Life Sciences 11 An Eggcellent Experiment Eggsperimenter:

**Purpose:**

*Practice scientific method See osmosis in action*

*Collect accurate data*

**Problem:** Which liquid would be the best to replenish your cells with water post-workout (after exercise)?

**Hypothesis: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**Materials:**

5 eggs

 5 beakers or cups

Vinegar

 Gatorade

Saline solution (salt water)

Corn Syrup

 Tap Water

Spoon

Distilled water

Milk

Pop

Scale

**Method:**

1. Weigh each egg and record data in the Pre-Experiment Egg column and on the cup.
2. Place each egg into a beaker and cover with vinegar. Soak all 5 eggs in vinegar overnight.
3. *VERY DELICATELY* drain the vinegar from each egg and record any changes (weight, colour, *etc*.) in the 'After Soaking in vinegar column'.
4. Replace the vinegar with equal amounts of solutions of your choice so each egg is covered.
5. Wait overnight and record any changes seen in the eggs in the appropriate column.

Observations Chart:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pre- Experiment Egg** | **After Soaking in Vinegar**  | **After Soaking in \_\_\_\_\_\_\_\_\_\_\_** | **After Soaking in \_\_\_\_\_\_\_\_\_\_\_** | **After Soaking in \_\_\_\_\_\_\_\_\_\_\_\_** | **After Soaking in \_\_\_\_\_\_\_\_\_\_\_\_\_** | **After Soaking in \_\_\_\_\_\_\_\_\_\_** |
| **1****Mass:** |  |  |  |  |  |  |
| **2****Mass:** |  |  |  |  |  |  |
| **3****Mass:** |  |  |  |  |  |  |
| **4****Mass:** |  |  |  |  |  |  |
| **5****Mass:** |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Egg** | **Solution** **(Test Liquid)** | **Initial Mass****Mass Before Soaking in Test Liquid (*after* vinegar)**  | **Final Mass****Mass After Soaking in Test Liquid** | **Change in Mass****(Final – Initial)** | **% Change in Mass**$(\frac{Change}{Initial})$ **x 100 %** | **Was this solution *hypertonic*, *hypotonic*, or *isotonic* compared to the egg?** |
| **1** |  |  |  |  |  |  |
| **2** |  |  |  |  |  |  |
| **3** |  |  |  |  |  |  |
| **4** |  |  |  |  |  |  |
| **5** |  |  |  |  |  |  |

**Analysis: (Answer in COMPLETE sentence!)**

1. What is your independent variable in this experiment? **How do you know?**
2. What is your dependent variable in this experiment? **How do you know?**
3. What controls did you use in this experiment?
4. Why did we have to pre-soak the eggs in vinegar before testing the post-workout drinks?
5. What does the egg represent in this experiment?
6. Why did we use the percent change in mass instead of just using the change in mass?
7. Describe the changes that you observed in **each** egg. Include the solution it was placed in, the % change in mass, changes in appearance/texture, whether the solution was hyper/hypo/isotonic and an *explanation of how you know*.

|  |
| --- |
| Egg 1: |
| Egg 2: |
| Egg 3: |
| Egg 4: |
| Egg 5: |

1. Choose one egg that was placed in a *hypertonic solution*. **Explain** **why** the changes you observed happened. Include a **labeled drawing** to help with your explanation. Important terms to include: **solute concentration (in both the egg and the solution)**, **water concentration (in both the egg and the solution), semi-permeable membrane, and** **water movement down concentration gradient**.

1. Choose one egg that was placed in a *hyptonic solution*. **Explain** **why** the changes you observed happened. Include a **labeled drawing** to help with your explanation. Important terms to include: **solute concentration (in both the egg and the solution)**, **water concentration (in both the egg and the solution), semi-permeable membrane, and** **water movement down concentration gradient**.

**Conclusion:** Was your hypothesis correct? *Based on your results from the Eggcellent Experiment*, justify your answer to the *problem*.