

Sports Nutrition in Paddling Sports

Babak Shadgan MD., MSc. Sports Medicine, Orthopaedic Fellow, Dip. FA

**Director, Sports Medicine Centre, National Olympic Academy of I.R.Iran
Chief Medical Officer, Canoe, Kayak & Water Ski Federation of I.R.Iran
Medical Committee Member, International Canoe Federation**

E-mail: b.shadgan@qmul.ac.uk

In paddling sports like other sports, proper nutrition plays a critical role in athletic performance, but many active paddlers do not eat a diet that helps them do their best. A sports diet is not just for Olympic contenders. Athletes of all ages and levels will benefit from eating well. In reality, there is no pill, potion, or powder that can enhance your performance like the right foods and fluids.

The Energy Diet

To have enough energy you need to consume enough energy. Getting adequate calories is one of the keys to an ergogenic, or performance-enhancing, diet. With too few calories you will feel tired and weak, and you will be more prone to injuries.

The ergogenic diet is based on the US Department of Agriculture's widely published food guide pyramid, which includes five basic groups: grains, fruits, vegetables, dairy foods, and protein-rich foods. Sugars and fats provide extra calories after the needs for foods from the other groups have been met.

By eating adequate calories from a variety of foods, you will satisfy your need for macronutrients (carbohydrate, protein, fat) and micronutrients (vitamins, minerals).

Optimal nutrition includes a plant-based diet that is high in carbohydrate (60%-70% of total calories), low in fat (<30%of total calories) and adequate in protein (10%.15%of total calories).

Carbohydrates

Carbohydrate foods are what the body relies on most for fuel during exercise, and the amount stored in the body will directly affect the athlete's stamina and endurance.

A high-carbohydrate diet increases stores of glycogen, the energy for muscles, and improves overall athletic performance. The bulk of the day's calories--60% to 70%--

should come from carbohydrates such as bread, cereal, grains, pasta, vegetables, and fruit.

Different carbohydrate foods can affect your energy level in different ways. Digestion rates are expressed as a "glycemic index." Foods with a high glycemic index release energy into the bloodstream rapidly, while foods with a moderate or low glycemic index release their energy more slowly (table 1). (However, beware of the old idea that simple sugars are always digested rapidly and cause wide swings in blood sugar, and that all complex carbohydrates like bread are digested more slowly and don't cause blood sugar fluctuations. This turned out to be wrong, as the table shows.)

If you exercise for longer than an hour, you can begin to deplete your muscles of glycogen. By consuming 30 to 75 grams per hour of high-glycemic-index carbohydrate in liquid or solid form when you exercise, you can minimize this effect.

After a long workout or competition, your depleted muscle glycogen stores must be replenished, especially if you will be exercising again within the next 8 hours. Eat 1 gm/kg of high-glycemic-index carbohydrate just after exercise (in a 15-30 minutes), and consume a total of at least 2 gm/kg of high-glycemic-index carbohydrate in the first 4 hours afterward. Moderate-glycemic-index foods may be added for the next 18 to 20 hours, with a goal of consuming at least 8 gm/kg of carbohydrate during the 24 hours after an intense workout or competition.

Food	GI Index	Food	GI Index
Baguette bread	95	Apple	38
White rice	87	Low fat yoghurt	33
Corn flex	84	Skimmed milk	32
Biscuit	78	Dried Apricots	31
Chips	75	Red lentils	26
Fanta drink	68	Soya beans	18
Mars bar	68	Peanuts	14

Table 1 – GI index in some foods.

Fat

Fat is definitely an important energy source, providing up to 70% of the total energy in rest and about 50% during light and moderate exercise. It is primary energy source particularly for athletes involved in prolonged, low-intensity exercise. (For high-intensity, short-term exercise, carbohydrate is the primary fuel source.) About 20% of the calories in a performance-enhancing diet should come from fat, most of it unsaturated fat like vegetable and fish oils. Fat serves many other functions that are indirectly related to exercise performance. It is an essential component of cell

membranes, nerve fibres and vital organs are supported and cushioned by it. All steroid hormones in the body are produced from cholesterol and fat-soluble vitamin are stored in and transported through the body via fat and fat layer of skin also help preserves body heat.

