

# Comparing the Recommended Protein Intake to the Actual Protein Intake Among Collegiate Athletes, a Systematic Review

Sophie Loveless, Department of Health Sciences  
Carroll College, Helena, Montana

## Introduction

Protein intake needs to be higher for collegiate athletes compared to the general population because it is important for building muscle.<sup>1</sup> The typical daily protein intake recommendation for a non-athlete is 0.8 g/kg/d and the protein recommendation for endurance-based athletes is 1.2-1.4 g/kg/d compared to a strength-training athlete who is advised 1.6-1.7 g/kg/d.<sup>2</sup> For college athletes training to build or maintain muscle mass, the overall and most sufficient recommended daily protein intake ranges from 1.4 to 2.0 g/kg/d.<sup>3</sup> Additionally, 2.3-3.1 g/kg/d of protein may be necessary to retain lean body mass during hypocaloric training periods.<sup>3</sup>

When coupled with resistance exercises, increased protein intake leads to greater strength and muscle mass gains.<sup>4</sup> Due to the widespread knowledge of protein consumption enhancing muscle mass, athletes typically perceive their protein demands to be excessively higher than the true recommendation.<sup>1</sup> 67% of collegiate athletes did not know their protein needs in quantitative terms.<sup>1</sup> Although athletes recognize that they need to consume a higher amount of protein compared to the general population, they are still not aware of the objective recommendations of protein intake for their sport's needs - strength-based or endurance.<sup>1</sup> Consuming under the recommended amount of protein is not beneficial to the athlete because it contributes to suboptimal muscle integrity.<sup>4</sup> Whereas, consuming over 2.0 g/kg/d can cause detrimental effects of protein on bone, renal function, low-grade inflammation, cardiometabolic disease, and cancer risk.<sup>4</sup>

The goal of this study is to review the recommended protein intake for collegiate athletes compared to the actual protein intake.

The benefits of the findings of this study should help raise awareness about the importance of protein intake in athletes so they can maximize their targeted muscle mass. This research also brings together relevant clinical trials and research results to understand the guidelines for various collegiate sports and their ideal protein intake.

## Methods

Primary sources relevant to this systematic review were retrieved in February and March of 2022 using PubMed and Google Scholar. The search terms used in both databases are as follows, college athletes AND protein intake AND optimize muscle mass. Additional articles were obtained from the citations in sources and general searches.

The search began with 64 results identified and was narrowed down to 6 articles after duplicates and irrelevant articles were excluded. PubMed produced 21 articles and Google Scholar produced 33 articles. 43 articles were excluded because they lacked search terms and relevancy to the research topic.

In this systematic review, protein intake measurements are measured by grams per kilogram of body weight per day, g/kg/d, and grams per kilogram \* body weight, g·kg<sup>-1</sup>·bw<sup>-1</sup>.

## Results

This systematic review consisted of six observational studies and involved the participation of male and female collegiate athletes in the National Collegiate Athletic Association (NCAA).<sup>1,5-9</sup> Overall, the average protein intake of athletes, and their awareness of the recommended protein consumption, (2.0 g/kg/d) are dependent on gender. The six studies reported that on average, female athletes consume significantly under the recommended amount of protein whereas male athletes consume more protein than the Reference Daily Intake (RDI) recommendation, and both genders did not know the actual protein intake recommendation.<sup>1,5-9</sup>

These sources also found that it is necessary for college athletes to intake 1.6-1.8 g/kg/day of protein to maintain positive nutrient balance<sup>6</sup> and that 37.5-75% of college athletes were under the suggested protein intake.<sup>9</sup> In one observational study focusing on collegiate strength and power athletes, there was no significant difference in changes from the onset of a given training program in body mass, lean body mass, or body fat percentage even though lean body mass increased.<sup>6</sup> These studies did not mention the impact of protein intake on optimizing muscle mass for strength-based and endurance-based athletes but did come to a final conclusion that ~2.0 g/kg/day is the target intake of protein for college athletes.

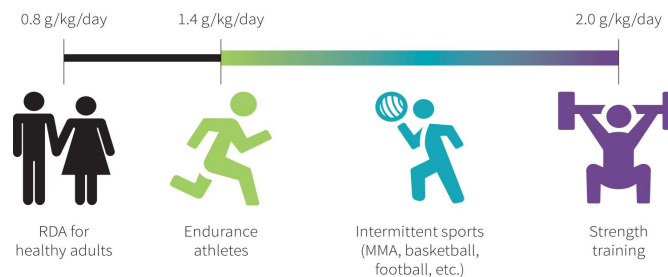


Figure 1. Recommended Protein Intake for Various Athletes.<sup>10</sup>

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## Discussion

This systematic review concludes that a protein consumption of no more than 2.0 g/kg/d is needed for a collegiate athlete to maintain optimal muscle mass. Surprisingly, female athletes consume under the suggested protein intake whereas male athletes consume more than the recommended intake.<sup>1</sup> Additionally, both female and male athletes lacked awareness of the recommended protein consumption.<sup>9</sup> However, some studies recommend that the protein consumption for college athletes should be in the range of 1.2 to 1.5 g/kg/d.<sup>5,7</sup> These athletes also received the same benefits of optimizing muscle mass as athletes with a higher protein intake.<sup>5,7</sup> Overall, an athlete's protein intake should be between 1.2 and 2.0 g/kg/d to maximize their performance.

All of the studies included in this systematic review were observational studies. A possible weakness of the observational studies would be the small sample size, with an average sample size of 43.<sup>1,5-9</sup> Recruiting a larger samples size of not only NCAA, but also NAIA athletes, will give a better look at what athletes perceive the recommended protein intake is and their actual protein consumption. Furthermore, observational studies have human bias, response bias, are difficult to replicate, and have confounding variables that may impact the athletes' answers. To try to limit and eliminate bias in observational studies, future studies should have multiple observers use different data collection methods for the same observations rather than relying on the athletes' self-report.

The purpose of the findings in this review can be used to help sports nutritionists to individualize protein consumption for athletes. It may also to help create awareness that the actual recommended protein intake is 2.0 g/kg/d, which most collegiate athletes do not know.

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Figure 2. Athlete Using Protein Powder.<sup>11</sup>