

Microbiology analysis essay



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The increase in water inside the cell causes the cell to become engorged and erupt. In a hypertonic environment, water will leave the cell, as the amount of water in the cell is higher than that outside of the cell. As a cell loses water in a hypertonic environment it becomes smaller in size and withers. Isotonic environments are preferred by most microbes for the most advantageous growth, although some live in slightly hypotonic solutions. (Alonzo, 2008) Growth in NaCl Solutions Samples of *S. cerevisiae* and *S. pidermidis* were placed into sodium chloride (NaCl) solutions of 1, 7 and 15 percent which were supplied in the lab kit. The *S. cerevisiae* results are as follows.

After 24 hours of observation there was a moderate amount of growth in the 1% NaCl solution which had a cloudy overall appearance and the growth appeared to be even throughout the specimen. There was minimal growth in the 7% NaCl solution and most of that growth was adhering to the sidewall of the tube. No growth was observed in the 15% NaCl solution. The results of the *S. pidermidis* specimens were very similar to those of *S. cerevisiae*. In the 1% NaCl solution a large amount of growth was noted. This specimen was not as cloudy as that of the *S. cerevisiae* but growth was consistent throughout the tube. Moderate growth was noted in the 7% NaCl solution. Again, no growth was noted in the 15% NaCl solution. Results Most microbes like to have an isotonic or slightly hypotonic environment to support optimal growth. The water activity also plays a big role in the microbes ability to survive as most cannot grow in a water activity level less than 0. 1. Based on observations and construction of a data table, it was shown that the 1% NaCl solution had a water activity level of 0. 99, the 7% NaCl solution 0. 96 and

the 15% NaCl solution 0.91. Based on the table it was expected that there would be no growth in the 15% NaCl solution as most microbes cannot survive at a water activity level of 0.91. In the *S. cerevisiae* specimen, moderate growth was expected and observed based on the knowledge that most microbes desire this type of environment for growth.

The same was expected although a larger amount of growth was observed for the *S. epidermidis* specimens in the 1% NaCl solution than expected. The 1% NaCl solution provided the best environment for the growth of both microbes. Minimal growth of *S. cerevisiae* and moderate growth of *S. epidermidis* was observed from the 7% NaCl solutions. The *S. epidermidis* is used to a slightly salty environment on the surface of skin which may account for the higher growth over *S. cerevisiae* in this environment.

Lastly, no growth was noted in either specimen of 15% NaCl. This type of environment does not support the growth of most microbes due to the increase in salt content and the hypertonic environment it creates. Sucrose Solution/Results Sucrose was not included in the lab kit and I was therefore unable to perform and report results from this experiment. References Alonzo, C. 2008. A Laboratory Manual of Small-Scale Experiments for Independent Study of Microbiology. Englewood, CO, US: Hands-On Labs, Inc. OSMOSIS