

Keywords: Protein supplement; Aging; Muscle strength; Body mass, Ingredient optimized™

Introduction

Age-related changes such as a loss of muscle mass and strength, reduced physical function, and decreased fat-free mass (also known as sarcopenia) are associated with a higher risk of falling [1], longer hospitalization times [2], early institutionalization [3], and loss of independence among older individuals [4-8]. Sarcopenia, which refers to age-related muscle loss, has been linked to an increased risk of falling as well as various functional deficits [9]. This particular condition is a world-wide health problem that is consistently increasing due to the aging population.

Physical inactivity is one of the contributing factors for this condition, and subsequently numerous programs have been developed which aim at enabling elderly persons to remain at home while maintaining, or more importantly improving, physical function. However, a reduction in protein consumption is also linked to decreased muscle mass with age [10]. Indeed, large numbers of elderly persons are not currently meeting the recommended daily intake for protein and this health issue may worsen if the daily requirement increases with age as research suggests [11,12]. Research further indicates that protein supplementation can help boost muscle mass and subsequently physical function in older adults [13-15]. In particular, several systematic reviews have demonstrated that protein supplementation has positive effects on muscle strength and mass as well as muscle protein synthesis, although such studies only involved short treatment periods and the results were deemed to be of little clinical relevance [13-15]. Therefore, there is a pertinent need to better understand the

potential benefit of protein supplementation on enhancing physical function in older adults.

Previous research describes the use of Senior Fitness Tests to measure physical function in older individuals [16]. This combination of tests is widely used due to the ability to evaluate many health

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individuals between the ages of 65 and 80 who consumed an Ingredient Optimized™ (io) whey protein (referred to as ioProtein) supplement daily for 12 weeks would demonstrate significant improvements in body composition and increased physical function on Senior Physical Fitness Test measurements when compared to their counterparts who consumed a non-optimized, non-treated whey protein product. It was hypothesized that the participants who consumed ioProtein would experience heightened performance on certain fitness measurements in comparison to the control (comparator product) group. It was also proposed that improving protein supplementation could support increased fat-free mass and muscle strength in addition to enhanced physical function. Therefore, additional exploratory outcomes included: changes in body composition (fat-free mass and fat mass), muscle quality, resting metabolic rate, and different physical functions (e.g., flexibility, balance, and endurance).

Plasma Nutrition is a United States-based company that has developed a novel protein supplement through the use of atmospheric plasma which increases the key characteristics of a protein peptide.

These enhancements should heighten digestibility and absorption of Ingredient Optimized (io) whey protein leading to a potential increased bioavailability. From a functional viewpoint, ioProtein should quicken the transportation of individual amino acids into muscle fibers where enhanced protein synthesis would occur, thereby supporting increased lean muscle mass, muscle strength, and overall physical function for older adults.

To demonstrate whether Ingredient Optimized protein could improve body composition and Senior Physical Fitness Test performance after a 12-week intervention period in comparison with a non-optimized, non-treated whey protein supplement with a power of 0.80, and an alpha of 0.05, it was determined that a minimum of seven participants were needed for each supplementation group, assuming equal variation in study parameters [19]. In order to account for a 30% drop-out rate, however, 10 participants were recruited for each group. A total of 20 participants (N=20) were recruited from the community through advertisements placed in newspapers, flyers at retirement residences, radio announcements, and by informing organizations for elderly adults.

Eligibility Criteria

To be eligible for the study participants needed to: 1) be between 65

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Overall, sustaining and/or enhancing physical function in elderly persons is crucial towards their ability to live independently. As the results of this 12-week study support the proposed health benefits of protein supplementation, future investigations will aim at evaluating the benefits in a clinical population such as older adults with dynapenic obesity or the comparison of ioProtein to an exercise program and a placebo treatment. Finally, it will be necessary to conduct a study which is longer than 12 weeks in order to assess the long-term effects and safety of protein supplementation in an older population.

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