

TAPER NUTRITION 2009 Edition:

It would be silly to not consider the role of nutrition on performance. First Rule of thumb * Taper is NOT about losing weight-DO NOT lose weight on taper. You want to eat plenty of food, but eat the right kind of food to give you the energy you will need.



14-7 Days to Race Day

Since you'll be tapering your training at this point, do the same with your diet. To avoid gaining weight and feeling sluggish, you need to bring your calorie intake down during the taper. At the same time, you want carbohydrate intake to be sufficient to keep your glycogen stores full for race day.

As always - but especially now - go for low-fat, high-carbohydrate foods such as whole grain cereal, bread, and pasta, along with vegetables and plenty of fruit. Consider taking a multivitamin and mineral supplement that supplies 100% of the RDA to ensure adequate intake, particularly if you tend to eat processed or packaged foods that may fall short on good nutrition. Start to eat breakfast at the time of the day at which you would on race day.

- As you reduce your yardage, realize that you will not be burning as many calories. Thus, you may gain one or two pounds if you don't cut back a bit on the quantity of your servings early in the week.
- Use care in selecting foods to eat during this time period, aiming for nutritious and healthy items rather than snack/high fat products.
- Hydrate well during taper (water is best) and in particular, during the carbohydrate loading period (three days prior to the meet). Research indicates that carbohydrates convert to glycogen more effectively when accompanied with the consumption of water. Make sure and drink **at least 8 glasses of water a day!** It is also very important to keep your body full of fluids while you work out. So drink a big glass before practice, during practice, and after practice. You do sweat while you swim! Sports drinks are also good at any time, but don't stop drinking water.
- **EAT MORE fruits and vegetables!** If you eat a good balanced diet, it should always include lots of fruits and vegetables. They are loaded with the power of vitamins and minerals that add extra energy the body need to perform to its best. Milk also has lots of vitamins and minerals the body uses to build strength so you can last through that 100 butterfly.
- Try to really scale back on fats during this time.

3 Days to Race Day

As mentioned above, **carbo loading** begins **three days** before the big meet. You'll want to begin increasing your carbohydrate intake to about 65% or more of total calories. This translates to almost 500 grams per day. As you boost carbohydrate intake, cut back slightly on fat and protein.

Choose foods for lunch and dinner that are high in carbohydrates (e.g., pasta, potatoes, rice, etc.). Continue monitoring and adjusting calorie and carbohydrate intake, making sure not to stuff yourself but also eating enough so that you do not feel hungry. It is especially important now to keep your meal times regular and not to miss meals. At home or away, take along non perishable, high-carbohydrate items such as sports bars and drinks, cereals, and dried fruit. These are great for augmenting your diet. For the longer races, continue intake at 500 to 600 grams a day.

*Ensure a high-carbohydrate eating plan.

*Include more rice and pasta: they have more carbohydrate than potato.

*Include nutritious carbohydrate-based between-meal snacks (see list below).

*As your training will be tapered pre-event, you won't need to eat more!

*Eating the right balance of increased carbohydrate and less fat is the key

2 Days to Race Day:

Since heavy sweat loss during longer races leads to dehydration, you will want to "fluid load" starting 2 days before your race. Drink plenty of liquids (**mostly water!**) throughout the day, making sure your urine color is clear or pale yellow, not dark amber. (This is a simple but effective measure of adequate hydration status.)

The Day Before:

This day, be sure to rest, eat (without overstuffing), and drink plenty of fluids. Provided you've been eating enough and sticking to high-carbohydrate and low protein and fat, your glycogen stores will be at their peak by the end of this day. Eat frequently and stay with familiar foods. And just to be safe, - especially if you are on the road - carry your own water supply and "go to the well" often to stay hydrated.

Give close consideration to the meal you eat the night before racing. It should include about 800 to 1000 calories, and - surprise, surprise - it should be high in carbohydrates and low in fat and protein. Avoid beans, broccoli, or other gas-causing foods, especially if they normally give you problems. Finally, the night before is not the time to experiment with new foods; the result of the experiment could be hindered performance the next day.

The Evening Prior to the big Meet

* Be sure to eat carbohydrate products that have been "tried and proven" during your training period. Keep pasta sauces simple, avoiding high fat varieties (e.g., alfredo, pesto, etc.). Avoid eating lots of salad items and vegetables (roughage) as these may prove to be troublesome on race day and can cause digestive problems.

* Stick to water during the evening meal. Because coffee and tea contains caffeine, these products may make it difficult for you to fall asleep easily. Keep in mind that caffeine products are diuretics, which contributes to dehydration.

