## The Effect of Sodium Chloride on Catalase's Breakdown of Hydrogen Peroxide

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Introduction Catalase, an enzyme in aerobic cells, catalyzes the decomposition of hydrogen peroxide (H2O2) into oxygen and water to protect cells from oxidative stress. Decreased catalase activity may lead to high concentrations of H2O2 which can cause oxidative stress on cellular tissue. The role of sodium chloride (NaCI) concentration on the activity of catalase was investigated. It was hypothesized that catalase would breakdown H2O2 slower in a solution containing more saline. Methods Six separate NaCl solutions were prepared: 0.00% NaCL distilled water, 0.94% NaCl, 1.88% NaCl, 3.75% NaCl, 7.5% NaCl, and 15% NaCl. Catalase was then added to each solution. A vernier oxygen sensor measured oxygen produced over a period of fifteen minutes. Three trials of the six concentrations were performed. Data was analyzed using a one-way ANOVA with Holm-Sidak's multiple comparison test. Results The concentration of NaCl was found to significantly effect the activity of catalase (p<0.0001). The significant decrease in catalase activity was noted when 0.00% NaCl was compared with 1.88% NaCl. The average data between the 3 experiments was: 0.00% saline solution produced 9.86% oxygen, 0.94% produced 6.25% oxygen, 1.88% produced 4.43% oxygen, 3.75% produced 3.21% oxygen, 7.50% produced 1.65% oxygen, and 15.00% produced 1.23% oxygen. Conclusion The concentration of NaCl was found to significantly effect to activity. Significant decrease in distilled water and trials of 1.88% saline and greater. Comparison of 0.94% saline solution showed significance to saline concentrations of 7.5% and 15.0%. All saline concentrations trended towards less catalase activity.