A randomized crossover, double-blinded, placebo-controlled study of the effects of acute oral ingestion of Bang® Pre-Workout Master Blaster™ on exercise performance and clinical safety markers

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Introduction

Bang® Pre-Workout Master Blaster™ (Figure 1) is a multi-ingredient pre-workout supplement developed by Vital Pharmaceuticals Inc. (VPX). Bang® contains a unique carbohydrate blend consisting of hydroxypropyl distarch phosphate and highly branched cyclic dextrin in combination with a novel creatyl-L-leucine peptide. In addition, Bang® contains branched-chain amino acids (BCAA's), L-citrulline malate, creatine monohydrate, betaine anhydrous, beta-alanine, and caffeine. The ingredients contained within Bang® are purported to enhance adaptation from resistance exercise through a variety of mechanisms as demonstrated by previous individual ingredient studies or by studies of the ingredients contained within other multi-ingredient supplements.

The purpose of this placebo-controlled, double-blind, crossover study was to determine the effects of acute oral ingestion of nutritional supplements containing either placebo (Fibersol-2) or VPX Bang® Pre-Workout Master Blaster™) on exercise performance, human growth hormone (HGH), insulin-like growth factor-1 (IGF-1), cortisol, and clinical safety markers in resistance-trained men.

Supplement Facts

Serving Size 1 Pack (26.1 g)

	Amount Per Serving	% Daily Value
Calories	4	
Total Carbohydrate	1.0 g	0%*
Hydroxypropyl distarch phosphate	990 mg	**
Highly branched cyclic dextrin	10 mg	**
Branched-Chain Amino Acids	7500 mg	**
L-Leucine	3000 mg	**
L-Isoleucine	3000 mg	**
L-Valine	1500 mg	**
L-Citrulline Malate 2:1	6000 mg	**
Creatine Monohydrate	5000 mg	**
Betaine Anhydrous	2500 mg	**
Beta-Alanine	2400 mg	**
Caffeine Anhydrous	350 mg	**
Creatyl-L-Leucine [Super Creatine™]	250 mg	**

*Percent Daily Values are based on a 2,000 calorie diet.
**Daily Value not established.

Figure 1. Bang® Preworkout Master Blaster™ Supplement Facts.

Methods

Participants

Ten resistance-trained men completed the study (22.40 ± 1.43 years, height of 177.29 ± 5.94 cm, and total body mass of 87.36 ± 13.39 kg). Participants visited the lab four times (Entry Session, Familiarization Session, two Exercise Testing Sessions).

Entry Session

An overview of the study design is outlined in Figure 2. Participants were familiarized to the study protocol via a verbal and written explanation outlining the study design and signed an informed consent document approved by the IRB of the University of South Alabama. A medical history questionnaire was completed and then a general physical examination (height, weight, blood pressure, heart rate) performed. At the end of the Entry session, approximately 11 mL of blood was drawn for completion of a comprehensive metabolic panel (CMP) and complete blood count with differential (CBC). The results of the entry session blood tests served as the baseline results for the safety markers for both exercise testing sessions.

Familiarization Session

Before the Familiarization and Testing sessions, the participants were asked to refrain from exercise for 48 hours. During the Familiarization session, one-repetition maximum (1-RM) for both the bench press (BP) and leg extension (LE) exercises were assessed. After, participants were familiarized with the muscle power (vertical jump (VJ) and seated medicine ball throw (SMBT)) and endurance (BP and LE at 70% of 1-RM to fatigue) tests performed during the exercise testing sessions. Participants were instructed to complete a diet recall for 3 days prior to each Testing session using the Automated Self-Administered 24 hour Recall (ASA24) system created by the National Cancer Institute.

Methods (cont.)

Exercise Testing Sessions

On the day of the testing sessions, participants were asked to confirm that they have restrained from any form of exercise for 48 hours and have fasted for 8 hours (except from water) prior to the testing session. Resting heart rate, blood pressure, venous blood samples were obtained (**Baseline; BL**). Participants then consumed one serving of Bang® or placebo. After ingestion, participants were asked to rest for 30 min after which resting heart rate, blood pressure, and venous blood samples were obtained again (**30-min Post Supplement; 30PS**). After, the participant performed the VJ test from which the greatest jump height was recorded. Then, the SMBT was performed and the greatest distance recorded. A BP endurance test and LE endurance test for repetitions utilizing a load of 70% of 1-RM were then performed. The number of successful repetitions before muscular failure for each test was recorded. Then, participants rested for 30 minutes upon completing the exercise protocol at which time heart rate, blood pressure, and venous blood samples were obtained (**30-min Post Exercise; 30PX**). For the second testing session, the participant completed the exact same protocol with the exception of the supplement consumed. Order of supplement consumption was randomized and uniform-balanced.

Statistical Analyses

Separate 2x3 (trial x time) two-way repeated measures ANOVA were run for each variable to determine the effect of each trial over time on hemodynamics and serum hormone concentrations. Paired-samples t-tests were employed to compare performance measures and dietary analyses.

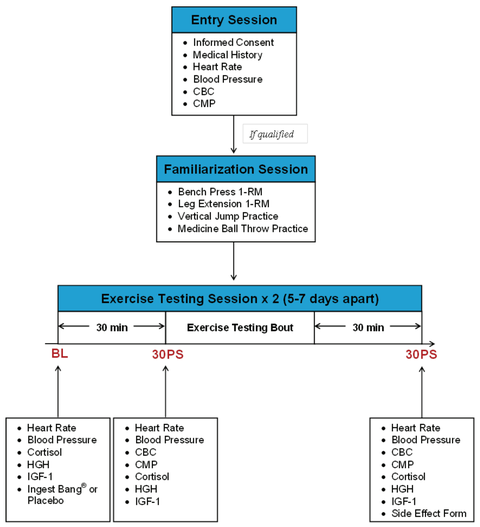


Figure 2. Overview of Study Design.

