

Protein and the Runner

by Trent Stellingwerff

The last article I wrote in Running Room Magazine examined a couple of diets that are getting much notice these days; namely the 'Zone' and 'Atkins' diets. Diets such as these, with extremely low dietary carbohydrate intake, have many negative side effects including decreases in endurance performance, decreased ability to recover after workouts and races, and many potential long-term health risks. On the flip side of the coin, certain types and amounts of protein are absolutely vital to the well being of a runner and also to a runner's performance. In fact, many experts now agree that runners who handle pretty high mileage should in fact take in slightly more protein than the average person. The key points to consider in acquiring the proper protein intake is how much you run and how large or small you are.

Protein Metabolism Simplified:

Amino acids are the building blocks, or precursors, of protein. There are 9 essential amino acids, which one must get from the diet, and there are 11 non-essential amino acids, that the body is able to synthesize without taking in the specifics from the diet. Most individuals that eat a well balanced diet don't need to worry about these specific amino acids, as they are in ample contents in red meat and among other protein rich foods (see figure 1). Of course, if you are a vegetarian, then these specific essential amino acids are harder to come by in the diet, and in these occasions, amino acids supplementation is sometimes warranted.

There are four ways for a person to have a daily loss of protein and amino acids¹:

1. Secretion into the gut
2. Amino acid nitrogen loss via urine or sweat
3. Carbon when you breathe out carbon dioxide (more during exercise!)
4. Incorporation into carbohydrate or fat for storage (there is no real 'reserve of protein')

One can easily see that if you're an athlete, who is sweating and breathing daily, at a much higher rate than someone who is sedentary, it is easier to end up excreting and losing more protein precursors, such as amino acids, through your daily breath and sweat losses. Human beings also have a small capacity to use certain amino acids to produce energy (~2-5% of total energy provision) during endurance exercise, and thus someone who is exercising, or running, at a higher level and volume also will have some increased protein needs². Some research shows that males also have an increased ability to burn, or oxidize, proteins compared to females, and therefore may need a slightly higher protein intake as well².

Suggested Types and Amounts of Proteins:

With the current average diet that most North American's consume, hitting the required level of daily protein intake is generally easily accomplished. Contrary to the vast amounts they suggest in the Atkins diet, a moderate amount of protein is needed by most individuals. Most experts agree that if you're a higher mileage runner (greater than 5-7 runs per week for ~60min per run) then a slightly higher level of protein intake may be warranted^{1&2}. Figure 1 outlines the amount of protein, in grams, of some common meat and non-meat sources. For reference, I've also included the saturated fat content on some items. One can appreciate how choosing the right type of protein can drastically cut down on your saturated fat intake. Something else to think about is that compared to skinless chicken breast, the same amount of lean beef has only 1 more gram of saturated fat but 6-times more zinc, 3-times more iron and 8-times more vitamin B¹².

Your daily protein intake also depends on your size and the amount you run. Non runners need about 0.8 g protein per kg body weight per day, while recreational runners (less than 4 to 5 runs per week for ~30 min per run) probably need a slightly higher protein intake of 0.9 g / kg body weight / day. Runners who log serious mileage (5 to 7 runs per week of ~ 60min or more per run) need at least 1.2 to 1.6 g / kg /day. To save you the headache of figuring out how much protein you need daily, I've constructed a table in both metric and imperial units in Figure 2. Just find your approximate weight on the left hand side column and then your approximate weekly mileage level across the top and you'll find the corresponding recommended total daily protein intake in ounces and grams.

Like I've already stated, it is very easy to get your daily protein requirements, as many individuals will easily sit down at a steakhouse restaurant and eat a 12 oz steak, which will give nearly 90 grams (3.2 ounces) of protein! Some high-risk groups for not achieving their daily protein intake are also groups that generally don't acquire enough daily calories; or are in a caloric deficit. These groups can include: dancers, elite female distance runners and wrestlers. Some individuals also swear by buying protein powder and shakes. There is some evidence that purified protein supplements may accelerate calcium loss, and therefore could lead to an increased risk for stress fractures. Natural protein sources contain phosphates, which negate calcium loss¹. Therefore, if you eat a well balanced diet, buying expensive protein powders and supplementing your diet is not necessary unless your total energy intake is not adequate or you're a vegetarian who can't meet your protein needs through non-meat sources (most vegetarians can and do).

The Final Word:

So although much evidence, in terms of endurance events and sports, are against the low-carbohydrate diets (see last issues article), runners should also not be afraid of getting good quality protein daily in their diets. The key is to have a well-balanced and mixed diet that includes protein lower in saturated fats. In fact, if you're someone who logs higher mileage, taking in a little extra daily protein is recommended. Also, if you're eating a mixed diet, then taking in extra protein via expensive supplements and protein powders is probably not necessary, and some evidence suggests that natural protein is better for you in the long run anyways.

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References

1. Lemon, Peter W.R. IOC Nutrition in Sport Chapter 10: Effects of Exercise on Protein Metabolism. Edited by Ronald J. Maughan. Blackwell Science, pp. 133-152, 2000.
2. Tarnopolsky, M. Chapter 4: Protein Metabolism in the Strength and Endurance Activities: Metabolic Basis of Performance in Exercise and Sport: Vol. 12. Editors: David R. Lamb and Robert Murray. Cooper Publishing Group, pp. 125-264. 1999.

Figure 1.

Foods to Ponder: Common Protein Contents in Certain Foods

Meat Sources

- BBQ Chicken (light) = 26g
- 1 slice of lean roast beef = 41g
- 1 slice of lean steak = 28g (only 2-3 grams of sat. fat)
- Full steak = 50-70g
- ½ pound of ground beef = 20g
- Most Fast food restaurant burger = ~26g but 17g of sat. fat
- Roast beef sub = 30g
- Most fish = 30-40 g (and most sat. fat under 3g)

Non-meat Sources

- 1 cup backed beans = 12g
- 1 cup garbanzo beans = 41g
- Fortified Breakfast Cereals = 3-5g
- Candy Bar = 6g (but 33g of carbs and 13g of fat)
- 1 cup of shredded cheddar = 28g of protein (but 24g sat. fat)
- 1 cup of low fat cottage cheese = 30g of protein (but only 7g of sat. fat)
- 1 cup of tofu = 40g of protein
- 1 cup cooked lentils = 18g

Figure 2.

Daily Protein Requirements

Each number gives the ounces or grams of protein needed daily

Body Weight	Amount of Running		
	Non-Runner	Lower Mileage	Higher Mileage
125 pounds 56.8 kg	1.6 ounces/daily 45g/daily	1.8 ounces 51g	2.9 ounces 82g
150 pounds 68.2 kg	1.9 ounces 55g	2.2 ounces 61g	3.5 ounces 99g
175 pounds 79.5 kg	2.3 ounces 64g	2.5 ounces 72g	4.1 ounces 115g
200 pounds 90.9 kg	2.6 ounces 73g	2.9 ounces 82g	4.7 ounces 132g
225 pounds 102.3 kg	2.9 ounces 82g	3.2 ounces 92g	5.2 ounces 148g
250 pounds 113.6 kg	3.2 ounces 91g	3.6 ounces 102g	5.8 ounces 165g
275 pounds 125 kg	3.5 ounces 100g	4.0 ounces 113g	6.4 ounces 181g

Lower Mileage = approximately less than 4 to 5 runs per week for less than 30 min per run

Higher Mileage = approximately 5 to 7 runs per week for more than 60 min per run