

What Sports Drinks have the most Electrolytes?

What Sports Drinks have the most Electrolytes?

Have you ever considered how many electrolytes are in your sports drinks and if they are really beneficial to you? In this experiment I will be testing to see what sports drinks supply the most electrolytes to your body and are the most beneficial for you. I will test this by measuring the resistance in Gatorade, Powerade, Body Armour, Zero Sugar Gatorade, Zero Sugar Powerade, Smart Water, Body Armour water, and Distilled water. In this experiment I have hypothesized that Body Armour will have the most electrolytes because research states that Body Armour has been tested against Powerade and has shown that it has 50% more electrolytes and for Gatorade 30% more electrolytes. This sports drink has many beneficial features such as not using any artificial flavoring or coloring which is much healthier for you and is beneficial to your health. Another perk about this drink is that it is low in calories which is beneficial for you depending on whether or not you are trying to increase or decrease your calorie intake. This is an important topic because many people like to keep up with their electrolytes including me, and some people have trouble knowing what sports drink is the best one to improve your electrolyte intake. Another important reason for this experiment is to know what you are putting in your body and how much of it; your body requires electrolytes to be able to function properly. One more important reason for this topic is for people to be knowledgeable about the amount of electrolytes in the drinks that they buy so that they are not spending their money on drinks that aren't really the best drink out there.

Method

A commonly used method, known as the scientific method, was used to carry out this science project. In this experiment I will test to see what sports drinks supply the most electrolytes to your body and are the most beneficial for you. In this experiment I will be testing Powerade, Gatorade, Body Armour, Zero Sugar Gatorade, Zero Sugar Powerade, Smart Water, and Distilled water as a baseline for all of the drinks. I will test these drinks by measuring the amount of resistance in the drinks with a multimeter to determine which drink has the most electrolytes. I hypothesize that Body Armour will have the most electrolytes because research states that Body Armour has been tested against Powerade and has shown that it has fifty percent more electrolytes and for Gatorade thirty percent more electrolytes. This sports drink has many beneficial features such as not using any artificial flavoring or coloring which is much healthier for you and is beneficial to your health. Another perk about this drink is that it is low in calories which is beneficial for you depending on whether or not you are trying to increase or decrease your calorie intake.

Materials

Many materials were used to complete this experiment. The materials that were used during this experiment consisted of one bottle of blue raspberry Powerade, one bottle of blue raspberry Gatorade, one bottle of blue raspberry Body Armour, one bottle of blue raspberry zero sugar Gatorade, one bottle of blue raspberry zero sugar Powerade, one bottle of Smartwater, one bottle of Body Armour water, one jug of Distilled Water, one Multimeter, two glass bowls, one school provided chrome book, one sharpie, one white sheet of paper to log data, one roll of uninsulated

sixteen gauge copper wire, one plastic straw, one pair of wire cutters, one nine volt battery, one nine volt battery snap connector, 1 roll of paper towels, and three alligator clips.

Procedures

There were many procedures used to conduct this experiment. First, you will need to set out all of your materials. Second, you will need to pour your first drink into the bowl. I filled my bowl up with about six ounces for all of the drinks (just make sure that your conductance sensor is completely submerged). I used a sharpie to mark where I stopped pouring the first drink so that I would have the same amount every time. Third, you will need to fill up another bowl with clean tap water to rinse your straw. You will do this step so that after every trial you can clean the straw and wire, but be sure during this process that you disconnect one of your gator clips and be sure the wires don't touch, if the wires touch this could cause your multimeter to short circuit and blow a fuse. Fourth, you will need to set up your conductance sensor. To do this step, you will need to cut two six inch pieces of uninsulated copper wire, then you will cut a four inch piece of your straw. Once you have these materials ready you will need to wrap your two pieces of wire on each end of the straw making sure the two wires **don't touch**. Fifth, you are going to be setting up your multimeter and nine volt battery. To set up your multimeter you will need to plug one probe into the port labeled "com" and then you will plug in your second probe to the port labeled "v omega". Now you will need to grab your nine volt battery and put on the snap connector. Be careful to remember that the terminals are different sizes and the connector can only fit ONE way. Now you will need to connect your gator clip to the positive wire on the battery and to the positive lead of your multimeter. Now you have a remaining probe which you will connect your other gator clip to and then connect the other end of the clip to one end of your conductance sensor. Now you will have one more gator clip that you will need to connect to the

remaining wire of the snap connector and with the other end of the gator clip you will need to connect it to the remaining wire of your conductance sensor. Sixth, Once you have all of your equipment set up you will be able to test all of the drinks. Be sure to test the drinks the amount of times you are required (I was required ten trials). For your seventh step you will need to log your data after every set of ten trials for each drink. Eighth, you will need to transfer your data into your charts and graphs. For your ninth step you will need to average all of your data and you will have your results for your trials. Now for your tenth and final step you will need to record all your information in your logbook.

