

The Effects of Prebiotics and Probiotics on the Growth and Antibiotic Resistance of *Escherichia coli*

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As antibiotic resistance increases to 70% by 2050, science is looking for new solutions to bacterial infections. As presented recently, the balance of bacteria in the microflora is a prevention method for intestinal tract infections and diseases. A new field of interest, the use of probiotics as a treatment, has arisen. In this study, the inefficacy of Penicillin G was highly suggested because it had no zone of inhibition against *Escherichia coli*. Also, *Alcaligenes faecalis*, *Lactobacillus acidophilus*, *Lactobacillus bulgaricus*, and *Lactobacillus casei* were investigated to inhibit and compete with *Escherichia coli*. The probiotics were able to significantly inhibit the growth of *Escherichia coli*, which is of concern because an unhealthy gut suffering from Leaky Gut Syndrome (LGS) is susceptible to the passage of *Escherichia coli* from the gut to the bloodstream. Prebiotics, indigestible carbohydrates that can be fermented by probiotics for energy, were combined with the aforementioned probiotics to examine inhibition of *Escherichia coli*. The addition of prebiotics significantly increased the inhibition of *Escherichia coli*. In sum this project highly suggests the efficacy of probiotics and more specifically those enhanced with prebiotics against *Escherichia coli*, a possibly harmful bacteria of the gut flora, when compared to the inefficacy of antibiotics.