Many athletes neglect their fat intake, fearing an increase in body fat. It is important to remind that an intake of 20% to 25% of calories from fat is not only acceptable but also preferred.

Protein

Proteins are the major structural component of the cell and are used for growth, repair and maintenance of body tissue, as well as maintaining the osmotic pressure in the plasma. Hemoglobin, enzymes and many hormones and antibodies for protecting the body from diseases are produced from proteins. Protein can also produced energy for the body but plays a minor role in energy production, contributing only 10% to 15% of the energy used during prolonged exercise. Although the current recommended dietary allowance for protein is about 1 gram per kilogram of body weight per day, most active people need slightly more. And athletes involved in heavy resistance exercise or prolonged endurance events may require 2 grams per kilogram per day. Even this amount is relatively easy to eat, since 100 grams of fish or chicken, 1 cups of tofu, or 1 cup of garbanzo beans contain 20 to 24 grams of protein.

Vitamins and minerals

Vitamins and minerals have an important role in energy metabolism. They don't contribute energy themselves, but vitamins and minerals are integral to food metabolism and energy production. Iron and calcium are the minerals most commonly deficient in athletes, and strict vegetarians may be deficient in vitamin B12. By consuming adequate calories and following the food guide pyramid plan, your needs for all the important micronutrients can be met. Vitamins A, D, E and K are fat-soluble and can accumulate to toxic levels in the body. Vitamins C and B-complexes are water-soluble. Water-soluble vitamins are generally non toxic. Vitamins regulate metabolism, facilitate energy release (several of the B-complex vitamins), and have a very important role in the process of bone and tissues synthesis.

Fluids

Drinking fluids throughout the workday and before, during, and after training and competition is essential for top athletic performance. Unfortunately, some paddlers tend to underestimate the importance of fluid replacements as an integral part of their sports diet. Because water is found in most body tissues (blood 80%, muscle 75%, bones 20%, and fat cells 0-10%), it plays a vital role in all body processes and functions during training and competition. Water carries energy to the working muscles and carries away waste products via the urine.

Water helps to maintain proper body temperature by regulating the removal of body

heat via "sweating". Water is found in all body tissues so it serves as a "shock absorber" and "lubricator" for organs and joints.

The normal daily water intake ranges from 2.5 litres in winter to 3.5 litres in summer. During exercise, the body loses fluid through the skin as perspiration and as water vapour in expired air. The amount of loss depends on the ambient air temperature, humidity and altitude with a range between 0.5 and 1.2 litres. Under extreme ambient conditions fluid loss can be up to 2 litres per hour or even more. When dehydration exceeds 2% of body weight a measurable deterioration of physical performance can be observed.

Water is the ultimate ergogenic aid, but because the body has a poor thirst mechanism, you must drink before you feel thirsty. Once you are thirsty you are already slightly dehydrated, and your performance will be diminished. The best way to tell if the body is well hydrated is by observing the amount and colour of an athlete's urine. Urination should be frequent throughout the day and it should be clear in colour. If the urine is dark and very yellow, more fluids are needed. Also measuring body weight before and after training is an effective method. For every 100 grams of weight loss (sweat), 150 CC of fluids should be replenished.

The day before a lengthy or intense training session or canoe competition a paddler should drink as much fluids as she or he can tolerate and eat plenty of nutrient-rich carbohydrate foods that have high water content (fruits & vegetables). For every gram of carbohydrate stored in the body, 3 to 4 grams of water are stored that are readily available for essential body processes.

To stay well hydrated, Two hours before a competition, a paddler should drink 500 CC of water, sports drink or diluted fruit juices. Since the body takes roughly 1 to 2 hours to process fluids, the athlete will have time to empty their bladder before exercising.

If tolerated 10 to 15 minutes before training or competition, the paddler should try hydrating the body with another 200 CC of water.

