a celebration of victory, receiving a higher ranked belt or a gathering to ease the pain of defeat. A sensible amount will not hinder performance or health, however alcohol intake can interfere with post-exercise recovery. You need to know what “a sensible amount” is for your own tolerance. In general, this means one drink for women and two for men.

But alcohol intake can interfere with the game and post-exercise recovery (3-5).

Get a post-exercise meal and fluids in first before drinking any alcohol. This way, less alcohol will have a tendency to be absorbed into the bloodstream and pass into the small

intestine with the rest of the food.

Avoid any alcohol 24 hours post-exercise if you have any soft tissue injuries or bruises.

Alcohol and injuries are a bad combination, and it may actually increase swelling, bleeding and delay recovery (3-5).

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