Examining the Effects of Sodium Propionate on Heart Rate Using Daphnia magna as a Model Organism

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The increased usage of food preservatives in the American diet over the past decades has led to a greater need to examine their health effects. Of particular concern was the preservative sodium propionate, whose short-chain fatty acid propionate anion has been noted to affect the function and rate of the heart for individuals in some compounds. This experiment examined the effects of sodium propionate on the heart rate, using Daphnia magna as a model organism, to determine whether sodium propionate would significantly increase the heart rate of individuals at larger concentrations. For the experiment, 45 Daphnia magna were procured and separated into four different treatments. The treatments included 0, 0.025, 0.05, 0.075, and 0.10 g/L of sodium propionate, and after successive days, the heart rates of the Daphnia magna were recorded with a compound microscope. The data was analyzed with a Kruskal-Wallis Rank Sums Test. At p=0.2267, the concentration of sodium propionate was found to not have a significant effect on the heart rate of Daphnia magna. While this experiment did not find evidence of sodium propionate significantly affecting heart rate, other preservatives could be found to affect heart rate or other bodily functions. Thus further testing of food preservatives ought to be conducted in the future.

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