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Research article

The Effects of Pre- and Post-Exercise Whey vs. Casein Protein Consumption on Body Composition and Performance Measures in Collegiate Female Athletes

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ABSTRACT

Two of the most popular forms of protein on the market are whey and casein. Both proteins are derived from milk but each protein differs in absorption rate and bioavailability, thus it is possible that each type of protein may contribute differently to the adaptations elicited through resistance training. Therefore, the purpose of this study was to investigate the potential effects of ingestion of two types of protein in conjunction with a controlled resistance training program in collegiate female basketball players. Sixteen NCAA Division III female basketball players were matched according to body mass and randomly assigned in a double-blind manner to consume 24 g whey protein (WP) (N = 8, 20.0 ± 1.9 years, 1.58 ± 0.27 m, 66.0 ± 4.9 kg, 27.0 ± 4.9 %BF) or 24 g casein protein (CP) (N = 8, 21.0 ± 2.8 years, 1.53 ± 0.29 m, 68.0 ± 2.9 kg, 25.0 ± 5.7 %BF) immediately pre- and post-exercise for eight weeks. Subjects participated in a supervised 4-day per week undulating periodized training program. At 0 and 8 weeks, subjects underwent DXA body composition analysis, and at 0 and 8 weeks underwent one repetition maximum (1RM) strength, muscle endurance, vertical jump, 5-10-5 agility run, and broad jump testing sessions. Data were analyzed using repeated measures ANOVA, and presented as mean ± SD changes from baseline after 60 days. No significant group x time interaction effects were observed among groups in changes in any variable (p > 0.05). A significant time effect was observed for body fat (WP: -2.0 ± 1.1 %BF; CP: -1.0 ± 1.6 %BF, p < 0.001), lean mass (WP: 1.5 ± 1.0 kg; CP: 1.4 ± 1.0 kg, p < 0.001), fat mass (WP: -1.3 ± 1.2 kg;

CP: -0.6 ± 1.4 kg, $p < 0.001$), leg press 1RM (WP: 88.7 ± 43.9 kg; CP: 90.0 ± 48.5 kg, $p < 0.001$), bench press 1RM (WP: 7.5 ± 4.6 kg; CP: 4.3 ± 4.5 kg, $p = 0.01$), vertical jump (WP: 4.1 ± 1.8 cm; CP: 3.5 ± 7.6 cm, $p < 0.001$), 5-10-5 (WP: -0.3 ± 0.2 sec; CP: -0.09 ± 0.42 sec, $p < 0.001$), and broad jump (WP: 10.4 ± 6.6 cm; CP: 12.9 ± 7.1 cm, $p < 0.001$). The combination of a controlled undulating resistance training program with pre- and post-exercise protein supplementation is capable of inducing significant changes in performance and body composition. There does not appear to be a difference in the performance-enhancing effects between whey and casein proteins.

Key words: whey, casein, protein, females, body composition, performance

Key Points

- Females can experience and increase in performance markers from consuming protein after resistance training.
- Females can have a decreased body fat composition when ingesting protein with daily resistance training and conditioning.
- There was no significant difference in performance markers between whey and casein.

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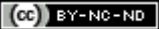
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