Comparative Study of the Effects of a Non-Nutritive Sucralose Sweetener and Ordinary Cane Sugar on Lactobacillus

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Sucralose is a non-nutritive sweetener heavily marketed in commercial foods and beverages which is mixed with maltodextrin and widely distributed a well know sugar substitute. Sucralose is manufactured by the chlorination of sucrose (sugar) by replacing three hydoxyl molecules with chlorine atoms. When ingested sucralose has a taste 600 times sweeter than sucrose yet provides zero calories. The aim of this study is to examine and compare the effects of this sugar substitute on lactobacillus probiotic powder in liquid media in a direct comparison to sucrose. The research started with a purchased bottle of probiotic powder with a stated bottle value of 50 billion CFU/gram of various strains of lactobacillus. A vial of thioglycollate broth in a 9mL screw top tube was inoculated with 0.5g of the lactobacillus powder. The broth tube was allowed to incubate at 37°C for 48 hours. At 48 hours 12 broth tubes were inoculated with bacteria and measured amounts of sucrose (tubes 2-7) and the sugar substitute (tubes 8-13) and incubated at 37°C. Chemical analysis and colony count methods were conducted at 5, 10, 20, and 30 days of incubation. The results of this study show diminished bacterial activity in terms of colony counts and chemical analysis in the broth tubes containing the sugar substitute compared to the tubes containing sucrose. The results of this study suggest that this sugar substitute has some bacteriostatic qualities by the measured chemistries and colony counts taking into account the existing glucose present in the broth available for metabolism. Further research is warranted to clear conflicting evidence exists in the scientific community regarding the residual health effects of non-nutritive sweetener consumption.

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