Race Day Nutrition

For a Evening Competition (Section Prelims):

Breakfast: *Eat a good breakfast--This meal should top-up your blood sugar levels after the night's rest.

Lunch: Eat this meal about 2-3 hours before competition (approximately 2-3 hours before warm-up).

The meal does not have to be large, but should fill you up for the next few hours.

High-carbohydrate foods are the best options: e.g., bread, cereals, fruit, pasta, rice, etc.

Ensure that the meal is low fat, this speeds up digestion.

Keep drinking fluids-pee clear.

Avoid the caffeine in cola drinks, coffee, chocolate, and tea - it is dehydrating.

For a Morning/NOON Competition (Section Finals & State Prelims & Finals):

A good rule of thumb: Eat a light meal the morning of your race. Taking in carbohydrates, particularly before longer races, provides more energy for hard working muscles. If you are eating more than two hours before an event, a meal containing a moderate amount of protein may be eaten. For instance, cooked cereal, yogurt, a banana, and juice provide a high level of carbohydrate, a low level of fat, and a moderate amount of protein.

Your prerace meal should be eaten 2 to 4 hours before starting time and should consist of at least 200 grams of carbohydrates, which works out to 800 calories worth. To speed digestion, select foods or beverages that are low in fat and fiber. Bagels, raisins, bananas, sport drinks, pasta, and rice are great prerace foods.

Practice with your pre-event meal prior to your taper meet to fine tune this eating strategy.

AFTER THE WARM-UP - RECOVER FOR THE HEATS

After the warm-up, replace fluids immediately (leave your drink bottle at pool side).

Sports drinks are optimal as they replace fluids and carbohydrate simultaneously.

If there is less than 1 hour between races, just keep to fluid replacement.

If there is more than 1 hour between the warm-up and your first heat, try to eat a little.

See the "top-up between events" ideas later in this article.

The best approach is to eat a little and often during the day.

Seize the opportunity to eat a little "top-up" when you can.

Eating and drinking a little and often will help to keep you "firing" all day. Eating too much at once can make you feel heavy and lethargic. Little top-ups are best - they also prevent you getting really hungry.

DRINKING AND EATING BETWEEN EVENTS

Try to eat in longer breaks (longer than 1 hour between races).

In shorter breaks, use water or sports drink or water to replace fluids.

The indoor pool environment is humid and dehydrating.

Adequate fluids are **essential** all day to keep your blood and energy pumping.

If there is a longer break (a few hours) through the day, use it to eat a bit more.

Take your own high performance foods and drinks with you (don't rely on the water jug).

A cold pack and thermos helps to keep foods and drinks fresh and pleasant.

Record your food and fluid intake to keep count of when you last ate and drank.

To monitor hydration check that your urine output is regular and "looks clear."

Monitoring body-weight change over the day is another way to check hydration.

RECOVERY AFTER A HARD DAY'S COMPETITION

Have something to drink and eat immediately after your last swim.

Avoid the "fast food" chains on the way home - their high fat foods will delay recovery.

Have some high-carbo food prepared so you can eat as soon as you arrive home.

If possible take a thermos with a meal inside so you can eat even earlier.

Check your body weight to ensure you are rehydrated.

Drink Chocolate milk!

TOP-UP SNACKS BETWEEN EVENTS (breaks of 1-2 hours)

Snack fruits (small cans of fruit) or canned baby fruits.

Bananas.

Fruit that is peeled and cut up (easier to eat this way).

Plain bread rolls (white bread may be less heavy) - try pita bread!

Fruit buns (e.g., hot cross buns) or raisin bread.

Plain or fruit scones.

Home-made low-fat fruit muffins.

Rice cakes (you can top them with honey, jam, or banana).

Instant noodles (varieties that do not contain oil or the flavor sachet).

Jam or honey sandwiches.

Plain boiled pasta with a little tomato sauce.

Low-fat breakfast bar.

Plain crackers (not high-fat types).

Carbo gels (ask at sport stores).

Power bars (try gyms or sport stores).

[**Note:** Choose smaller amounts if you only have just over 1 hour. In longer breaks you can afford to eat a little more. Items in bold might be better for middle length breaks as they are smaller and perhaps easier to digest.]

BEST FLUID REPLACES OVER THE DAY: WATER or Sports drink

IN LONGER BREAKS: Sandwiches with low-fat fillings (avoid butter and too much salad).

Pasta or rice with tomato pasta sauce (a little chicken or very lean meat in sauce is okay).

REMEMBER - Practice with these strategies prior to the championships to fine-tune your eating for competition. Everyone is different and various combinations of the above tailored to your individual needs will work best.

