



The Effect of Beta-Alanine on Peak Anaerobic Power and Blood Lactate Levels

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Introduction

- Beta-alanine is an increasingly popular dietary supplement that sometimes is promoted as a performance enhancer (7).
- Oral supplementation with the amino acid beta-alanine increases muscle content of the dipeptide carnosine (beta-alanyl-L-histidine) and has positive effects on some short high-intensity exercise tasks (4).
- Consumption of various individual ingredients often included in proprietary pre-workout blends are known to effectively increase time to fatigue, allowing for an increased training volume (12).
- Carnosine acts as an intracellular buffer during high-intensity exercise, and elevations in muscle carnosine concentration have been demonstrated to enhance cycling capacity, ventilatory threshold, and delay fatigue (9).

Purpose

•The purpose of this study was to determine if taking a dietary supplement (beta-alanine) will increase anaerobic power which does not require the transportation of oxygen throughout the cardiovascular system and blood lactate levels which direct the pH levels/acidity of the blood. The null hypothesis was that there will be no significant difference in blood lactate levels, peak anaerobic power, average power, or total work with the consumption of a beta-alanine.

Methods

- Four women and one male (age 23.50 ± 1.86 yrs) from UTA.
- This study was conducted on two separate days, where the subjects would have their finger pricked to analyze the blood lactate using a capillary tube attached to a reflation applicator to collect the blood. They then consumed two pills of either a placebo (sugar pill) or Beta-Alanine supplement in a randomized order. Their finger would then be pricked a second time to analyze the blood lactate. A series of 7 skinfold measures were used to assess their body fat percentage using skin calipers. The waist to hip ratio was then assessed using a measuring tape. The subject then performed four dynamic stretch warm-ups. The subject performed a 2 minute warm-up on the Wingate bike, followed by having the subject pedal as fast and hard as possible for 30 seconds. The subject then took a 4 minute break, 10. A second WAnT was performed immediately after the 4 minute break. Lastly, the subject had their finger pricked a third time to analyze their blood lactate level.

Methods (cont'd)

•On the second day the subject came in the same procedures were repeated and the placebo or Beta-Alanine pill that was not consumed on day one was taken.

Variable	Mean	± SD
Age(years)	23.50	1.86
Weight (kg)	67.67	9.81
Height (cm)	169.67	7.43
Body Fat (%)	23.94	2.91
WHR (in)	0.84	0.05

Results

- The peak power of the placebo was 646 ± 98.86 W, and for beta-alanine 620.67 ± 88.19 W.
- The average power of the placebo was 404 ± 52.86 W, and for beta-alanine 368.17 ± 42.14 W.
- The total work for the placebo was 9825.67 ± 42.14 J, and for beta-alanine 11045 ± 1264.29 J.
- The blood lactate level for the placebo was 14.27 ± 0.65 mmol/L, and the beta-alanine 14.65 ± 1.06 mmol/L.
- The comparison between the placebo and beta-alanine trials in each variable showed no significant difference ($p > 0.05$).

- Blood lactate ($p = 0.63$)
- Peak power ($p = 0.79$)
- Average power ($p = 0.41$)
- Total work ($p = 0.56$)

