

# Are Humans Able to Manufacture All of the Amino Acids Necessary to Make Proteins?

Healthy Eating | Nutrition | Amino Acids  
By Jessica Brusco Updated December 27, 2018



Although your body can manufacture many of the 20 amino acids necessary to make proteins, it can't make them all. Those your body can't produce, called the essential amino acids, must come from the foods you eat. Most Americans consume more protein than they need, so they usually also get the required amino acids, unless they follow a very restrictive diet.



## Non-essential Amino Acids

Your body can make some of the amino acids necessary for creating new cells either from the remains of old protein cells or from the essential amino acids. These include glutamic acid, alanine, aspartic acid and asparagine. You don't need to get these amino acids from your diet, although some of the foods you consume may contain them.

## Essential Amino Acids

Nine amino acids need to come from the foods you eat, since your body can't make them. These include phenylalanine, methionine, lysine, leucine, isoleucine, threonine, histidine, valine and tryptophan. Animal products, including meat, poultry, seafood and dairy products, contain all of these essential amino acids, while most plant foods, with the exception of quinoa and soybeans, are lacking in one or more of these essential amino acids. However, eating a variety of different plant foods throughout the day will give you sufficient amounts of all the amino acids.

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## Conditional Amino Acids

A few of the amino acids are conditionally essential. Normally your body can make them, but if you are sick or under a lot of stress you might need to get at least some of your requirements for these amino acids through your diet. These include cysteine, arginine, tyrosine, glutamine, serine, ornithine, proline and glycine.

## Recommended Protein Consumption

Approximately 10 to 35 percent of your daily calories should come from protein to ensure you get plenty of the essential amino acids, recommends the Centers for Disease Control and Prevention. Choose mainly lean protein sources to avoid consuming too much fat. Although there isn't a maximum recommended amount of protein, getting more than 45 percent of your calories from protein could cause a condition known as "rabbit starvation" that can lead to death, with symptoms including nausea and diarrhea, according to the World Health Organization.

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## References

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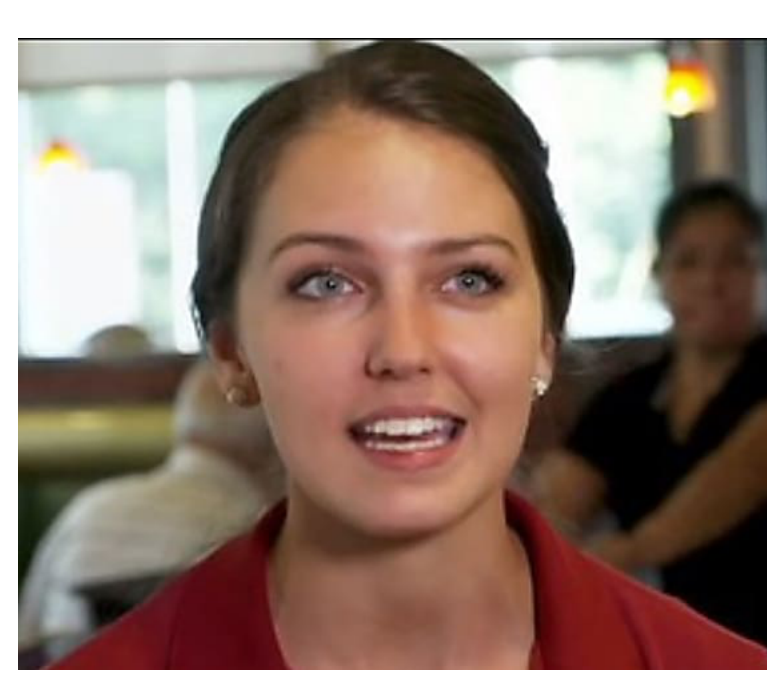
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# Facts on Protein for Young Athletes

By Jessica Brusco



Large increases in protein intake among athletes of any age is unnecessary, according to the National Institutes of Health's MedlinePlus. While young athletes have slightly higher protein needs than young people who are sedentary, these are easily met while following a normal diet. Protein provides amino acids the body uses for building new tissue and serves as a source of energy for the body, but consuming too much protein isn't healthy.

## Protein Requirements

Your protein requirements increase if you consume fewer calories or fewer carbohydrates, if you consume mainly lower-quality vegetarian sources of protein or if you train harder. Elite athletes need less protein than beginning athletes, as their bodies adapt over time to training, so young athletes may need slightly more protein than older athletes who are more experienced. While both strength athletes and endurance athletes need extra protein to meet their energy needs, strength athletes also need the amino acids from protein to build extra muscle so their protein requirements are a bit higher. The RDA for protein is .4 grams per pound of body weight, but elite weightlifters may need up to 1.3 grams per pound of body weight, especially if they are trying to lose weight while maintaining their muscle mass. Endurance athletes should consume between .5 and .7 grams of protein per pound of body weight, and strength athletes need between .6 and .9 grams of protein per pound of body weight.

## Best Sources

Animal-based protein sources contain all of the essential amino acids, making them high-quality proteins. Lean meat, poultry, fish, eggs and dairy products contain high amounts of protein. Whole grains, beans and nuts also provide significant amounts of protein, but do not contain all of the essential amino acids. However, eating two different types of vegetarian protein or eating both animal protein and vegetarian protein sources within the same day will provide you with enough of all of the essential amino acids.

