Effect of Creatin on The Growth of Yeast Cells

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Abstract

We did a research to compare how different amounts of creatine affected the rate of growth for the same kind of yeast. We used the hemocytometer method where we put three different solutions under a microscope and counted the alive cells. We found that over time the yeast cell count went up, which supported our hypothesis stating that if we give yeast more creatine it will grow faster. The importance was to see how creatine affects cells.

Introduction

Throughout the fitness community Creatine has boomed in popularity to increase performance. Creatine has been shown to help your muscles build more energy during heavy lifting or high intensity exercises (Mawer, 2018). However, how does this take place in our cells? To get a better idea of how Creatine affects live cells, we experimented with live yeast cells and observed how the Creatine influenced the yeasts growth.

This experiment aims to verify if creatine can enhance the growth rate of yeast. This research is significant because it provides insight into the yeast's growth under different nutrient conditions. Understanding these interactions can have practical applications in industries like food production and biotechnology, where yeast plays a crucial role in various processes (Patel et al., 2022).

Methods

Materials & Location

For our research, we used an incubator, methylene blue, hemocytometers, transfer pipettes, pipettes, microscopes, a counter, test tubes, and 3 yeast-creatine solutions (80mL 0.5%, 1.0%, 2.0% creatine-water solutions mixed with 10mL of baker's yeast solution [1mL yeast+50mL water]).

Procedure

At week 1, we made the baker's yeast solution (1mL yeast+50mL water). In a test tube, we mixed 1mL of yeast solution with 9mL of methylene blue and added this mixture to a hemocytometer. Each of us counted the cells in this solution, and we took the average and calculated the amount of living cells in the solution.

For weeks 2 and 3, we repeated the process: we added methylene blue to the yeast creatine mixtures, then placed the mixtures under the microscope, and counted the live cells in the same way to track any changes in cell viability and growth over time.

Average Alive Cell Count Throughout 3 Weeks Based On Creatine Solution.

Creatine Solution	0.5%	1.0%	2.0%
Week 1: Avg Cell Count	4,950,000	4,950,000	4,950,000
Week 2: Avg Cell Count	9,725,000	10,025,000	11,125,000
Week 3: Avg Cell Count	12,725,000	9,125,000	6,575,000

Table 1. Alive Cell Count Based on different Creatine Soultions

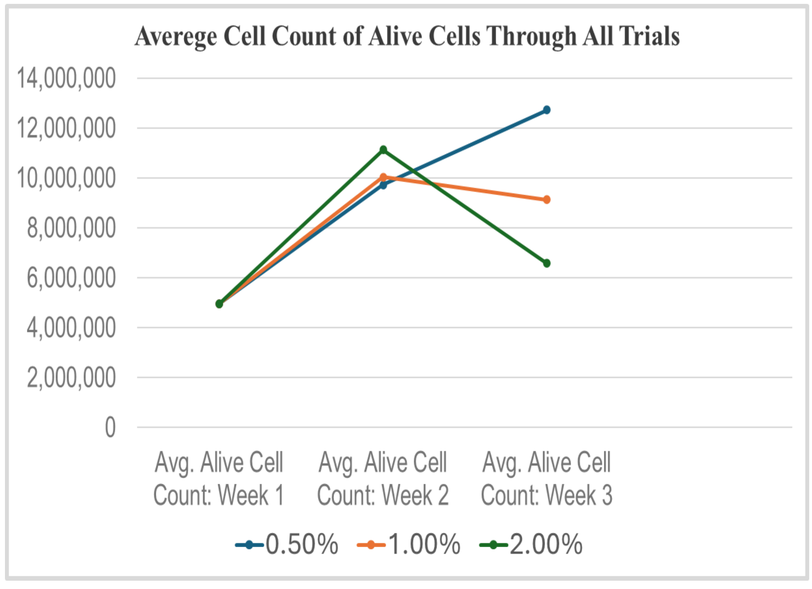

Figure 2. Shown is the average alive cell count over week 1, week 2 and week 3

Discussion

Our study demonstrated that increasing the concentration of creatin in yeast solutions positively affected yeast growth rates, as evidenced by the higher yeast cell counts over time in solution with higher creatin concentrations. These findings support our origin hypothesis that if yeast is given more creatine, it will grow faster. The data from our hemocytometer counts consistently showed an upward trend in yeast cell numbers as creatine concentrations increased from 0.5% to 2.0%, indicating that creatine supplementation may play a role in enhancing yeast metabolism or growth processes.

Since we observed the container with the most creatin experiencing the largest amount of cell growth, this finding is consistent with how creatin affects our own cells. We know that creatin affects our own bodies by increasing its ability to produce ATP and thus improves our muscle mass and strength (Mawer, 2018). Therefore, the creatin must be increasing the yeasts developmental process, possibly by increasing its ATP output.

You might have noticed the considerable degrease in creatin cells by the 1% and 2% solutions during week 3. Unfortunately, this was caused by the lids of the flasks being put on too tight, prohibiting the flow of oxygen into the flask which essentially killed much of the yeast. If the lids were put on correctly, we are entirely sure that the number of yeast cells would have risen again.

Overall, our findings provide valuable insights into how creatine supplementation affects yeast growth, which may have implications for biotechnological applications such as fermentation or biofuel production. Future research could explore the underlying biochemical mechanisms of creatine's effects on yeast, assess its influence on different yeast species, or evaluate the long-term impacts of creatine on yeast populations. These studies could help refine our understanding of creatine's role in microbial growth and contribute to optimizing its use in industrial processes.

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