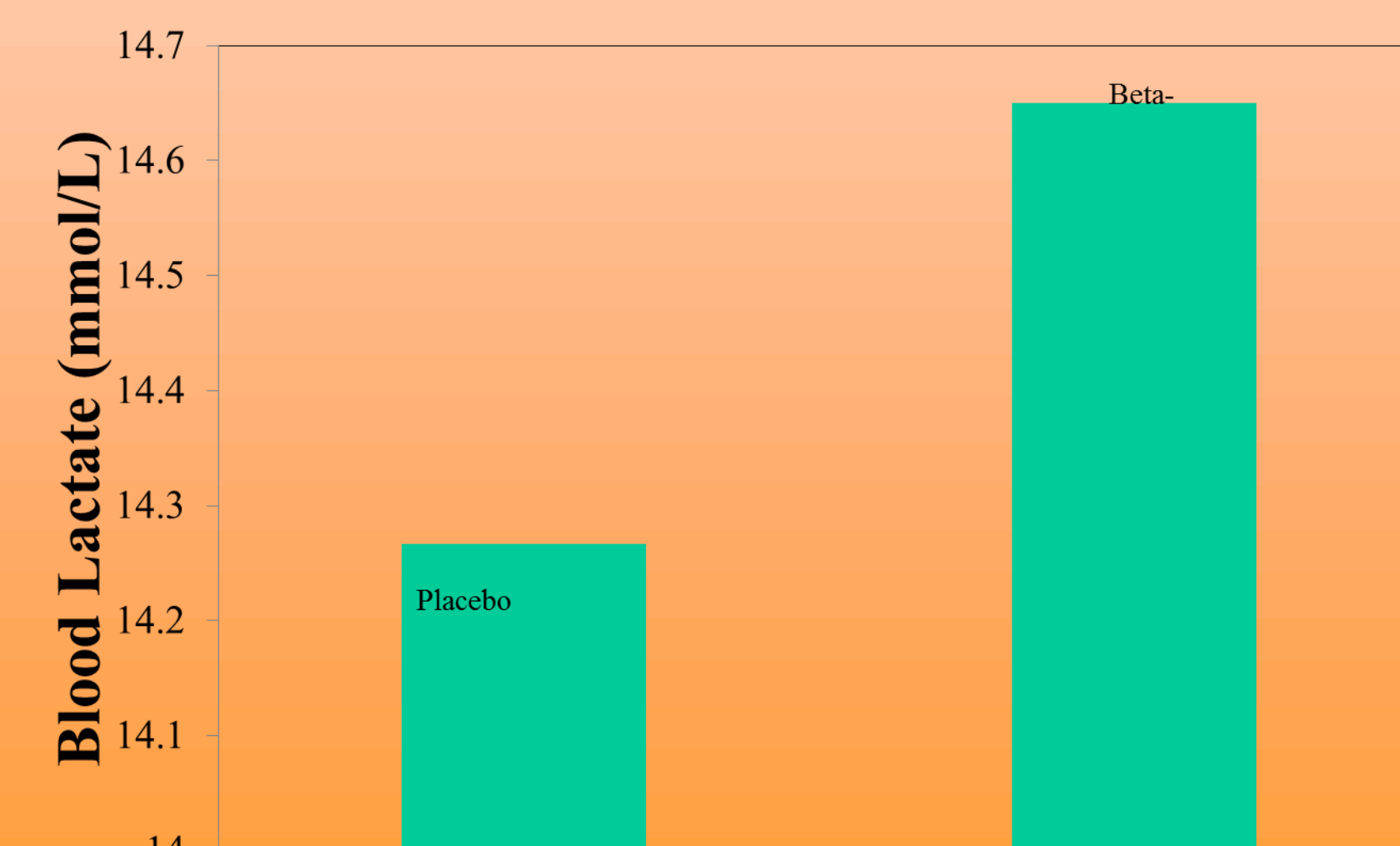


Figure 1: The Average Between Consuming A Placebo And Beta-Alanine On Blood Lactate Levels

