

### Lesson 3 - Carb, Protein, Fat...How Much is Enough?

We talk a lot about the body using carbohydrate, protein and fat as it Energy-Yielding Nutrients, but the requirement from swimmer to swimmer varies. A swimmer's energy requirements depend on several variables, including their age, gender, body weight (and possible composition) and level of training.

According to the American College of Sports Medicine, American Dietetic Association and Dietitians of Canada Joint Position Statement on Nutrition and Athletic Performance,

***“Protein requirements are slightly increased in highly active people. Protein recommendations for endurance athletes are 1.2-1.4 g/kg body weight per day, whereas those for resistance and strength-trained athletes may be as high as 1.6-1.7 g/kg body weight per day. These recommended protein intakes can generally be met through diet alone, without the use of protein or amino acid supplements, if energy intake is adequate to maintain body weight.” (ACSM, ADA, Dietitians of Canada, 2000, p 2131)***

The generally recommended daily intake of protein for swimmers in training is 1.4-1.8 g/kg of body weight. Typically this should account for 12-15% of total calories. For a 160 lb athlete, that equates to 102-131 g/day, which is 12-15% of a diet of 2,720-4,367 kcal/day.

Meeting this requirement typically ensures adequate dietary intake of all of the necessary amino acids. It is important, however, that high-quality protein products be selected. Sources include meats, dairy, beans, dried peas, milk, eggs, and grains. These sources provide a more complete mixture of the necessary amino acids and therefore have a higher “biological value” or protein efficiency score. If these protein needs can be met by selecting good dietary sources of protein on a daily basis, the amounts of amino acids required to achieve the effects observed in the studies mentioned above can easily be met as well. There is no evidence that ingesting protein in amounts far in excess of the recommended intake is beneficial to either protein balance or exercise performance. The primary role of protein, and therefore amino acids, is to synthesize structural proteins and TCA-cycle intermediates. Excess protein can be stored to some degree, but that which is not used for the aforementioned purpose is typically metabolized and excreted. Protein is generally not used for energy during exercise.

The American College of Sports Medicine, American Dietetic Association and Dietitians of Canada Joint Position Statement on Nutrition and Athletic Performance also states that:

***“Carbohydrates are important to maintain blood-glucose levels during exercise and to replace muscle glycogen. Recommendations for athletes range from 6 to 10 g/kg body weight per day. The amount required depends upon the athlete's total daily energy expenditure, type of sport performed, sex of the athlete, and environmental conditions.” (ACSM, ADA, Dietitians of Canada, 2000, p 2131)***

The general recommendation is that carbohydrate intake should account for at least 60% of total caloric intake. In addition, long-supported research by Costill (1988) indicates that athletes training more than 2 hrs/day require a carbohydrate intake of 9-10 g/kg of body weight on a daily basis to prevent chronic depletion of carbohydrate stores.

Body Weight in lbs (kg)	Carbohydrate Required (g) to meet Intake of 9 g/kg	Carbohydrate Required (g) to meet Intake of 10 g/kg	Protein Required (g) to meet Intake of 1.4 g/kg	Protein Required (g) to meet Intake of 1.8 g/kg
120 (54.5)	491	545	76	98
130 (59.1)	532	590	83	106
140 (63.6)	572	636	89	115
150 (68.2)	614	682	95	123
160 (72.7)	655	727	102	131
170 (77.3)	695	773	108	139
180 (81.8)	736	818	115	147
190 (86.4)	777	864	121	155
200 (90.9)	818	909	127	164
210 (95.5)	859	955	134	172
220 (100.0)	900	1,000	140	180

Lastly, The American College of Sports Medicine, American Dietetic Association and Dietitians of Canada Joint Position Statement on Nutrition and Athletic Performance also states that:

***“Fat intake should not be restricted, because there is no performance benefit in consuming a diet with less than 15% of energy from fat, compared with 20% to 25% of energy from fat. Fat is important in the diets of athletes as it provides energy, fat-soluble vitamins, and essential fatty acids. Additionally, there is no scientific basis on which to recommend high-fat diets to athletes.” (ACSM, ADA, Dietitians of Canada, 2000, p 2131)***

The general recommendation is that swimmers get 20-25% of their calories from fat. For the swimmer whose daily caloric requirement is 2,000 kcal, this translates to 400-500 kcal from fat, or 44-56 grams of fat per day. Use the following table to determine that amount of fat you should be consuming on a daily basis:

Total Caloric Need (kcal)	Daily Fat Intake (g) To meet 20-25% of this Caloric Intake
2,000	44-56
2,500	56-69
3,000	67-83
3,500	78-97
4,000	89-111
4,500	100-125
5,000	111-139
5,500	122-153
6,000	133-167
6,500	144-181
7,000	156-194