

LISA WANG



Evaluating Probiotic Viability of Manufacturer Claims

Lisa Wang



Introduction:

Probiotics are live microorganisms sold as a supplement intended to have health benefits when colonized in the colon. The United States Food and Drug Administration (FDA) does not regulate these products. Without FDA approval, research on probiotic safety and adverse event monitoring does not occur before being released for public consumption. The only credibility of these products is from the manufacturing labels. Garden of Life: Women's Daily Care, an over-the-counter probiotic, is used to investigate manufacturer claims. The choice of probiotic is due to the claim of 40 billion colony-forming units (CFU), the number of viable probiotics.

Results: Figure 1. (below) A serial dilution of viable cells plated 10^{-2} , 10^{-3} , 10^{-4} , 10^{-5} , and 10^{-6} , labeled A-E, and incubated at 37°C , 5% CO_2 for 48 hours.

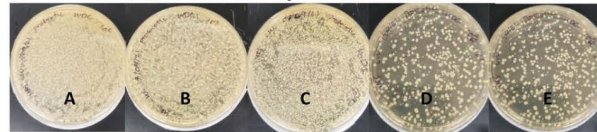


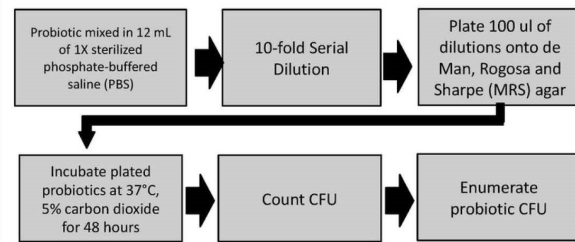
Figure 2. (below) D.F. and CFU data from serial dilution.

Dilution Factor (D.F.)	CFU
10^{-5}	1880
10^{-6}	761

CFU per mL	Average CFU per mL	Total CFU	Average Total CFU
1.8×10^9	4.7×10^9	2.2×10^{10}	5.6×10^{10}
4.7×10^9		9.1×10^{10}	

Figure 3. (above) Results calculated from figure 2. Data using the formulas: $\text{CFU per mL} = (\text{CFU} \times \text{D.F.}) \div (\text{plated mL})$. $\text{Total CFU} = (\text{CFU per mL}) \times (\text{mL of stock solution})$.

Method:



Conclusions:

The Garden of Life: Women's Daily Care have 140 billion more CFU than claimed. Although the probiotics survive through this experiment, *in vivo*, the probiotics have to survive past the stomach acid to colonize inside the colon. Due to time constraints, this experiment had a sample size of one and should be replicated with a larger sample size in addition with other probiotic brands. To conduct further analysis of this research, simulated gastric fluid and intestinal fluids can mimic stomach conditions. Simulated stomach conditions will give a more accurate result to test probiotic viability after oral consumption.

Acknowledgments:

Special thanks to Dr. Marianne Smith, Sofia Rivera, Manjula Gunawardana, Paul Webster, Citrus College, Oak Crest Institute of Science, and the United States Department of Education. The United States Department of Education funds this research Award P031C160152.



The United States Food and Drug Administration does not regulate probiotics. The only credibility of these products is from the manufacture labels. Over the summer, I evaluated these claims with the use of an over-the-counter probiotic.

Alternate Text:

Lisa Wang

Quote: "The United States Food and Drug Administration does not regulate probiotics. The only credibility of these products is from the manufacture labels. Over the summer, I evaluated these claims with the use of an over-the-counter probiotic. "

Image of Lisa Wang

Image of text and graphic laden project presentation entitled "Evaluating Probiotic Viability of Manufacturer Claims. Lisa Wang."