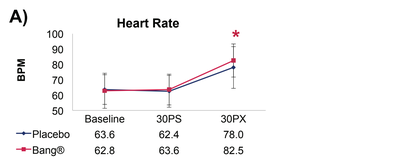
Results

Dietary Analyses

No difference in total kilocalories, protein, fat, or protein intake was observed between the two testing sessions (all variables $p > 0.05$).

Hemodynamics (Figure 3)

Statistical significance was observed for time ($p < 0.001$) for heart rate with no statistical significance observed for trial or trial x time. Heart rate (Figure 1, A) was significantly increased at 30PX compared with BL ($p < 0.001$) and 30PS ($p < 0.001$). No significant difference was observed for time, trial, or trial x time for systolic blood pressure (Figure 2). For diastolic blood pressure, significance was observed for time ($p < 0.001$) with no significance observed for trial or trial x time. Diastolic blood pressure (Figure 3) was significantly higher 30PS compared with BL, with no difference between 30PS and 30PX.



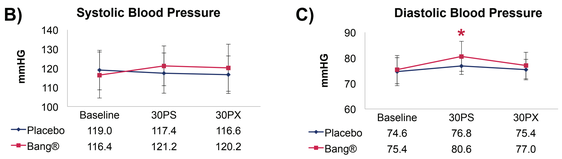


Figure 3. Heart rate (**A**), systolic blood pressure (**B**), and diastolic blood pressure (**C**) responses to supplement ingestion and exercise. (*) denotes statistical difference from baseline for both groups.

Performance Measures (Table 1)

Vertical jump ($p < 0.01$) and LE repetitions ($p < 0.05$) were significantly greater for the Bang® trial compared with placebo. No significant difference between trials was observed for SMBT distance or BP repetitions.

Table 1. Results of Performance Tests

Performance Test	Supplement	
	Placebo	Bang®
Vertical Jump (cm)	59.3 ± 11.5	61.5 ± 11.2*
Seated Medicine Ball Throw (m)	5.6 ± 1.0	5.7 ± 0.9
Bench Press (reps)	16.7 ± 1.4	17.4 ± 1.8
Leg Extension (reps)	22.2 ± 2.4	24.8 ± 3.8*

Note. (*) denotes statistical difference between groups.

Serum Hormones (Figure 4)

A significant main effect for time was observed for cortisol ($p = 0.02$) and HGH ($p = 0.011$) with no significant effect for trial or between trial and time. Cortisol was decreased at 30PS compared with BL ($p = 0.003$). HGH was greater at 30PX compared with BL ($p = 0.009$) and 30PS ($p = 0.014$). A trend for HGH to be higher at 30PX for the Bang® trial compared with the placebo trial ($p = 0.10$) was noted. A significant interaction between trial and time was observed for IGF=1 ($p = 0.044$). There was a significant effect of time for the Bang® trial ($p = .010$). IGF-1 was significantly increased at both 30PS ($p = 0.004$) and 30PX ($p = 0.038$) compared with BL for the Bang® trial. No effect of time for IGF-1 was observed for placebo.

Results (cont.)

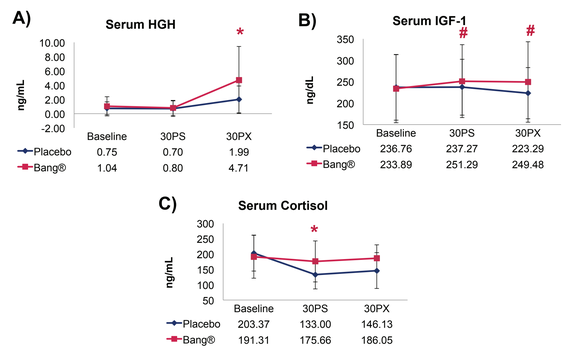


Figure 4. Serum Human Growth Hormone (HGH, **A**), serum insulin-like growth factor-1 (IGF-1, **B**), and serum cortisol (**C**) responses to supplement ingestion and exercise. (*) denotes statistical difference from baseline for both groups. (#) denotes statistical difference from baseline for Bang® trial.

Whole Blood and Clinical Chemistry Markers

The CBC w/diff and CMP tests resulted in 1,424 data points. Of the 1,424 data points, only 54 test results (3.8%) were out of normal range. The distribution of the abnormal results was 24.1% for the entry session, 27.8% at 30PS for placebo, 22.2% at 30PS for Bang® , 11.1% at 30PX for placebo, and 14.8% at 30PX for Bang® ; therefore, there was no association between trial or time point for abnormal (out-of-range) test results. Mean values for all variables fell within the normal range for each.

Conclusions

Acute ingestion of Bang® Pre-Workout Master Blaster™ increased lower-body power and endurance as measured by the vertical jump and leg extension repetition tests, respectively. Additionally, Bang® supplementation resulted in potentially favorable serum IGF-1 and HGH responses without adversely affecting clinical safety markers. Future research should be completed to test the effects of this supplement on chronic adaptations to resistance training.

Disclosure of Funding Source

Vital Pharmaceuticals Inc. (VPX) provided Neil Schwarz the funding needed to conduct the study. The authors have no financial interests as a result of the outcome of this study,