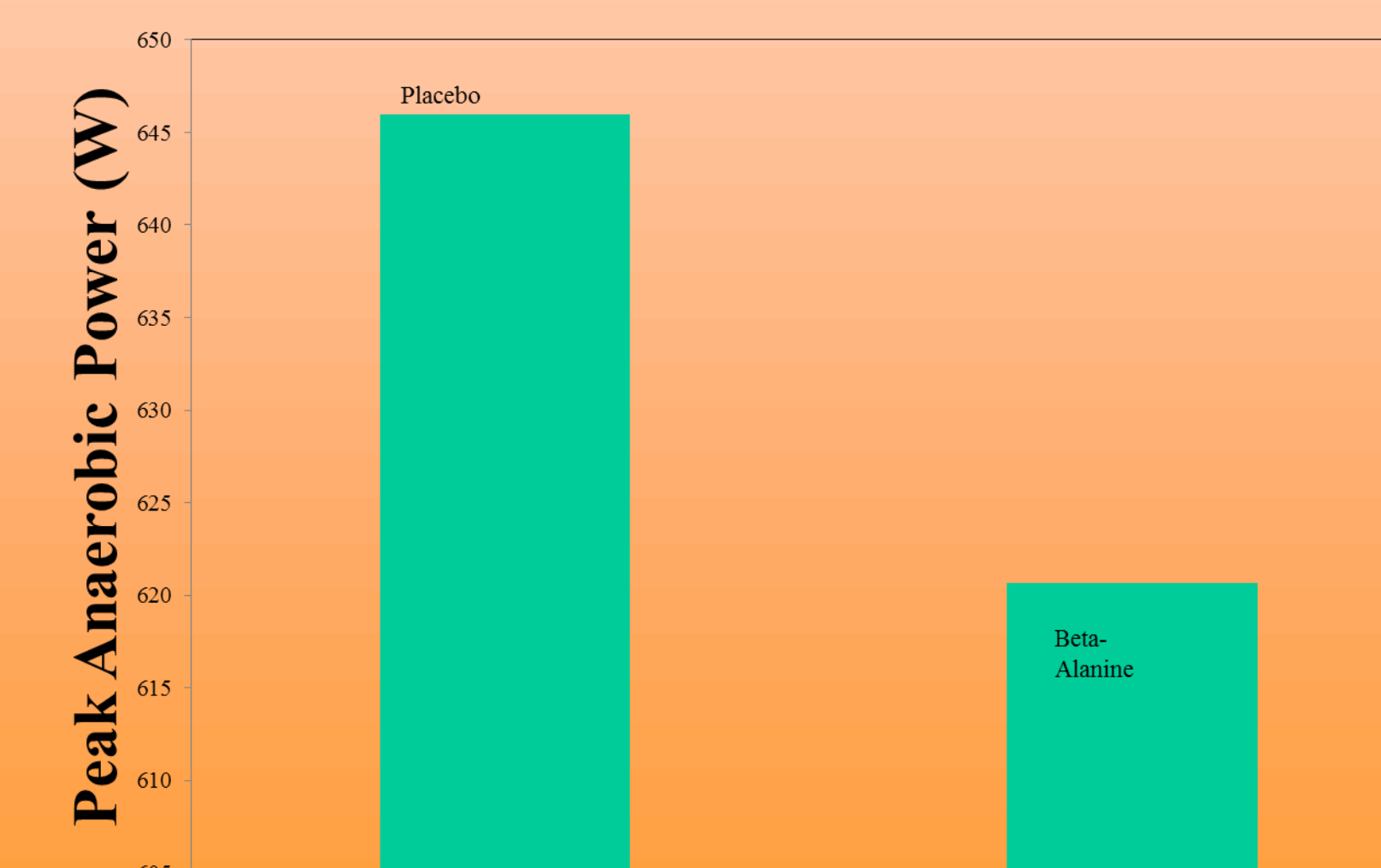


Figure 2: The Average Between Consuming A Placebo And Beta-Alanine On Peak Anaerobic Power

Results (cont'd)