Conclusion

In conclusion, the outcome of this experiment showed that Body Armour tested to have the highest amount of electrolytes with an average of 58.08 in resistance.

Results

The results of this experiment were unexpected. In this experiment the results showed that my hypothesis was supported. In this experiment I tested 7 of the most common sports drinks as well as distilled water as a baseline for all of the drinks to see which drink is really the best for you. The results showed that after averaging the 10 trials for each sports drink, that Gatorade had an average of 20.68 mA of resistance and came in 5th place for the most amount of electrolytes, Powerade came in 2nd place with an average of 44.34 mA of resistance, Body Armour came in 1st place with an average of 58.08 mA of resistance, Zero Sugar Gatorade came in 4th place with an average of 32.88 mA in resistance, For 3rd place Zero Sugar Powerade came in with an average of 40.02 mA in resistance, Smart Water came in 7th place with an average of 0.822 mA

in resistance, Distilled water came in 8th place with an average of 0.797 mA in resistance, and Body Armour water came in 6th with an average of 2.2 mA of resistance. For this experiment Body Armour came in 1st and is the best drink for you when trying to supply the most amount of electrolytes to your body.

Discussion

Have you ever wondered if you are really buying the best sports drink for you? Well for my project I will be testing the most common sports drinks and their resistance and I will determine what drink is really the best for you. For this project a man named Joseph tested the amount of electrolytes in Gatorade, Powerade, and Body Armour. Joseph was trying to figure out what sports drink supplied the most electrolytes to help make a more informed decision when buying your drinks. Joseph tested each drink one by one and although Body Armour was tested to have 50% more electrolytes than Powerade and 30% more electrolytes than Gatorade Joseph's results showed that Gatorade is the best sports drink (Joseph, 2022).

Another experiment similar to the one that I have conducted is "Finding Electrolytes in Sports drinks". For this experiment these people tested orange juice, gatorade (or a sports drink of your choice), tap water, and distilled water. They created a sensor using the inside of a pen and some copper wire. They also used a 9 volt battery, a 9 volt battery clip, a digital multimeter, a permanent marker, paper towels, 3 small bowls, masking tape, a ruler, wire cutters, bare copper wire 24 gauge, and alligator clips without wire attached. Their results showed that orange juice

had the highest amount of electrolytes and was the best for you (www.instructables.com, no date).

Much information can be found regarding electrolytes in sports drinks. While researching I came across the website hdph.harvard.edu “Research has shown benefit of sports drinks in adult athletes (though not conclusive as some studies show no benefit), but research in children is lacking.” This is just one of the many facts that I found interesting, (hdph.harvard.edu, no date). According to onlinelibrary.wiley “There is evidence to suggest that exercise-induced dehydration can have a negative impact on exercise performance, and restoration of fluid balance should be achieved after exercise.” This is another fact that I found interesting about dehydration and its effects, (Shirrefs, 2009)

Conclusion and Future Study

In this experiment my hypothesis was supported. One reason that this project was successful was because I was able to determine the problem in the experiment and figure out what sports drink has the most electrolytes. Another reason that this experiment was successful was because there was a clear answer to the question and the question was easily determined. The results in this experiment proved that Body Armour has the most electrolytes and is the most beneficial for you. If I were to do this experiment again I would test a different flavor of drink such as fruit punch or strawberry, to see if flavor affects the amount of electrolytes in the drink. Another thing that I would like to add on to this project would be a larger variety of drinks such as Prime or Vitamin Water.

