SportsNutrition
Nancy Clark MS, RD, CSSD
www.nancyclarkrd.com

The Athlete's Kitchen — Carbs, Proteins & Performance: Finding the Right Balance

Interested in how to best fuel for endurance exercise? Here are some tips presented at the 27th Annual SCAN* Symposium, April 2010 by Asker Jeukendrup PhD, Professor of Exercise Metabolism-Univ. Birmingham in England and Nancy Rodriquez RD PhD, Professor of Nutritional Sciences-Univ. Connecticut.. (*SCAN is the Sports Nutrition group of the American Dietetic Assoc.; SCANdpg.org).

Carbohydrate Update

Athletes commonly wonder what's *best* to eat during long runs, bike rides or other exercise that lasts more than 60 to 90 minutes. The answer depends on your personal tolerance. Some athletes enjoy the convenience of engineered sports foods such as Clif Chomps, PowerGels, and Sports Beans. Others prefer the taste (and price) of standard supermarket foods, such as Fig Newtons, dried pineapple, and gummy candy. All are equally effective. And because we're talking about "survival" more than "good nutrition" during endurance exercise, you need not *tsk tsk* yourself for enjoying candy. That's what your body wants—sugar! (FYI, gels and sports drinks are also "just sugar.")

Does it matter if you get your energy from a bar as opposed to a sports drink? No. Both solid foods and liquids (i.e., sports drinks) get burned at the same rate when you are exercising at a pace you can maintain for more than half an hour. Your job is to experiment during training to learn—
1) what settles best in your intestinal tract, and
2) what tastes best to you during extended exercise.

Consuming *enough* calories is more important than the *form* of the calories. With endurance athletes, research suggests the faster finishers consume more calories than the slower finishers. (Ironman Champ Chrissie Wellington consumed about 335 calories/hour when she won at Hawaii.) The challenge is to train the intestinal tract to manage that much fuel. If you are an endurance athlete, part of your training program is to practice your fueling so you can train your intestinal tract as well as your heart, lungs, muscles.

How much should you eat to maintain good energy when you're exercising for longer than 60 to 90 minutes? The standard recommendation for fueling during endurance exercise has been to target 1 gram carbohydrate/minute of exercise (60 g carb per hour, the equivalent of 240 calories). The research, originally done with just glucose, indicated consuming more than 60 g glucose/hour offered no benefits. The body has a limited number of glucose transporters and can carry only 60 g out of the intestines, into the blood and to the muscles.

Recent research indicates consuming as variety of sugars (that is, more than just glucose) allows more fuel to become available per hour. That's because different types of sugars (carbs) use different transporters. Generally, athletes consume more than just glucose. (Sports drinks, for example, tend to be glucose+fructose.) Let's say you eat a banana that consists of many different types of sugars and uses many different transporters. Your muscles will have access to more fuel (up to 90 g carb/hour; 360 calories) than if you consume just one kind of sugar. Variety is a wise idea!

- If you are exercising for less than 45 minutes, no need for fuel *during* exercise. (As always, enjoy a pre-exercise snack.)
- For 1-2 hours of exercise, target ~30 g carb/hour (120 cals).
- For 2 to 3 hours of exercise, target ~60 g carb/hr (240 cals).
- For more than 2.5 hours of exercise, target ~90 g mixed carbs (i.e., (360 calories of sports drink, candy, dried fruit, pretzels).

Some serious athletes train first thing in the morning without eating before/during exercise. While doing this may teach the body to burn more fat (hence spare limited glycogen stores), it's grueling and the verdict is unclear if this will enhance competitive performance. Stay tuned!

What happens if fueling before and during exercise creates intestinal distress? You might want to "swish and spit." When research subjects just swished and then spat out a sports drink, they improved their performance as compared to swishing and spitting just plain water. How could that be? Receptors in the mouth are linked to the brain. When the mouth gets a swish of sports drink, the brain gets the signal energy is on the way; it's OK to work harder.

Protein Update Protein requirements are hard to define because the amount of protein your body needs depends on how many calories you consume. That is, if you are restricting calories, you require more protein than when you eat adequate calories; the protein gets burned for fuel. (Note: If you are dieting to lose undesired body fat, you are unlikely to lose *only* body fat and build muscle simultaneously. Building muscle takes energy; dieting restricts energy.) Dieters should target at least 1 g protein/lb (2 g pro/kg).

The protein recommendations for non-dieters who consume adequate calories are:

Healthy adults:	0.4 g Pro/lb	0.8 gm Protein/kg
Strength athletes:	0.5 to 0.8 g Pro/lb	1.2 to 1.7 g Pro/kg
Endurance athletes:	0.5 to 0.6 g Pro/lb	1.2 to 1.4 g Pro/kg.

Because the typical athlete's diet contains more than enough protein, most athletes do not need protein supplements. A protein-rich food with each meal and snack can do the job.

During endurance exercise, should you choose a sports drink with protein? Not unless you prefer the taste; it does not offer performance advantages over a standard sports drink. The better time to consume protein is *after* exercise. That is, carbs+protein (as in chocolate milk, fruit yogurt, or spaghetti & meatballs) enhances muscle repair.

Consuming some carbs+protein before you workout, as a part of your pre-exercise meal (cereal+milk, fruit+yogurt) is another option to bolster the supply of protein that will be available both during and after exercise for recovery. (Note: Athletes generally don't burn much protein for fuel during exercise unless their glycogen (carb) stores are depleted.)

The bottom line: Meals/snacks with carbs as the foundation, protein on the side offer the right balance for performance.

Nancy Clark, MS, RD, CSSD (Certified Specialist in Sports Dietetics) counsels both casual and competitive athletes in her practice at Healthworks, the premier fitness center in Chestnut Hill MA (617-383-6100). For more info, read her *Sports Nutrition Guidebook* and *food guides for new runners, marathoners, soccer players,* or *cyclists.* See **www.nancyclarkrd.com** and **www.sportsnutritionworkshop.com.**

Resources:

Jeukendrup, A. *Sports Nutrition: From Lab to Kitchen*. Meyer 7 Meyer Sport, 2010

Mettler S, N Mitchell, K. Tipton. Increased protein intake reduces lean body mass loss during weight loss in athletes. *Med Sci Sports Exerc. 42(2):326-337, 2010.*

Rollo I. M. Cole, R. Miller and C. Williams. Influence of mouth rinsing a carbohydrate solution on 1-h running performance. *Med Sci Sports Exercise* 42(4):798-804, 2010.