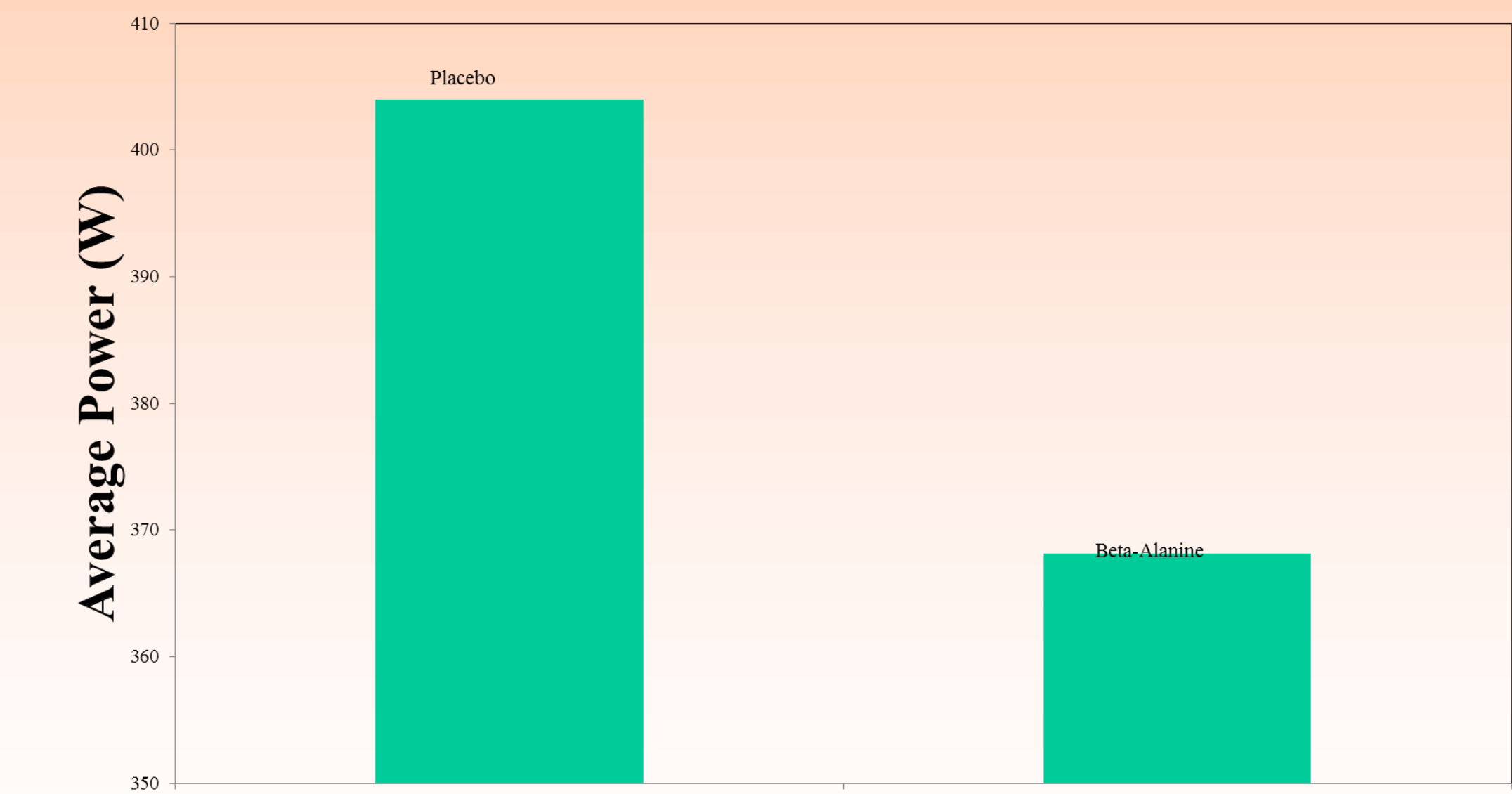


Figure 3: The Average Between The Consumption Of A Placebo And Beta-Alanine On Average Power

