

## Lab Report: Osmosis in Potato Tissue

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### **Abstract**

This experiment investigated osmosis by measuring mass changes in potato strips placed in solutions of different solute concentrations. The results demonstrate that water moves from regions of higher water concentration to regions of lower water concentration across a semipermeable membrane. Potato samples gained mass in distilled water and lost mass in concentrated salt solutions, confirming the principles of osmotic movement.

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## Introduction

Osmosis is the movement of water across a semipermeable membrane from an area of higher concentration of water to an area of lower water concentration. In biological systems, this occurs across the cell membrane and plays a critical role in maintaining cellular balance. When plant tissues such as potatoes are placed in solutions with different solute concentrations, water moves into or out of the cells depending on the surrounding environment.

According to Campbell et al. (2018), osmotic movement occurs when water flows toward regions with higher solute concentration, resulting in measurable physical changes in plant tissues. This experiment demonstrates osmotic behavior using potato strips as a model system.

## Objectives

- To observe osmosis in plant cells using potato tissue.
- To measure mass changes resulting from water movement across cell membranes.
- To determine how solute concentration affects osmotic water movement.

## Materials

- Fresh potato
- Knife and ruler
- Salt solutions (0%, 5%, 10%, 15%)
- Distilled water
- Digital balance

- Beakers

- Paper towels

### Methodology

1. Potato strips of equal size were prepared.
2. Each strip was weighed to determine its initial mass.
3. The strips were placed into four different solutions with varying salt concentrations.
4. After 60 minutes, the potato strips were removed and gently dried.
5. The final mass of each strip was measured.
6. The percentage change in mass was calculated.

### Results

Solution	Initial Mass (g)	Final Mass (g)	Mass Change (g)	Percent Change (%)
Distilled Water (0%)	5.0	6.2	1.2	24.0
5% NaCl	5.0	5.3	0.3	6.0
10% NaCl	5.0	4.6	-0.4	-8.0
15% NaCl	5.0	4.1	-0.9	-18.0

Table 1: Mass changes of potato strips in different salt concentrations.

## Graphical Representation

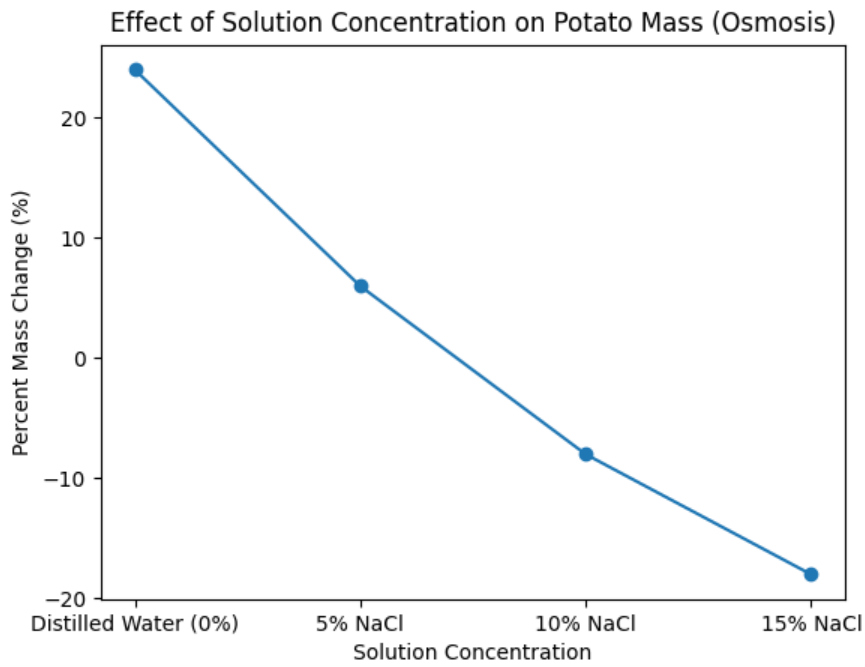


Figure 1: Graph showing percentage mass change in potato strips across solution concentrations.

## Osmosis Diagram

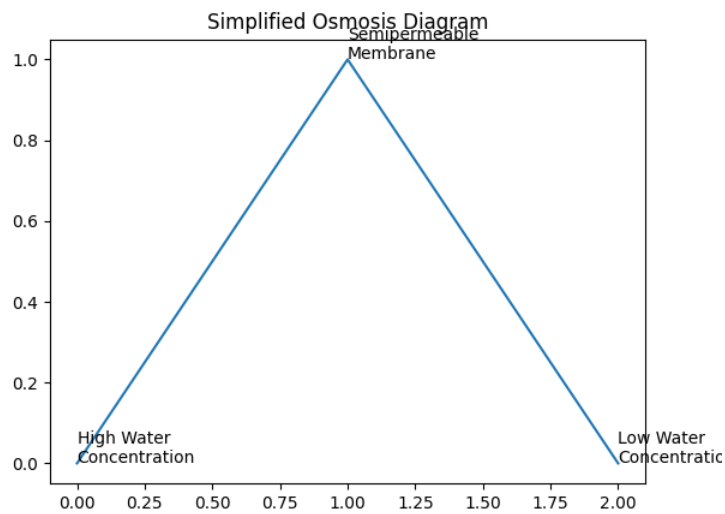


Figure 2: Simplified diagram illustrating water movement across a semipermeable membrane.

### **Discussion**

The results demonstrate that potato strips placed in distilled water gained mass, indicating that water moved into the cells because the surrounding environment had a higher concentration of water. Conversely, potato strips placed in concentrated salt solutions lost mass because the external environment had lower water concentration. As a result, water moved out of the cells.

This observation supports the principle that water moves across a semipermeable membrane from regions of higher water concentration to regions of lower water concentration. The potato cell membrane allowed water movement but restricted the movement of solute particles, making the tissue an effective model for studying osmosis.

### **Conclusion**

The experiment successfully demonstrated osmosis in plant tissue. Potato strips gained or lost mass depending on the solute concentration of the surrounding solution. These results confirm that water movement across cell membranes follows osmotic principles and plays a vital role in maintaining cellular balance in biological systems.

## References

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