

Osmosis Egg Lab Report

OBJECTIVE OF THE EXPERIMENT

The experiment is aimed at giving a better understanding of osmosis process and the different experiment conditions under which osmosis occurs.

INTRODUCTION

Osmosis is a process whereby water or any fluid moves from the area of less concentration of dissolved particles to a region of high concentration of dissolved particles across a semi-permeable membrane. Due to difference in the concentration gradient, dissolved particles are able to move across a semi-permeable membrane from the area of high concentration to that of low concentration. To study the shifting of water across a membrane, in this experiment we will examine a demineralized egg. Immersing the eggs in vinegar for 2-4 days will dissolve egg shells thereby leaving a fragile, thin, semi-permeable covering similar to that of a human body cell (Magloire 227).

Basically, we have three different types of concentrated solutions. A hypertonic solution is the one where liquefied particle concentration is greater than that of human cells and therefore water moves out of body cell. For a hypotonic solution, water shifts into body cell since the solution of liquefied particles is less concentrated as compared to those of body cells. Finally, we have an isotonic solution where the concentration of body cells is the same as that of liquefied particles in a solution and consequently no flow of water across the membrane is observed (Magloire 228).

EXPERIMENTAL PROCEDURE

Three eggs were put in vinegar and left there for three days. Three days after, a demineralized egg was removed from vinegar and cleaned using tap water. The mass of the cup to use in the experiment was recorded. The cleaned egg was carefully put into the clean cup and weighted. The mass of the egg itself was calculated and recorded. The cup was then filled with three-quarters of distilled water, which is a hypotonic solution, and left for 40 minutes. 40 minutes later, the water was carefully poured out and the weight of the egg with the cup was determined.

Next, a clean cup with an egg was filled with corn syrup (hypertonic solution) until the egg was completely covered and left for 40 minutes. Again, the solution was carefully poured out and the weight of the cup with the egg in it was determined and recorded.

RESULTS

	Width (cm)	Length (cm)	Mass (grams)	Quantitative Data
An original egg before soaking	12	16	53.3	The egg is white in color, the texture is smooth, has no smell.
The egg after soaking in vinegar	15	18.5	69.9	The egg is white in color, smells like vinegar, feels smooth, and has a lot of foam around its shell.
The egg after soaking in corn syrup	12	16	47.5	The egg is white in color, the shell is thin, smells like sugar and feels squishy or spongy.

The egg after soaking in distilled water	14	18	69.9	The egg is transparent with some yellow showings, no smell, the egg is swollen and shows signs of disintegration. Texture is squishy and wet.
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DISCUSSION

The results of the experiment show the increased mass of the egg being soaked in vinegar. This is explained by the fact that vinegar has a higher concentration of water as compared to the egg and therefore through osmosis water moved from highly concentrated area (vinegar) into the egg which has lower concentration of water molecules. This made the egg increase in its weight from 53.3g to 69.9g, in length from 16cm to 18.5cm, and width from 12cm to 15cm.

On the other hand, we discovered that corn syrup is less concentrated with water molecules and therefore through osmosis water molecules moved across the membrane from the egg into corn syrup thereby leading to decrease in weight and size of the egg which is obvious from the table. Finally, when the egg is immersed in distilled water, there is an increase in the size and the weight of the egg. This is a clear indication that through osmosis water molecules moved from highly concentrated area into the egg which was less concentrated in terms of water molecules.

CONCLUSION

Water molecules shifted from the area of high gradient to the area of less gradient. For example, when the egg was placed in corn syrup, water moved out of egg thereby reducing the weight of the egg. The reverse is true for distilled water. In

conclusion, the objective of the experiment was met since the process of osmosis was examined.

QUESTIONS

1. *What are some potential sources for errors in the experiment? What can be done to minimize those?* An error might have occurred due to incorrect measurements of the size and weight of the egg. Recording wrong measurements may lead to false reflection of what happened in the course of the experiment. The second error could have occurred if the egg were not carefully handled which could have led to breakage. Once the egg has a crack, water or liquid molecules will flow across, it will lead to either smaller or bigger weight and size of the egg which causes a false reflection of what happened. To minimize the above said errors, the egg should be handled with care and flexible measuring gadgets should be used to get accurate data.

2. *Based on this lab, what would you expect to happen to the cells of a celery stick if you placed it in a hypertonic solution and why?* We expect the cells of a celery stick to be deprived off water since water molecules will shift from the cells which is less concentrated into the hypertonic solution.

3. *Dishonest shellfish dealers actually place their oysters and clams in a hypotonic solution. Why?* This happens because they want their oysters and clams to weigh more than they actually do. The thing is that when placed in hypotonic solution, due to osmosis, water moves into the fish making it heavier since.

Works Cited

Magloire, Kim. *Cracking AP Biology Exam*. New York: Random House, 2004.