References

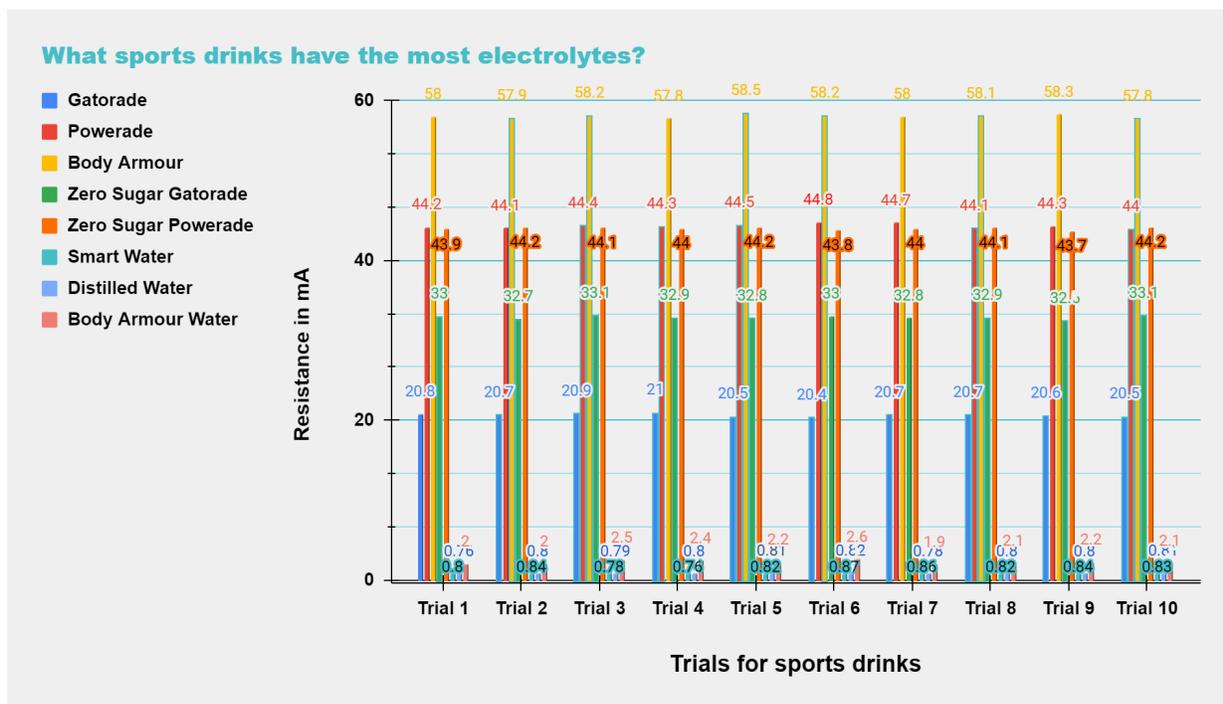
- (2022). *Which Sports Drink Has the Most Electrolytes?*. Homenetmenny.org. Retrieved November 31, 2022, from <https://homenetmenny.org/which-sports-drink-has-the-most>
- Bonvini et al. (2019). *Sports and Energy Drinks: Aspects to Consider*. ScienceDirect.com. Retrieved November 31, 2022, from <https://www.sciencedirect.com>
- Shirrefs, S.M. (2009). Hydration in sport and exercise: water, sports drinks and other drinks . Onlinelibrary.wiley.com. Retrieved November 31, 2022, from <https://onlinelibrary.wiley.com/>

Appendix

Table A1

	Gatorade	Powerade	Body Armour	Zero Sugar Gatorade	Zero Sugar Powerade	Smart Water	Distilled Water	Body Armour Water
Trial 1	20.8 mA	44.2 mA	58.0 mA	33.0 mA	43.9 mA	0.8 mA	0.76 mA	2.0 mA
Trial 2	20.7 mA	44.1 mA	57. mA9	32.7 mA	44.2 mA	0.84 mA	0.8 mA	2.0 mA
Trial 3	20.9 mA	44.4 mA	58.2 mA	33.1 mA	44.1 mA	0.78 mA	0.79 mA	2.5 mA
Trial 4	21.0 mA	44.3 mA	57.8 mA	32.9 mA	44.0 mA	0.76 mA	0.8 mA	2.4 mA
Trial 5	20.5 mA	44.5 mA	58.5 mA	32.8 mA	44.2 mA	0.82 mA	0.81 mA	2.2 mA
Trial 6	20.4 mA	44.8 mA	58.2 mA	33,0 mA	43.8 mA	0.87 mA	0.82 mA	2.6 mA
Trial 7	20.7 mA	44.7 mA	58.0 mA	32.8 mA	44.0 mA	0.86 mA	0.78 mA	1.9 mA
Trial 8	20.7 mA	44.1 mA	58.1 mA	32.9 mA	44.1 mA	0.82 mA	0.8 mA	2.1 mA
Trial 9	20.6 mA	44.3 mA	58.3 mA	32.5 mA	43.7 mA	0.8 mA4	0.8 mA	2.2 mA
Trial 10	20.5 mA	44.0 mA	57.8 mA	33.1 mA	44.2 mA	0.83 mA	0.81 mA	2.1 mA
Average	20.68 mA	44.34 mA	58.08 mA	32.88 mA	40.02 mA	0.822 mA	0.797 mA	2.2 mA

Figure A1



Appendix B

Table B1

	Gatorade	Powerade	Body Armour	Zero Sugar Gatorade	Zero Sugar Powerade	Smart Water	Distilled Water	Body Armour Water
Average	20.68	44.34	58.08	32.88	40.02	0.822	0.797	2.2

Figure B1