## Excess Protein Consumption

Young athletes often meet their protein needs by following the recommendation of the U.S. Department of Agriculture and getting 15 percent of their daily calories from protein. The extra calories they eat due to the higher energy requirements of athletes usually supply the small amount of extra protein they need compared to sedentary people. Once you have met your protein needs, extra protein gets stored as fat. Consuming excessive amounts of protein puts more stress on your kidneys, increases your risk for dehydration and causes you to lose calcium from your bones.

## Protein Supplements

Protein supplements are expensive and unnecessary for teenage athletes. Most people, including young athletes, consume more protein than they need through their regular diet. Protein-rich foods like eggs are cheaper if you need to add more protein to your diet. Some protein drinks are also contaminated with dangerous heavy metals, including lead, arsenic, cadmium and mercury, according to a July 2010 report published in "Consumer Reports," making them a riskier way to get the protein you need.

## References

- [Journal of Sports Sciences: Dietary Protein for Athletes: From Requirements to Optimum Adaptation](#)
- [Alabama Cooperative Extension System: Sports Nutrition For Young Adults #1](#)
- [University of Illinois Extension: Questions Asked by Young Athletes](#)
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- [Consumer Reports: What's In Your Protein Drink?](#)

## Writer Bio

Based in Massachusetts, Jessica Brusco has been writing since 2008. She holds a master of science degree in food policy and applied nutrition and a bachelor of arts degree in international relations, both from Tufts University.

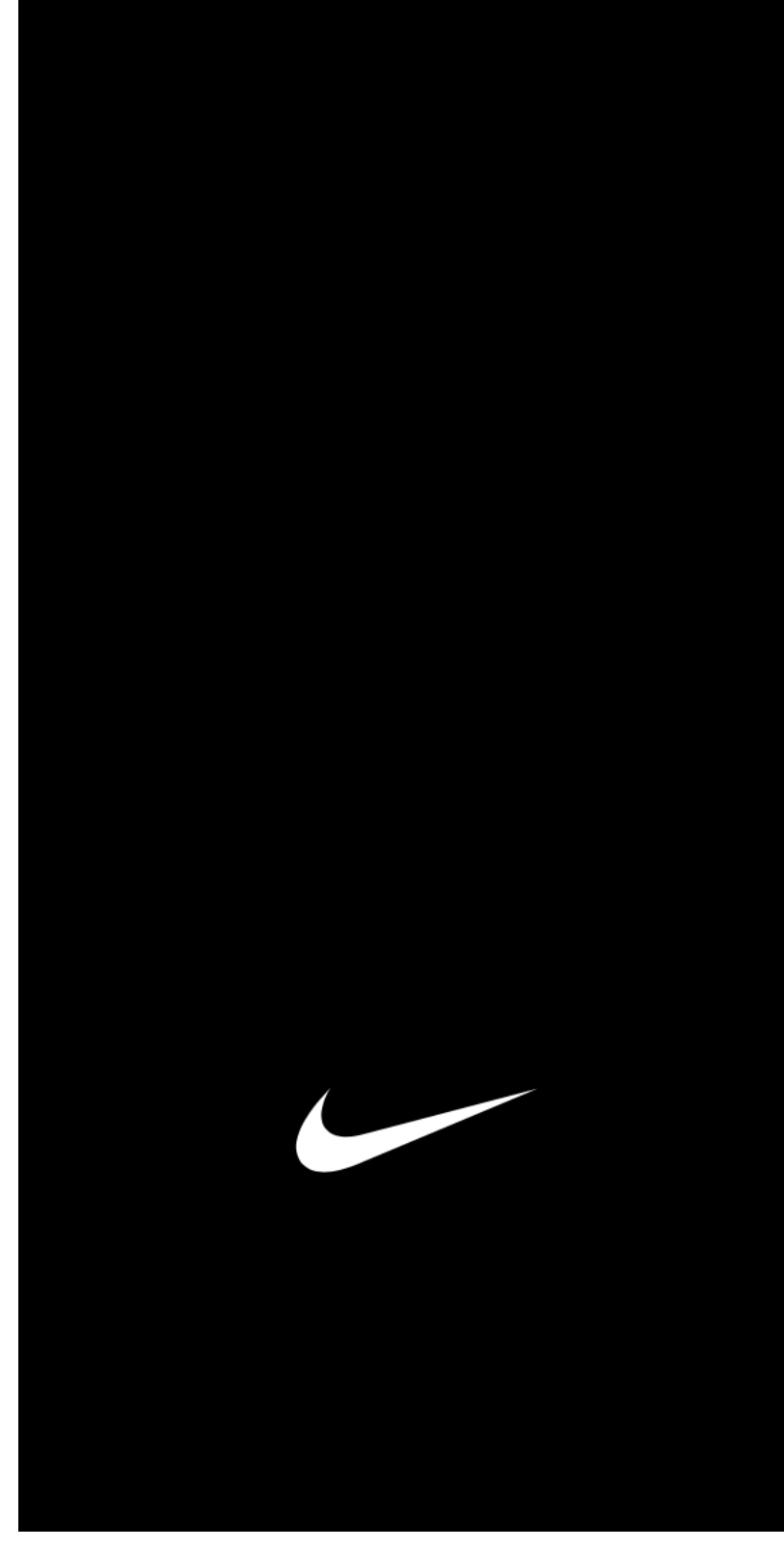


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