

Effects of Pre- and Post-Exercise Protein vs. Carbohydrate Ingestion on Training Adaptations in Collegiate Female Athletes

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ABSTRACT

The role of nutrient timing both before and after daily training sessions is now a major part of the nutritional recommendations for athletes to maximize training adaptations. However, there still exists some questions on the ideal macronutrient selection for these pre- and post-workout meals. **PURPOSE:** To investigate the potential effects of protein vs. carbohydrate ingestion in collegiate female basketball players. **METHODS:** 14 (20.2 ± 1.4 years, 169.4 ± 5.8 cm, 67.5 ± 6.1 kg, 27.1 ± 4.4 %BF) NCAA Division III female basketball players were matched by weight and randomly assigned in a double-blind manner to consume 24 grms whey protein (WP) or 24 grms maltodextrin (MD) pre- and post-exercise for eight weeks. Subjects participated in a supervised 4-day per week undulating periodized resistance and anaerobic training program. At 0 and 8-weeks, subjects underwent DEXA body composition analysis and upper- and lower-body 1RM strength, vertical jump, 5-10-5, and broad jump testing. Data were analyzed using repeated measures ANOVA ($p \leq 0.05$) and are presented as mean \pm SD changes. **RESULTS:** Significant group \times time interaction effects were observed among groups for bench press 1RM ($p = 0.043$) and DEXA lean mass ($p = 0.026$) indicating that the WP group resulted in a more substantial training adaptations over the MD group. A significant time effect ($p < 0.05$) was observed for DEXA %BF (%change: $-4.87 \pm 4\%$), DEXA fat mass (%change: $-4.33 \pm 5\%$), leg press 1RM (%change: $13.57 \pm 7\%$), vertical jump (%change: $9.95 \pm 6\%$), 5-10-5 (%change: $-3.1 \pm 2\%$), and broad jump (%change: $3.9 \pm 4\%$) suggesting that the stimulus of the training protocol was adequate to promote anaerobic physiological adaptations. **CONCLUSION:** In regards to nutrient timing, our results suggest that whey protein ingestion both pre- and post-training is a greater stimulus for increases in lean mass in female collegiate anaerobic athletes as compared to the ingestion of carbohydrates. This translated into a significant difference in upper body 1RM strength, however, despite significant training adaptations occurring over the 8 week trial, no significant differences occurred in lower body strength, vertical and broad jump, and 5-10-5 time between WP and MD groups.

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