Focus on high carbohydrate foods and drinks

Carbohydrate foods play a vital role as a training fuel. The critical source of energy for exercising muscles is your body's carbohydrate stores - a little from blood glucose, and a larger amount from glycogen stored in your muscles. These stores can only provide for up to a couple of hours of continuous exercise, and therefore must constantly be refilled from the carbohydrate in your diet. Running low on carbohydrate causes fatigue - you have probably experienced how bad it feels to run out of fuel. The more you train, the greater your daily carbohydrate needs are. Athletes who train every day can find it difficult to recover their muscle glycogen levels, day in day out, and may gradually deplete body carbohydrate stores. This is often the cause of tiredness and ineffective training.

FUEL YOUR ENGINE WITH CARBOHYDRATES

Nutritionists working with USA Swimming use the Glycemic Index to help recommend the best foods for a pre-race meal, during competition snacks, and post race meals. The Glycemic Index was developed to help diabetics control their blood sugar. The Index represents a carb's effect on blood sugar and reflects a food's ability to contribute glucose to the bloodstream. The lower the Glycemic Index number, the slower the glucose will enter the bloodstream. For pre-competition meals, the nutritionists recommend foods with a low GI. These would include power bars, apples, spaghetti noodles, fruit yogurt, underripe bananas.

During and after competition nutritionists recommend foods with a high GI - gatorade, baked potato, bagels, corn flakes, waffles, bread, graham crackers, honey, watermelon. High GI foods cause a sharp increase in blood sugar levels and then a steady decline, while low GI foods are absorbed slowly and there is not a steady decline. After consuming low GI foods, blood glucose levels will remain up for a longer period of time. (Some high glycemic index foods would be bananas, raisins, oranges, baked potatoes, and bagels. If you swim in the morning, a good breakfast choice would be corn flakes with sliced bananas and some sugar on it.)

While fat and protein percentages should remain consistent during training and competition, 2 or 3 days prior to the start of the meet it is recommended that an athlete focus on carbohydrates that have a high GI. This will replenish glycogen stores. But do NOT overeat! With your workload reduced in the water, it is important not to gain weight by overeating during the taper. Remember that protein is important to repair muscle tissue damaged during routine workouts and fat facilitates cellular reactions as well as serves as a fuel source during prolonged exercise. Also remember, a variety of foods from all food groups is best. Don't try new foods at the meet, however. Stick with routines and foods that you know will not upset your stomach.

It is also vital to hydrate before and during competition. The night before a meet, an athlete should drink two full water bottles. They should drink one full water bottle at breakfast the next morning. The environment at all the competition pools is very WARM. Extra water is a must for successful swimming.

Nutrition, hydration, timing of meals and snacks are all critical to preparing for the best performance.

Hydro Power

So aside from the depletion of the energy sources derived from the foods we eat, what else causes a reduced state in our muscles? Water is the ultimate ergogenic aid--but because the body has a poor thirst mechanism, you must drink **before** you feel thirsty. By the time you become really thirsty you may be two to three percent dehydrated! So be sure to drink some water or sport beverage every practice as well as four to six ounces every fifteen minutes during practices.

For one, we lose water during exercise, even during a swim practice! Try weighing yourself before and after practice - the weight loss is due to water that is lost due to sweating (yes, even in the water) and in addition for every gram of muscle glycogen that is burned, there are four grams of water that are eliminated in the process. Thus, it is important to replenish water during and after practices as even a two percent reduction of body stores of water can cause diminished athletic performance and compromise the recovery process.

To stay well hydrated, you need to drink about a quart of caffeine-free, nonalcoholic fluids for every 1,000 calories of food you eat, assuming you maintain your weight. To ensure that you are well hydrated before you exercise, drink 2 cups of water or sports drink 2 hours beforehand. To avoid dehydration during exercise, begin drinking early and at regular intervals. For exercise lasting an hour or less, 4 to 6 ounces of cool water every 15 to 20 minutes provides optimal fluid replacement

