



ENERGY DRINK VS. SPORT DRINK ON MAX EXERCISE TEST PERFORMANCE

Sadie Wright: Cardiovascular Research Laboratory, The University of Texas at Arlington, Arlington, TX; KINE 4400, 5/1/13



Abstract

ENERGY DRINK VS. SPORT DRINK ON MAX EXERCISE TEST PERFORMANCE
 Author: Sadie Wright
 Faculty Sponsor: J.R. Wilson, Ph.D.

INTRODUCTION: Maximal oxygen consumption (VO₂max) is the maximum capacity of the body to transport and utilize oxygen during incremental exercise. VO₂max can be expressed as either an absolute rate in liters of oxygen per minute (L/min) or as a relative rate in milliliters of oxygen per kilogram of body weight per minute (ml/kg/min). Consumption of energy drinks and sport drinks are very popular among the athlete and non-athlete population today. Energy drinks have been said to decrease fatigue and increase mental focus, alertness, and endurance performance. Sport drinks have also been advertised to decrease the rate of muscle glycogen breakdown, therefore prolonging endurance exercise. Research has shown that energy drinks can improve endurance while exercising, and carbohydrate supplements can have large benefits on endurance performance.

PURPOSE: The specific purpose of this research study was to see which is more beneficial on performance in a VO₂max exercise test: an energy drink (Red Bull) or a sports drink (Gatorade)

METHODS: Five healthy, physically active college students (age 22.2 ± 1.6 years; weight 157.4 ± 45.7 lbs.; height 69.0 ± 6.9 in) from the University of Texas at Arlington volunteered to participate in this study. Each subject came into the lab twice, each visit being one week apart. On the first visit, the subject had their body fat percent taken from a Bioelectrical Impedance Analysis machine (15.4 ± 9.0 %). Each subject consumed 5 ml/kg/body weight of either Gatorade or Red Bull, and then waited twenty minutes before beginning the exercise test. Each subject performed a graded exercise test on the treadmill following the Bruce protocol. The treadmill increases in speed and elevation every three minutes, and the subject exercises until exhaustion. During the test, the subject's heart rate (HR) and rate of perceived exertion (RPE) were recorded every three minutes. The metabolic cart recorded the relative maximal oxygen consumption (VO₂max), and the time of exercise was recorded once the subject reached exhaustion and went into recovery mode. The subject then recovered for five minutes before they were able to leave. Once the first visit was done, each subject came back into the lab a week later to perform the same protocol after consuming the other drink.

RESULTS: The maximal values: HR (RB: 189.2 ± 6.6 bpm; G: 189.2 ± 3.3 bpm); RPE (RB: 17.8 ± 1.5; G: 18.2 ± 0.7); VO₂max (RB: 40.5 ± 10.9 ml/kg/min; G: 39.8 ± 7.2 ml/kg/min) were not significantly different between the 2 different drinks (p>0.05). Also, there was no statistically significant difference (p>0.05) between Red Bull (11:40 ± 0.09 mins) and Gatorade (12:09 ± 0.08 mins) for the duration of exercise

CONCLUSION: The results of this study indicate that Red Bull and Gatorade have the same effect on max exercise performance. No drink proves to be more beneficial than the other. Further studies should be done to gain additional knowledge in this area.

Purpose

The specific purpose of this research study was to see which is more beneficial on performance in a VO₂max exercise test: an energy drink (Red Bull) or a sports drink (Gatorade).

Methods

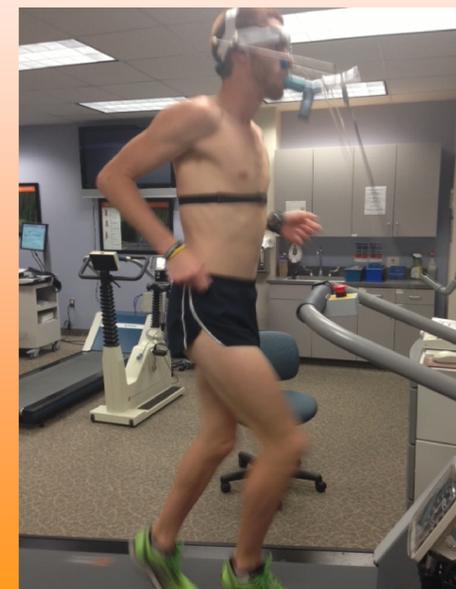
- Five physically active college students (3 males, 2 females) from the University of Texas at Arlington volunteered to participate in this study

Age (years)	Height (in)	Weight (lbs.)	Body Fat %
22.2 ± 1.6 years	69.0 ± 6.9 in	157.4 ± 45.7 lbs.	15.4 ± 9.0%

