

Effect of Different Foods on Middle School Test Performance

Eliza S. '24, Juliana O. '24, and Jozy L.-H. '24, Marlborough School, Los Angeles CA

Abstract

We chose to research about the influence of food on test taking. Obviously, being hungry teenagers we all eat a lot. We wanted to make sure that the food we were eating did not have a negative effect on our test scores, as we take tests and quizzes almost everyday. We started by doing a little research; studies have shown that junk food has a more negative effect on test scores than healthy food does, but many of these experiments did not include the control variable of no food at all. With adding the factor of no food at all, we asked the question of whether healthy food, junk food, or no food at all has an effect on test scores. We conducted an experiment with three different test taking groups. One group ate fruit before taking the test, one ate junk food before taking it and one ate no food before taking the test. These three different groups of middle school students ate fruit, donuts or no food before taking the same logic puzzle test. These tests were made with logic puzzles in which the level of math of a certain participant did not influence their score on the test. After collecting all the data we can conclude that eating any kind of food before a test benefits a student's score and not eating at all detracts a student's score.

Introduction

Our group decided to do this project to benefit our own test-taking skills in the future. As students, we are expected to take tests to the best of our ability and have done so for many years now. Looking at other sources, there are many different things that you can do to help increase your opportunity for success while taking a test, such as getting a good night's rest, studying in small doses rather than cramming it all into one 5 hour study session, and many more. This information can be found by many sources, such as [the New York Times](#) and more. There have been countless experiments done on how different preparations for test-taking actually affect the scores and productivity level. As Marlborough students, many of us go to Cafe M daily. We all eat food regularly, so we wanted to see if food choice had a certain effect on our school life and test scores. Therefore, we decided to conduct this experiment.

Purpose

The purpose of this project is twofold: to determine whether eating before a test affects grade, and to determine whether or not the type and sugar level of the snack make a difference. We are asking this question because the answer can help us with our test-taking in the future. We will be able to identify if eating a snack before is actually helpful and if we should be aware of what we are eating and when we do so.

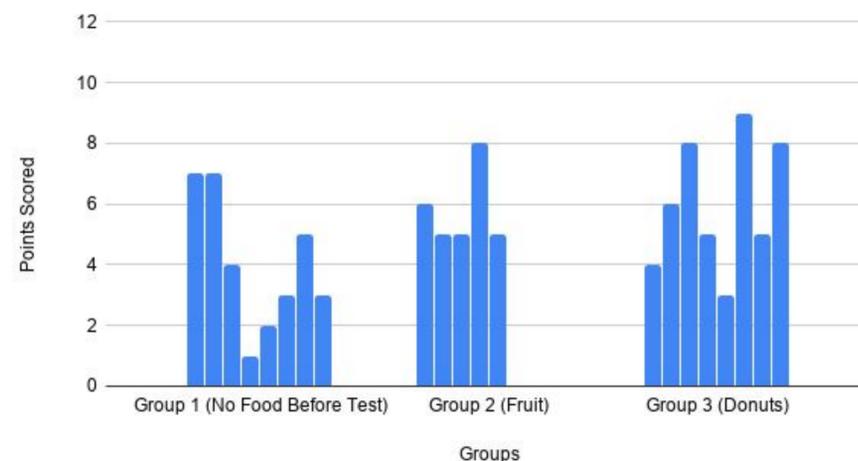
Materials and Methods

To start, we were hoping for 30 participants in total to divide into three different test taking groups. We scheduled three different dates for the participants to sign up for. In total, we got about 22 participants and they divided themselves into different groups depending on one when they were available. After recruiting participants, we started creating a test and found all of the logic puzzles online. In order to receive the best results, we made a test that was not based on prior knowledge so that the test scores did not reflect the level of math someone was in. After creating the test, we decided which date was going to have which kind of food. The first date (group one) did not eat food before the test, the second date (group two) ate fruit before taking the test and the third group (group three) ate donuts and donut holes before taking the test. After conducting all test taking dates, we graded the tests and to make sure the data was accurate we averaged the test scores of each group's test. The materials we needed were a test of riddles and logic puzzles (all of which we found online), a classroom to take the test, one box of 15 donuts, two boxes of donut holes, one fruit platter and participants to take the test.

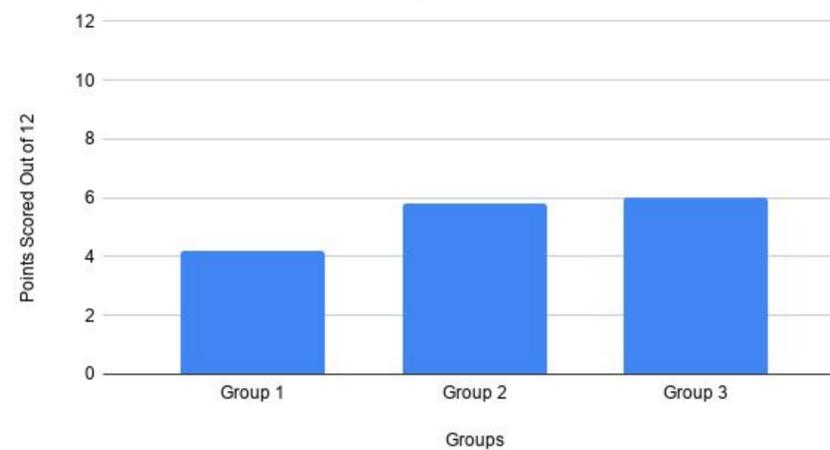
Results

These graphs indicate the scores of the people in the different groups who took the test. Group 1 did not eat anything before the test, Group 2 ate fruit before the test, and Group 3 ate donuts before the test. The first graph displays the scores of each individual in the group; the second graph displays each group's average score. The extreme discrepancies in each of the groups' scores show that this data may not be accurate, one of the problems being that we need more participants for each test. However, the data we gathered indicates that people who do not eat anything do the worst on a test, while people who eat either donuts or fruit score better, with the people who ate donuts gaining a slightly higher score.