Food Group	Carbohydrates (Grams)	Calories
Milk (higher % of simple carbohydrates; less nutrient dense)		
Chocolate milk (1 cup)	26	208
Low fat (2%) milk	12	121
Pudding (any flavor) (1/2 cup)	30	161
Skim milk (1 cup)	12	86
Yogurt (fruit-flavored, low fat) (1 cup)	42	225
Yogurt (frozen, low fat) (1 cup)	34	220
Beans (higher % of complex carbohydrates; more nutrient dense)		
Black eye peas (1/2 cup)	22	134
Garbanzo beans (chick peas) (1 cup)	45	269
Navy beans (1 cup)	48	259
Pinto beans (1 cup)	44	235
Refried beans (1/2 cup)	26	142
White beans (1 cup)	45	249
Fruits (higher % of simple carbohydrates; less nutrient dense)		
Apple (1 medium)	21	81
Apple juice (1 cup)	28	111
Applesauce (1 cup)	60	232
Banana (1)	27	105
Cantaloupe (1 cup)	14	57
Dates (dried)(10)	61	228
Fruit Roll-Ups (1 roll)	12	50
Grapes (1 cup)	28	114
Grape Juice (1 cup)	23	96
Orange (1)	16	65
Orange Juice (1 cup)	26	112
Pear (1)	25	98
Pineapple (1 cup)	19	77
Prunes (dried)(10)	53	201
Raisins (1/2 cup)	79	302
Raspberries (1 cup)	14	61
Strawberries (1 cup)	11	45
Watermelon (1 cup)	12	50

Vegetables (higher % of complex carbohydrates; more nutrient dense)		
Carrot (1 medium)	8	31
Corn (1/2 cup)	21	89
Beans, Lima (1/2 cup cooked)	20	108
Peas, green (1/2 cup)	12	63
Potato (1 large, baked, plain)	50	220
Sweet Potato (1 large)	28	118
Three-bean salad (1/2 cup)	20	90
Grains (higher % of complex carbohydrates; more nutrient dense)		
Bagel (1)	31	165
Biscuit (1)	13	103
Breadsticks (2 sticks)	15	77
Bread (white)(1 slice)	12	61
Bread (whole wheat)(1 slice)	11	55
Cereal, ready to eat (1 cup)	24	110
Cookie (oatmeal raisin)(1)	9	62
Cornbread (1 square)	28	178
Cream of Rice (3/4 cup)	21	95
Cream of Wheat (3/4 cup)	20	96
English Muffin	25	130
Fig Bar (1)	10	50
Graham crackers (2 squares)	11	60
Granola bar (honey and oats) (1 ounce)	19	125
Hamburger bun (1)	21	119
Hot dog bun (1)	21	119
Noodles (spaghetti)(1 cup)	34	159
Oatmeal (1/2 cup)	12	66
Oatmeal, Quaker instant, flavored (1 packet)	25	110
Pancake (4 inch diameter)	10	41
Pizza (cheese)(1 slice)	39	290
Popcorn, plain (1 cup, popped)	6	26
Pretzels (1 ounce)	21	106
Rice, white (1 cup)	50	223
Rice, brown (1 cup)	50	232
Saltines (5 crackers)	10	60

Tortilla, flour (1)	15	85
Triscuits™ (3 crackers)	10	60
Waffles (2, 3.5" x 5.5")	17	130

Foods Rich in Carbohydrates Good Sources of Carbohydrates (CHO)

FOOD	AMOUNT	CHO(g)	% CALORIES FROM CHO
Pancakes with syrup	3(4 inch)	51	78
Baked Potatoe	1 large	51	93
Dried Fruit	1/2 cup	50	89
Pretzels	2 oz	43	77
Rice cakes	5	40	80
Power Bar	1 bar	40	73
Kidney beans	1 cup	35	75
Bagel	1	31	78
Fruit juice	1 cup	30	100
Bread	2 slices	30	75
Pasta	1 cup (cooked)	30	85
Banana	1	27	95
Sports Drink	16 oz	27	100

Source: BIOMED, March Edition 1997, pg 20.

*****Starch Forms*****

Beans: green, lima, red kidneys

bread and rolls

Cereal

Chick peas

Chili

Chop suey

Corn

Fruits

Leafy vegetables, lentils

Pasta, milk, pancakes, peas

Potatoes, sweet potatoes

Poultry, rhubarb, rice

QUICK TIP: CARBOHYDRATE

- Carbohydrate intake should be at least 55-60% of the daily caloric intake.
- Most foods in the starch/bread, fruit and vegetable groups contain a high percentage of carbohydrates, primarily complex carbohydrates.
- The Daily Reference Value (DRV) for carbohydrates is 300 grams. It is 25 grams for dietary fiber (based on a 2,000 caloric diet).
- 15 Gram Portions of Carbohydrates:
 1 fruit exchange: 1 apple, 1 orange, 1/2 banana, 4 oz fruit juice
 1 bread/starch exchange: 1 slice bread, 1/2 cup cereal, 1/4 large bagel, 1/3 cup beans, 1/2 cup cooked pasta, 1 small potatoe, 1/2 cup starchy vegetable
 3 vegetable exchange: 1.5 cups cooked vegetable or juice, 3 cups raw vegetables
 Sport drinks: 7-8 oz Exceed, Gatorade, Power Aid

Chocolate Milk: The New Sports Drink?