During training, the paddler should drink as much as he or she can comfortably tolerate. For exercise lasting an hour or less, 250 cc of cool water every 15 to 20 minutes provides optimal fluid replacement. During exercise that lasts longer than 60 minutes, carbohydrate-electrolyte beverages containing 5% to 8% carbohydrate should be drunk at the same rate to replace fluid and spare muscle glycogen. After exercise, replace every 100 grams lost during exercise with at least 150 cc fluid. After training or competition, the paddler should drink water and nutrient-rich beverages until he or she is no longer thirsty and then an additional 250 CC. It is important to note that caffeinated beverages (coffee, tea, and soft drinks) and alcohol should be used with caution because they act like diuretics which can cause dehydration. No alcohol should be consumed before or during an event.

A kayaker should consume a beverage that taste great, does not cause stomach cramps or diarrhea, and enhances absorption and performance. Fluid intake is all a matter of personal preference since what works for one kayaker may or may not work for another one.

Compare the following fluid replacements (table 2):

Item	Carbohydrate	Calories	Potassium	Sodium	Vitamin C
Apple Juice	29 gm	116	296 mg	6.6 mg	2.2 mg
Cola	26 gm	105	2.6 mg	8 mg	0
Grape Juice	32 gm	128	53 mg	5 mg	60 mg
Ice tea	22 gm	86	50 mg	13 mg	0
Lemonade	28 gm	106	40 mg	0	18 mg
Orange Juice	26 gm	112	472 mg	2 mg	96 mg

Table 2 – (all fluids are based on a 200 CC fluid serving)

Supplements

The sports world is filled with advertisements and stories about supplements, all claiming to improve speed, strength and endurance. The range is never ending and the promises are tempting. However there are no short-cuts to the top. Many of these supplements have either not been tested or have not lived up to their claims when tests have been conducted. It is also possible that the benefits seen by some athletes come from the power of positive thinking.

Creatine is the hottest supplement on the market, and unlike many of the products that hit the headlines each month, it has undergone the scrutiny of scientific research. Sports scientists have found that Creatine supplementation programs can increase muscle stores of this fuel source, and enhance recovery between high intensity workouts with short rest intervals. Although further researches is needed to determine benefits to the performance of paddling sports and to confirm the lack of long term side effects, Creatine may be a useful aid for some athletes in these sports.

Vitamins are substances needed by body cells to encourage specific chemical reactions that take place in the cell. Some vitamins are involved in energy reactions that enable cells to derive necessary energy from carbohydrate, protein and fats. As an athlete with a good appetite, you can get a lot of vitamins in your diet. By choosing wholesome foods, you can double or triple your vitamin intake. For example, if you drink 300 CC of orange juice, you'll get 200% of the recommended dietary allowance (RDA) of vitamin C.

If you eat fewer than 1,500 calories per day, one multivitamin and mineral pill might be good. If you do not eat meat, iron and zinc supplements can be helpful. Note that some fortified breakfast cereals and energy bars provide 100% of the RDA for many nutrients.

But you need to eat well even if you take a supplement. Without a doubt, fruits and vegetables are the best sources of important nutrients. The ones with the most vitamins are oranges and orange juice, cantaloupe, strawberries, kiwi, bananas,

green and red peppers, broccoli, spinach, tomatoes, carrots, and sweet potatoes. These powerhouse foods provide vitamins and may also guard against aging, cancer, heart disease, and other diseases.

Vegetarian Athletes

There are a large number of athletes, who have adopted vegetarianism and eat only food from plant sources. Some of them additionally consume dairy products and eggs.

Vegetarian athletes who consume dairy products and eggs are at a lower risk of poor nutritional intake because the diet is that much less restrictive.

For athletes who are strict vegans, it is necessary to select their foods very carefully to provide a good balance of the essential amino acids, a sufficient calories intake and adequate sources of some minerals and vitamins like zinc, iron, calcium, riboflavin, vitamin B12 and vitamin D.

Lack of knowledge in sports nutrition sometimes let these athletes to experience a decreased performance capacity and impaired fitness. Vegan athletes should be referred to a qualified sports physician or sports dietician for help in selecting necessary foods and diets that maximizes nutrient intakes.

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