Abstract

Evaluation of the Quality Protein and the Effect on Muscle Health of a New Ingredient Based on Hydrolyzed Egg White †

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Abstract: Concerns about the growing human population and how to supply future nutritional needs have translated to a growing interest in searching for alternative proteins. However, one important aspect of protein intake to be considered is the quality of these proteins and the health benefits of these products. This a comparative study of a novel technological protein ingredient based on “hydrolyzed egg white” with different protein sources, such as pea protein, soy protein, and powder milk, evaluating the protein digestibility-corrected amino acid scores (PDCCAs) and their effects on muscular metabolism. PDCCAs are a method of determining the quality of a protein based on both the amino acid requirements of humans and their ability to digest it. An in vitro methodology has been used based on gastrointestinal digestion using a dynamic system to study the bioaccessibility of the amino acids and peptides and determine the PDCAAS, and a further study was carried out with the bioaccessible fraction in a cellular model of muscular cells (C2C12) to monitor the effect on the genes that code to myogenin, mTOR, and creatin kinase gene via rt-PCR. The results showed that the new hydrolyzed egg white-based ingredient is a high-quality protein source because the PDCAA score of all essential amino acids was higher than 1. This pattern of PDCCAs was similar to that of pea protein and slightly higher than that of concentrated soybean protein. In addition, the new ingredient in hydrolyzed egg white stimulated muscle metabolism by enhancing mTOR and myogenin gene expression in C2C12 cells. A new protein ingredient based on egg white has been developed with a proven protein quality and a healthy effect on muscle metabolism that improves protein synthesis. This new ingredient has potential in the formulation and development of new products for populations with special protein requirements, such as elderly or sportive populations, among others.

Keywords: muscle; protein; egg; health


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