Feb. 24, 2006

(WebMD) During a 2004 Summer Olympics awash in controversies over steroids and supplements, one sportswriter wryly noticed that top American swimmer Michael Phelps was playing it safe -- he preferred to drink Carnation Instant Breakfast between races.

Now it appears that the six-time gold medalist may have been onto something. A new study shows that plain old chocolate milk may be as good -- or better -- than sports drinks like Gatorade at helping athletes recover from strenuous exercise.

The study, published in the *International Journal of Sport Nutrition and Exercise Metabolism*, was small in scale; it was partially funded by the dairy industry. But dietitians say the study should help to counter the notion that high-tech, expensive supplements are better than whole foods when it comes to athletic performance. They also note that milk contains key nutrients, such as calcium and vitamin D, in quantities that sports drinks can't match.

"[Milk] is a sports drink 'plus,'" Keith Ayoob, EdD, a registered dietitian and associate professor of pediatrics at the Albert Einstein College of Medicine, tells WebMD. "It will supply you with things you need whether or not you're working out."

The study builds on findings that intense endurance exercise reduces the muscles' supply of stored glucose, or glycogen, a key source of fuel for exercise. To maximize glycogen replacement, the American College of Sports Medicine and the American Dietetic Association recommend taking in a serving of carbohydrates within 30 minutes after a long and vigorous workout.

Milk vs. Sports Drinks

Common sports drinks such as Gatorade supply those carbs, as well as fluids and electrolytes lost through sweat. However, more recent research suggests that adding protein to the mix may further hasten recovery. Hence the new wave of drinks such as Endurox R4 that include protein as well as higher doses of carbs.

In the study, nine male cyclists rode until their muscles were depleted of energy, then rested four hours and biked again until exhaustion. During the rest period, the cyclists drank low-fat chocolate milk, Gatorade, or Endurox R4. During a second round of exercise, the cyclists who drank the chocolate milk were able to bike about 50% longer than those who drank Endurox, and about as long as those who drank the Gatorade.

The findings suggest that chocolate milk has an optimal ratio of carbohydrates to protein to help

refuel tired muscles, researcher Joel M. Stager, PhD, Indiana University kinesiology professor, tells WebMD.

But the most puzzling result of the study, experts say, was why Endurox -- which has the same carb-to-protein ratio as the chocolate milk -- fared so poorly. Researcher Jeanne D. Johnston, MA, tells WebMD it may have to do with the different composition of the sugars in the milk. Another theory is that the sugars in the milk may be better absorbed in the gut than those in the Endurox.

Edward F. Coyle, PhD, a researcher on exercise and hydration at the University of Texas, tells WebMD the trial would have been stronger if the researchers had also tested the effect of flavored water or another dummy (placebo) drink.

The study was partly funded by the Dairy and Nutrition Council, an industry group. Coyle says that the study's reliance on industry funding is not unusual in the world of sports research, as federal funding for such research is hard to come by.

A Cheaper Alternative?

While rapid nutrient replacement may not be important for casual exercisers, it can make a big difference in performance for competitive athletes who work out vigorously once or twice a day, says Roberta Anding, a sports dietitian and spokeswoman for the American Dietetic Association.

Anding has long recommended chocolate milk for young athletes who come to her practice at Texas Children's Hospital in Houston. For children and teenagers from lower-income families, it doesn't make sense to spend serious money on sports drinks when they can get milk as part of a subsidized lunch program, she tells WebMD. The only advantage of sports drinks, she notes, is that they never spoil.

Ayoob estimates that more than two-thirds of teenagers should be drinking more milk anyway because they don't get enough calcium in their diets. He also recommends milk for its vitamin D and potassium content. "For me, this is a no-brainer," he says.

Sources: Karp, J. *International Journal of Sport Nutrition and Exercise Metabolism*, 2006; (16: 78-91). "Nutrition and athletic performance -- Position of the American Dietetic Association, Dietitians of Canada, and the American College of Sports Medicine," <http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/adap1200.cfm>. Svrluga, Barry, "Olympics Swim Trials," *Washington Post*, July 13, 2004, <http://www.washingtonpost.com/wp-dyn/articles/A44785-2004Jul12.html>. Jeanne Johnston, department of kinesiology, Indiana University at Bloomington. Joel M. Stager, PhD, department of kinesiology, Indiana University at Bloomington; Keith Ayoob, EdD, RD, associate professor of pediatrics, Albert Einstein College of Medicine. Edward F. Coyle, PhD, professor, kinesiology and health education, University of Texas. Roberta Anding, clinical and sports dietitian, Texas Children's Hospital, Houston.