Measuring Increases on Anaerobic Power by Verified and Non-Verified Pre-Workout Supplements

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ABSTRACT

INTRODUCTION: Anaerobic exercise is often defined as any short-duration exercise that is powered primarily by metabolic pathways that do not use oxygen. The Wingate test measures peak power and anaerobic capability. The main energy system powering anaerobic exercise is the ATP-PC system, however, during the Wingate test the glycolytic pathway also provides some of the energy. Pre-workout supplements are used as aids to increase tolerance and muscle contractility and provide a short burst of energy during physical activity.

PURPOSE: The aim of this experiment is to investigate the effects of reviewed vs non-reviewed pre-workout supplements on anaerobic power and to determine the overall effectiveness of each supplement.

METHODS: 11 men (M; age 23.27 ± 2.37 yrs) who currently or previously attended college all volunteered to participate in this study. Participants completed a demographic questionnaire and each subject's height and weight was recorded. A counter-balancing method was used to organize the order in which each subject ingested Supplement A (non-verified) and B (verified). Subjects then ingested the appropriate supplement, Swollen (Supplement A) or Arginine Extreme by AdvoCare (Supplement B). Subjects waited 20 minutes before beginning the Wingate Test which was performed on a Lode Excalibur Sport cycle ergometer. The bicycle ergometer seat was adjusted according to the subject's leg length. The subject pedaled as fast as possible or 30 seconds, then pedaled slowly during a recovery period of 1-3 minutes. Peak power, expressed in kg/s, was recorded.

RESULTS: Mean peak power for Supplement A was 1080.7273 ± 255.92737 kg/sec. Mean peak power for Supplement B was 1010.1818 ± 287.99160 kg/sec. A statistical difference did not exist between the mean peak powers of Supplement A and Supplement B (P = 0.138). However, there was a significant order effect between Supplement A (P = 0.004) and Supplement B (P = 0.003).

CONCLUSION: The results of this study indicate that there are no statistical differences between the verified and non-verified pre-workout supplements. A significant order effect showed differences in mean peak power for Trial 1 and Trial 2.

BACKGROUND & PURPOSE

- Anaerobic exercise is defined as any short-duration exercise that is powered primarily by metabolic pathways that do not utilize oxygen.
- Supplement A (non-verified) and Supplement B (verified) were chosen because both are arginine-based supplements containing caffeine.
- Peak power was the primary focus of our experiment and how it was impacted by arginine-based supplementation.
- The aim of this experiment was to investigate the effects on anaerobic peak power by a reviewed versus a non-reviewed pre workout supplement.

METHODS

- Sample of 11 males between the ages of 20 and 29 years old. No apparent health complications.
- Participants filled out a questionnaire asking about how much they exercised, the amount of caffeine consumed, and any supplements consumed within the last 24 hours.
- Age, height, and weight were also included in this demographic.
- Trial 1 and Trial 2, where subject took either Supplement A, or Supplement B. 20 minute waiting period was instituted before beginning test.
- One minute warm-up period on the Lode Excalibur Sport cycle ergometer followed by a 30-second maximum exertion graded-exercise test (Wingate test).
- Upon completion of testing, subjects were given the option of a 1-3 minute cool down period.
- An independent t-test was used to analyze any possible order effects.
- A dependent t-test was used to determine if there was a statistical significant difference between anaerobic peak power when ingesting Supplement A or Supplement B.

Supplement A (Non-verified)

Supplement B (Verified)

RESULTS

	Mean (kg/sec)	N	Std. Deviation
Sup. A	1080.7273	11	255.92737
Sup. B	1010.1818	11	287.99160

- *t(10)=1.612, P=0.138*

	Order	Mean (kg/sec)	Std. Deviation
Sup. A	1.0	1291.0000	217.15547
	2.0	905.5000	110.50928
Sup. B	1.0	1249.8000	221.76609
	2.0	810.5000	145.84204

- *t(9)=3.822 , P=0.004 (Sup. A); t(9)=3.953, P=0.003 (Sup. B).* There was a significant order effect between Supplement A and Supplement B.

DISCUSSION & CONCLUSION

- Possible limitations of the data collection can be attributed to varying levels of physical fitness in participants.
- Each participant tested at various times of the day.
- The possibility of subjects ingesting caffeine prior to testing could have interfered with peak power levels.
- Although counter-balancing was used, a lack of motivation to perform well during the second wave of testing and familiarity with the Wingate test could have interfered with the results.
- Muscular fatigue is especially a factor for peak power, specifically if the legs had been exercised 24-48 hours prior to testing.
- For future studies, a longer testing period and a larger sample size would be preferential.

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