

## ***Effects of Water vs. Gatorade on Athlete Performance***

Exercise Science

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### **Introduction**

There are many factors that influence performance levels. One of these factors is the type of fluid intake in athletes. Water and Gatorade are two popular fluids consumed when performing. During prolonged exercise, athletes generally take in water or sport drinks to help regulate body temperature, their cardiovascular system, and increase performance levels (Coso, 2008). Water also helps athletes maintain a healthy heart rate during exercise, maintain blood volume, stroke volume, and cardiac output (Danielson, 2006).

Since water keeps athletes hydrated, it is most commonly consumed, but since Gatorade contains sugar (glucose) it also gives athletes the energy they need to perform. The glucose is broken down by the muscle cells and converted to ATP (energy). Along with sugar, electrolytes are also nutrients that are critical to maintain exercise intensity. Along with these nutrients, the amount and type of carbohydrates in the sports drink are critical to performance (Singh, 2011). Rehydration is also an important process for athletes in order to recover between sessions and train for longer periods of time (Singh, 2011). During the phase of rehydration after exercise and before the next session, drinking fluids can cause hyperhydration, which helps prevent the onset of dehydration during exercise (Morris, 2015). While water and Gatorade are important in the rehydration process, studies have also shown that sports drinks help reduce fatigue during performance and help athletes maintain a higher level of intensity (Singh, 2011). While previous studies have evaluated the influence of Gatorade and water, on untrained males in the Singh study and all males in the Morris study, this has not been evaluated in the female-only, NCAA DIII athlete population. Therefore, the purpose of this experiment will be to compare the effects of Gatorade versus water during sprinting performance on female collegiate athletes.

### **Methods**

Thirteen-NCAA Division III female athletes participated in this study after reading and signing informed consent documents approved by the LaGrange College Institutional Review Board. Prior to the activity, the athletes were instructed to drink only water or Gatorade throughout the testing day. Athletes in the water group were instructed to consume 12 ounces of fluids by 11:00 am. Athletes in the Gatorade group were instructed to consume 12 ounces of fluids by 11:30 am.

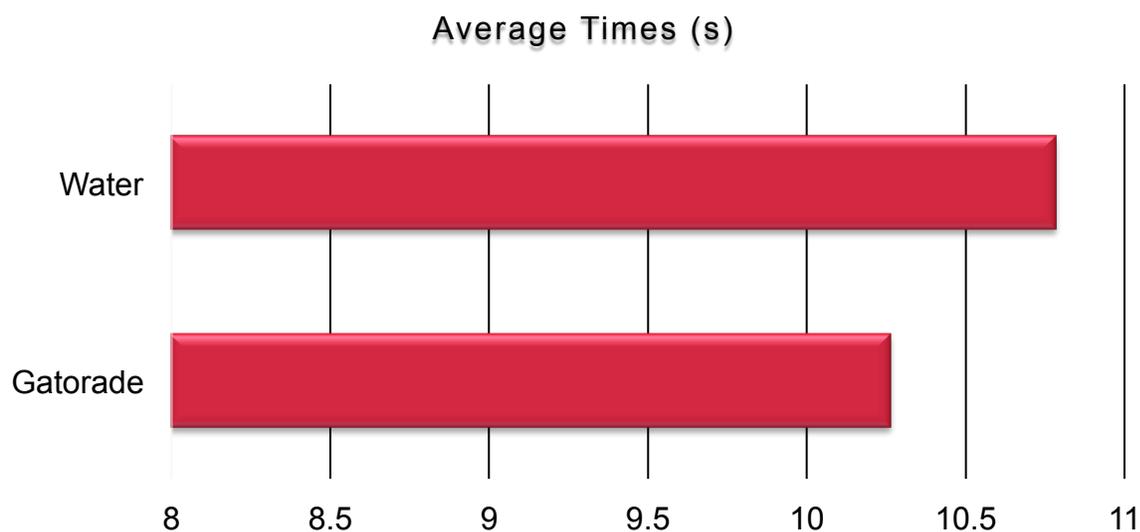
Then the athlete consumed 12 ounces of their specified liquid every hour until testing time, at 5:00 pm for the water group, and 5:30 pm for the Gatorade group. They also performed a standardized one lap and dynamic warm-up that consisted of high knees, butt kicks, power skips, karaoke, and leg kicks forward and backward. After the warm up, the athletes were given 12 ounces of their assigned fluid and consumed approximately half of the 12 ounces. The total time for the warm up period was 10 minutes.

Following the warm-up and resting period, the athletes were lined up on the end line of the LaGrange College soccer field. Experimenters were at mid-field (60 yards away from end line), with stopwatches in hand. After an experimenter reaches zero in a five second countdown, the participants sprinted with their maximum effort to mid-field. The finishing times were recorded, and the athletes were given a 30 second break. Sprints were repeated an additional 9 times, for a total of 10 sprints.

The data collected was analyzed to show the effects of Gatorade and water on division III female athlete's sprinting performance. Before statistical analysis, the trials were averaged for each group. An independent t-test was used to find the statistical difference groups. Cohen's d effect size was used to determine practical difference between groups (Cohen, 1998).

## Results

The *t* test revealed a statistically significant difference between the two groups ( $p = 0.021$ ). The value being less than 0.05 provides evidence of statistical significance for this study. The Cohen's d effect size was .40. This describes a small (.2) to medium (.5) effect size.



## **Discussion**

The purpose of this experiment was to compare the effects of Gatorade versus water on sprinting performance on NCAA Division III female athletes. The results showed a statistical difference between the two groups, with a p-value of .02, which was found using an independent samples t-test. The value of practical difference given from Cohen's d effect size was 0.4. This shows a small to medium practical difference between the two groups. Gatorade presented faster sprint times, which supports the hypothesis that Gatorade will have greater effects on sprinting performance. These results also support the claims of Gatorade as a company.

Gatorade as a company claims that it will "enhance performance" (Ellingwood, 1993). In enhancing performance, Gatorade is able to "fill up the body's tank of blood glucose, which exhausted muscles then can pump for new energy rather than starting to draw down their own precious stored sugar, called glycogen" (Ellingwood, 1993). Gatorade is able to do this in just eight ounces, and participants were drinking 12 ounces every hour and half a bottle after warm up for a total of 78 ounces (Ellingwood, 1993). Water, which contains no glucose, is not able to do this, which causes the muscles to use their stored glycogen as energy. This supports the Gatorade group showing better results on sprinting performance in the present study.

There are multiple variables that were taken into consideration about these results. The type of shoe worn (running shoe or cleats) could have influenced the results, in that some of the participants were slowing down before they reached the finish line so they do not slip on the wet grass. In efforts to improve the study, we would check the conditions of the field in advance, create a control group, and also test more than one day. In testing more than one day, we would have a group drink Gatorade and be tested, and the next time they were tested they would drink water. All of this may improve the consistency of variables in our data.

## **Conclusion**

The results of the study conclude that our participants that consumed Gatorade had faster sprinting times than the participants that consumed water. The results indicate a connection between the consumption of Gatorade and overall greater endurance for athletes. In future training, exercises, and sporting events, coaches and trainers might want to consider the intake of Gatorade before and during the event. The use of Gatorade will allow for better performance in prolonged endurance activities. This study provides justification that it may be beneficial to consider the use of Gatorade instead of water in sports.

## References

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