

Nutritional strategies to gain muscle mass

Protein is an essential macronutrient for humans because they play a variety of important physiological functions: form the structural basis of muscle tissue, is the principal component of most muscle enzymes, are the basis of the immune system and they have a prominent role in physical performance. In general, proteins are not considered as an important energy source during physical activity, since carbohydrates and fats mainly perform this function. However, we must consider that immediate energy reserves usually consist of deposits muscle and liver glycogen, which are around 400-500 g (whose energy intake is approximately 1600- 2000 Kcal), and the intramuscular fat; therefore in endurance long-distance sports, proteins can be an important energy resource.

Protein needs in athletes

There is no doubt that the proper quantity of protein and essential aminoacids in the diet is of great importance to the sports group in different physiological states, and in the same way, a protein deficit causes a decrease in the ability to generate maximum muscular power. Some studies declare that an additional amount of protein content in the diet as a form of aminoacid supplements or protein isolates are needed for optimal performance.

However, the minimum recommended quantity of protein needs for athletes varies according to the nature of the effort. These recommendations are shown in Table 1. The minimum range to ensure adequate intake if workouts with large volumes.

COLLECTIVE GROUP	QUANTITY OF PROTEIN NEEDED TO HAVE POSITIVE BALANCE (grams x kg body weight)	
<i>Sedentary</i>	0,8	Etzel (2004); Kerksick (2008).
<i>Physically active</i>	1,0 – 1,4	Kreider y Campbell (2009); Lemon, (1996 y 2000); Paul, (1989); Reeds y Hutchens (1994).
<i>Strength training, maintenance</i>	1,2 – 1,4	Grandjean (1993); Hicson (1994); Kerksick (2008); Wilians, (1993).
<i>Strength training</i>	1,6 – 1,8	Lemon (1992); Hickson y Wolinsky (1994); Reeds y Hutchens (1994); Tipton, (2007).
<i>Gain muscle mass</i>	1,7 – 1,8 + positive intake (400/500 kcal/day to gain 0,5 kg of muscle/ week)	Bartels (1992); Burd (2009); Forbes (1994); Koopman (2009); Symons (2007).
<i>Resistance training</i>	1,2 – 1,4	Andersen (2005); Biolo (1995); Clesley (1992); Hoffman (2009); Hulmi (2009); Lemon (1996); Willoughby (2007).
<i>Weightloss</i>	1,4 – 1,8	Hernandez (1996); Nemet (2005); Mettler (2010); McCleave (2010).

Table 1. Recommended intakes of protein (g/ kg body weight) for different groups of people. (Urdampilleta, Martínez-Sanz y Vicente-Salar, 2010)

From a dietary point of view and nutrition is important to know what are the objectives of the training (if work is aerobic endurance or strength) to make an accurate advice based on protein needs. Another variable to consider is the degree of tissue damage in the practice of a particular sport.

Dietary-nutritional strategies for increased muscle mass

Bartels et al. (1992) note that an additional increase of 500 kcal / day can help increase weight 0.5 kg per week for strength training program. Even in some cases up 15% of the energy daily required is recommended to promote increased muscle mass. Hence, it is necessary to personalize the intakes, since athletes with great muscular development (more than 50-52 kg of muscle mass) and especially if strength endurance training, need extra protein intake. So, a diet with a positive energy balance, mainly in the form of carbohydrates (60-70%), improve protein balance and consequently would not be necessary to exceed the recommended quantity of protein identified in the preceding paragraphs.

The optimal time for protein anabolism starts after training during the first 2 hours, and until the following 6 hours as glucose protein turnover more easily into the muscle cell by a process independent of insulin and it is increased. In these first two hours carbohydrates intake allows resynthesis of muscle glycogen because insulin levels rise more effectively giving anabolic processes and improving hormonal status after exercise. Moreover, several studies indicate a carbohydrate and protein intake before and during training, to reduce protein catabolism and later without a protein supplement in recovery phases.

References

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2. POSITION OF THE AMERICAN DIETETIC ASSOCIATION, DIETITIANS OF CANADA, AND THE AMERICAN COLLEGE OF SPORTS MEDICINE: Nutrition and Athletic Performance. J Am Diet Assoc. 2009; (109):509-527.