

POSTER PRESENTATION

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# The effect of three different energy drinks on oxygen consumption and perceived exertion during treadmill exercise

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## Background

Some energy drink manufacturers claim that their products can increase athletic performance. However, there are no studies to assess the effect of these energy drinks on oxygen consumption ( $VO_2$ ) or ratings of perceived exertion (RPE) during exercise. If these energy drinks improve performance,  $VO_2$  and RPE would likely be reduced during any given exercise intensity.

## Methods

Fifteen ( $22.1 \pm 2.7$  years old) participants completed the study. Maximal oxygen consumption ( $VO_2$  max) was initially measured to establish each participant's exercise for the 70% treadmill exercise protocol after ingesting an energy drink. Following  $VO_2$  max testing, all participants completed a total of four conditions. Each condition required a participant to ingest an energy drink then rest in a seated position for one hour. Following one hour of rest, participants exercised for a total of 15 minutes on a treadmill at 70% of their  $VO_2$  max. For each condition, participants blindly ingested one of four price-matched beverages (12 oz. placebo (Squirt), 8.4 oz. Red Bull<sup>®</sup>, 16 oz. Monster Energy<sup>®</sup>, 2 oz. 5-hour ENERGY<sup>®</sup>). Relative  $VO_2$  ( $ml.kg^{-1}.min^{-1}$ ) and RPE (6-20 Borg Scale) were recorded each minute during the treadmill exercise and averaged in five-minute increments and as an average for each 15-minute condition.

## Results

Analysis of variance revealed there was no significant main effect of energy drinks on average  $VO_2$  (placebo  $35.8 \pm 2.3 ml.kg^{-1}.min^{-1}$ ; Red Bull  $35.4 \pm 2.3 ml.kg^{-1}.min^{-1}$ ;

Monster  $35.8 \pm 2.2 ml.kg^{-1}.min^{-1}$ ; 5-hour  $36.5 \pm 2.4 ml.kg^{-1}.min^{-1}$ ;  $p \geq .482$ ) and RPE (placebo  $12.2 \pm 0.6$ ; Red Bull  $12.6 \pm 0.5$ ; Monster  $12.0 \pm 0.5$ ; 5-hour  $11.7 \pm 0.5$ ;  $p \geq .179$ ) during 15 minutes of treadmill exercise.

## Conclusions

Energy drinks do not appear to improve perceived treadmill exercise performance nor running economy assessed via oxygen consumption at 70% treadmill exercise. Given that no significant reductions were found in  $VO_2$  and RPE post energy drink consumption, results do not support manufacturers' claims regarding their product's ability to boost performance. Additional research is needed to assess time trial or time to exhaustion sprint and endurance performance. Time trials and time to exhaustion may better assess if these energy drinks can, in fact, improve exercise performance.

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