Scores on Test out of 12 Possible Points



Average Scores for Each Group



Discussion

Our experiment indicates that students who eat any snack before a test do better than those who don't, with students who ate donuts rather than fruit doing slightly better. Students who did not eat a snack scored an average of 4.2/12, while students who ate fruit scored an average of 5.8/12 and students who ate donuts scored an average of 6/12. We hypothesized that students who ate fruit would do the best, so while our data doesn't exactly reflect that, it does show that it is better to eat food before a test than not to. However, it is our belief that our results may not be entirely accurate, and likely do not reflect food's actual effect on test-taking. Firstly, we were only able to obtain test results from a very small pool of participants. One participant's score could greatly affect the average, so if one person did badly or had seen the logic puzzles before, it could throw off the entire experiment. This problem was augmented by the fact that due to some miscommunications about available Flex Times, we had to change the dates of our data collection multiple times, which made it hard for participants who had previously signed up for one date to commit to attending the new ones. Thus, we had very few participants for each group, which meant that our experiment's results are likely inaccurate. Secondly, the test we had given them had some very difficult problems and some very easy ones. If we had had a more uniform test, one taken from a site instead of compiled of logic problems from a few different places, the test likely would have been easier to grade and would have better indicated the test-taker's capability. Thirdly, due to the time constraints of our testing period, the participants were not given adequate time to digest the food, instead taking the test right after eating it. This meant that only some of our participants would have been actually affected by the consumption of the food. Lastly, we were not able to control if the participants had eaten anything before attending the test-taking period, and so, depending on what they ate for breakfast and if they had eaten a snack earlier, their results may have been influenced. In a repeat experiment, the administrators would have to be sure to be organized. Dates should be solidified, and far more participants should be recruited, and further beforehand. The groups would likely remain the same, with no food, donuts and other sugary snacks, and fruit and other healthy snacks, and it would be observed if one group did better than another due to the different kind of food. The participants should also be given around ten to twenty minutes to digest the food, to ensure that it would have an effect on their results, therefore resulting in a more accurate experiment.

Acknowledgments

Thank you so much to all those who participated in our trial, and took the logic quiz. Your efforts were greatly needed and appreciated. Thank you also to our science teacher; Mr. Guevin, and all other teachers in the science department for helping us with this experiment and permitting us to do it. We thank all parents and everyone involved in food preparations for our project.

Bibliography

- Cooper, Clay. "The Best Foods to Eat Before A Test." *PrepExpert*, 25 Mar. 2019, prepexpert.com/best-foods-to-eat-before-a-test/. Accessed 9 Dec. 2019.
- "Fast-food consumption and educational test scores in the USAc." *EBSCOhost*, 1 Jan. 2013, web.a.ebscohost.com/src_ic/pdfviewer/pdfviewer?vid=3&sid=e389d595-5286-4fb3-a1c5-3f65ac25b7de%40sdc-v-ssmgr01. Accessed 9 Dec. 2019.
- From, n. s. (2006, Mar 17). Board votes to ban junk food in schools: RedEye edition]. *Chicago Tribune* Retrieved from <https://search.proquest.com/docview/420505128?accountid=3672>
- Gewa, C. A., Weiss, R. E., Bwibo, N. O., Whaley, S., Sigman, M., Murphy, S. P., . . . Neumann, C. G. (2009). Dietary micronutrients are associated with higher cognitive function gains among primary school children in rural Kenya. *The British Journal of Nutrition*, 101(9), 1378-87. doi:<http://dx.doi.org/10.1017/S0007114508066804>
- Gorski, M. T., Cohen, J. F. W., Hoffman, J. A., Rosenfeld, L., Chaffee, R., Smith, L., & Rimm, E. B. (2016). Impact of nutrition standards on competitive food quality in Massachusetts middle and high schools. *American Journal of Public Health*, 106(6), 1101-1108. doi:<http://dx.doi.org/10.2105/AJPH.2016.303139>
- Kulkarni, A. A., B. A. Swinburn, and J. Utter. "Associations between Diet Quality and Mental Health in Socially Disadvantaged New Zealand Adolescents." *European Journal of Clinical Nutrition*, vol. 69, no. 1, 2015, pp. 79-83. *ProQuest*, <https://search.proquest.com/docview/1642637133?accountid=3672>, doi:<http://dx.doi.org/10.1038/ejcn.2014.130>.
- McDonald, Katrin. "Food for Thought." *Men's Health*, vol. 16, no. 2, 03, 2001, pp. 78-80. *ProQuest*, <https://search.proquest.com/docview/226869856?accountid=3672>.
- Paul, Annie Murphy. "How to Be a Better Test-Taker." *New York Times* [New York, New York], 13 Apr. 2012, Strategy /coping sec. *New York Times*, www.nytimes.com/2012/04/15/education/edlife/how-to-be-a-better-test-taker.html. Accessed 20 Mar. 2020.
- Smith, Andrew P. "Snacking Habit, Mental Health, and Cognitive Performance." *Current Topics in Nutraceuticals Research*, vol. 9, no. 1, 2011, pp. 47-51. *ProQuest*, <https://search.proquest.com/docview/919439042?accountid=3672>.