

Bacterial Acoustic: Investigating the Impact of White Noise on the Growth of *E. coli*

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This research project investigates the influence of white noise frequencies on the growth of *E. coli* bacteria within the audible range of 14,500-15,000 Hertz (Hz). White noise, characterized by uniform intensity across all frequencies between 20-20,000 Hz, is known to mask disruptive environmental sounds. However, its potential impact on biological systems, particularly bacterial growth, remains an unexplored area. The experimental procedures involved the construction of a soundproof foam box housing a Bluetooth speaker. *E. coli* K12 bacterial dilution was prepared using a 0.9 saline solution, following the 0.5 McFarland standard. Colonies of *E. coli* were combined with 2 mL of saline solution, and 20 micro-liters of the resulting bacterial dilution were plated onto Mueller-Hinton agar. The agar plates with microorganisms were placed inside the soundproof box and exposed to white noise frequencies for 20 minutes and 24 hours at 37°C in an incubator. The results, quantified and analyzed using the ImageJ program, revealed a negative correlation between white noise frequency and *E. coli* growth inhibition. The higher the white sound frequency the lower the number of *E. coli* colonies. These findings contribute to the understanding of the impact of sound frequencies on microbial growth, opening avenues for further exploration in the fields of environmental microbiology and noise pollution studies.