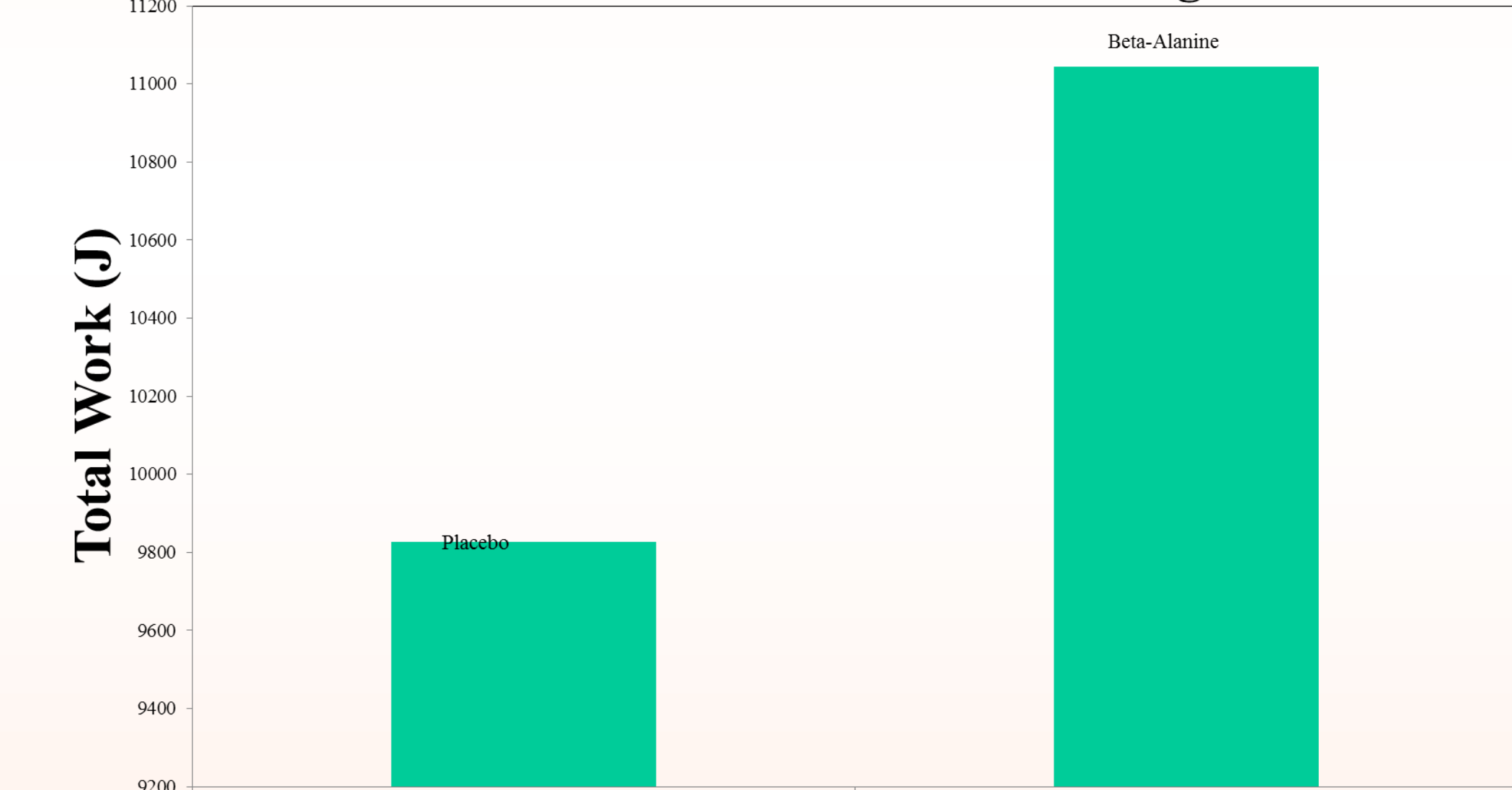


Figure 4: The Average Between Consuming A Placebo And Beta-Alanine On Total Work



Conclusions

- The results generated from the experiment show that there is no significant difference in blood lactate, peak power, average power, and total work done after consuming beta-alanine.
- Findings do not support the research that beta-alanine supplementation has increased the number of repetitions to fatigue and overall work capacity (12), or shown improvements in body composition, exercise performance and blood lactate levels (8).