

Do Sports Drinks Really Work?



Abstract

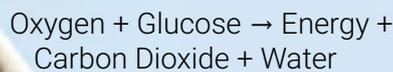
Our investigation's aim was to determine whether a sports drink containing glucose would improve athletes' performance. We took five male students between the ages of 12 to 15 and, with their consent as well as their parents, conducted a test on them over the course of three weeks. We asked them to take one of three different drinks – Lucozade Sport, orange squash and water – then perform an 800m run. Participants were provided with a different drink each week before they performed the test, which happened a total of three times. The experiment showed that Lucozade Sport increased their performance the most, though our study was quite limited.

Funding Statement

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Introduction

When participating in sports, you need to stay hydrated in order to maintain performance levels¹. The more you exercise, the more you respire due to the energy required for the working muscles in the body². The following equation represents what happens during aerobic respiration:



Sports drinks containing glucose have been shown to be useful during endurance training and performances, however it has also been suggested that water hydrates you better in comparison, as you need to drink water to replace the

water lost when exercising³. Some people believe that sports drinks are ineffective, so we were interested in finding out whether this was true or not. The aim of our investigation was to determine the influence of Lucozade Sport, a widely available British sports drink that contains glucose, on performance in an 800m running time trial..

Method

We recruited five male students aged 12 to 15 and collected some of their personal and physical details, alongside consent from their parents. We explained to them what we were doing and how they were going to contribute. Each participant was required to run 800m three times over three weeks, taking a different drink 25 minutes before each run. The three drinks were Lucozade Sport, orange squash and water. The experiment was done on a school 400m running track, during the spring in the late afternoon and the procedure was the same each week. We took the participants' heart rates before and after each test using the method of the participant counting how many beats their heart completed in 6 seconds and multiplying that figure by ten. Once on the school field, we led the participants through a specific warm up including a pulse raiser and stretches. The pulse raiser consisted of jumping jacks and a short 30m jog and was followed by both static and passive stretches. Once the participants had completed the test they performed a cool down activity.

Results

The mean values for all the 5 participants' personal information were as follows:

Gender: Male
Height: 159 cm
Weight: 46 kg
Age: 13.

The participants' mean time for completing the 800m test when drinking Lucozade Sport was **2 minutes 58 seconds**. The mean time when taking orange juice was **3 minutes 9 seconds**. Finally, the mean time when drinking water before the test was **3 minutes 20 seconds**. This result indicates that drinking Lucozade Sport enhanced the participants' performance the most, followed by orange juice and then water. However, using a computer generated system that calculates averages, it seems that this result may not be reliable or significant enough. This supports the idea that sports drinks do not affect exercise performance at this level, though they may be effective for more high intensity long endurance workouts.

INVESTIGATION

The participants' heart rates at the end of the exercises show that they worked at a high intensity. The maximum heart rate for a 13 year old is $220 - 13 = 207$ bpm⁴. The participants' mean heart rate after exercise was 180 bpm, therefore participants were working at 88% of their maximum heart rate.

Limitations of the study

With our project, there were a few limitations. Our main limitation was the number of participants we had. If there had been more participants, the results would be more reliable. This is because a larger sample of participants would have reflected the population in general more accurately. It was very difficult to select individuals due to students wanting to participate in other after school clubs. We could also have randomised the conditions to reduce any learning effect that might have occurred – participants' performance may have been influenced by the fact they knew they were drinking either water, orange squash or a well-known sports drink.

Another limitation discovered was the timings between taking the drinks and completing the run. Sometimes we would have to wait for participants to get changed and walking up to the field and performing the warm-up took time as well. Participants also conducted the testing over three different weeks and the environmental conditions were difficult on each occasion. The temperature and weather conditions varied and this may have affected both the participants' physiological conditions and their motivation. I believe that if we were to repeat the same test over the period of a year with the same participants, we would gain more results on how fitness levels improve with the help of sports drinks.

More research could be done in future to find out the most effective amount of time before exercise to drink sports drinks. In a recent study, University of Kent students found that *post-exercise* heart rate was lowest in the Lucozade Sport category, which we wouldn't have expected. This could be another interesting area of study.

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The group first met together at the Sport Science workshops which took place at the University of Kent. This was the first time the group met and got to know one another. The dynamics of the group consistent of students in various year groups ranging from age 15 to 18 years old. Students had to build a positive relationship quickly in order to achieve their goals for the project. In brief, the project lasted 5 months and involve a series of phases where the group learnt how to: use specialised sports measurement equipment; design a scientific study; collect data and analyse results and produce a scientific poster. The highlight of the project was a student-led presentation evening which took place at the Academy in June 2014, with a Gillingham F.C and leading Sport Scientists.



Figure 2: Giving our presentation.

Conclusion

We found that the participants' performance in the time trial was best when they drank Lucozade Sport, followed by orange squash and then water. However, due to the limitations of our experiment this result may not be reliable. However, there are a lot of options for us to take this study forward and learn whether sports drinks really do what they say on the bottle.

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