- **Instrumentation:**
 - A bioelectrical impedance device was used to analysis each subject's body fat percent. A heart rate monitor was attached to each subject's chest to monitor heart rate. Headgear was fitted to the subject's head, a mouthpiece was inserted into the subject's mouth, and a nose clip was worn in order to measure oxygen consumption by the sensormedics metabolic cart
- Randomized cross-over design

Methods (cont'd)

- Each subject consumed 5 ml/kg/body weight of either Red Bull or Gatorade upon arriving to the lab
- After 20 minutes, the subject begin the exercise test on a treadmill
- The Bruce protocol was used: increasing speed and elevation every 3 minutes
 - 1st stage- 1.7 mph at 10% grade
 - 2nd stage- 2.5 mph at 12% grade
 - 3rd stage- 3.4 mph at 14% grade
 - 4th stage- 4.2 mph at 16% grade
 - 5th stage 5.0 mph at 18% grade
 - 6th stage- 5.5 mph at 20% grade
 - 7th stage- 6.0 mph at 22% grade
- Heart rate and RPE was recorded every 3 minutes
- Subject exercised until exhaustion
- Time of exercise was recorded once subject stopped the protocol and went into recovery mode
- Subject recovered for 5 minutes at 1.7 mph and 0% grade
- Subject came into the lab one week later to perform the same protocol after consuming the other drink



Results

Table 1: Mean results for Red Bull and Gatorade on max exercise test performance

	Heart Rate (bpm)	RPE	VO ₂ max (ml/kg/min)	Time of Exercise (min)
Red Bull	189.2 ± 6.6 bpm	17.8 ± 1.5	40.5 ± 10.9	11:40 ± 0.09
Gatorade	189.2 ± 3.3 bpm	18.2 ± 0.7	39.8 ± 7.2	12.09 ± 0.08

- The maximal values of heart rate, RPE, and VO₂max were not significantly different between the 2 different drinks (p > 0.05)
- There was no statistically significant difference between Red Bull and Gatorade for the duration of exercise (p > 0.05)

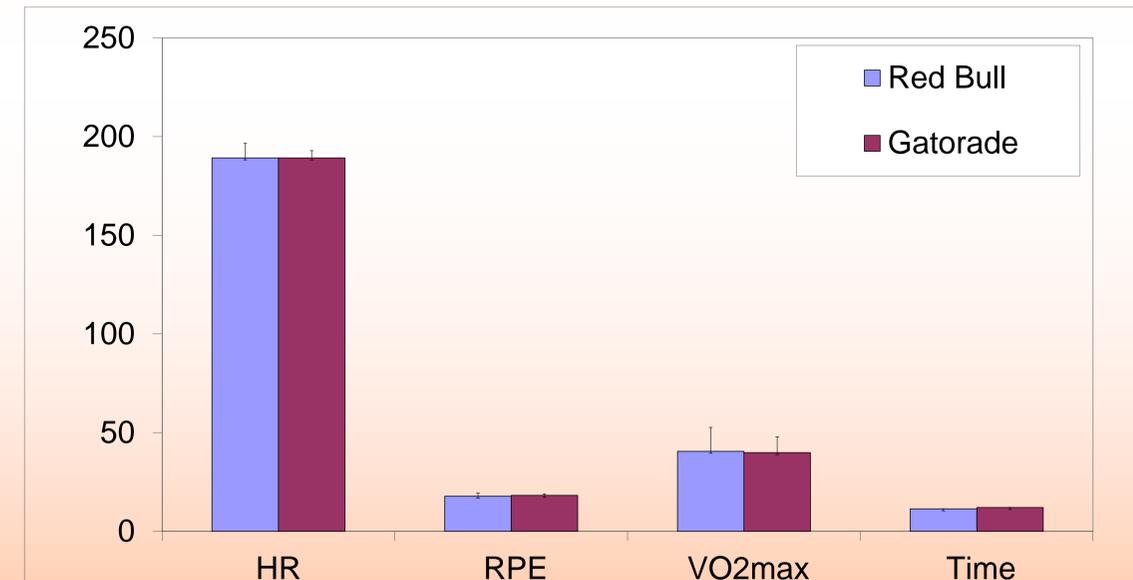


Figure 1: Mean Results For Red Bull And Gatorade

Conclusions

- The results of this study indicate that Red bull and Gatorade have the same effect on max exercise performance
- Neither drink appeared to be more beneficial than the other
- Further studies should be done to gain additional knowledge in this area
 - A larger sample size and an addition of a control group may be good ideas to better future studies