

Dec 31, 2021

Observations

Preparations for Experiments

- 8 potatoes in 4 groups
- 4 large ones
- 4 small ones
- 1 large + 1 small in each group

4 groups for experiments

- Normal
- Frozen \rightarrow thawed
- Steamed
- Dehydrated

1. Normal (Raw)

Weight: small potato = 34g, large potato = 212g

Observations

- Multiple experiments conducted for each potato
- Used same materials (Metal electrodes, Multimeter, Alligator clips, wires, ruler and scale)
- Voltage varies, not constant on the multimeter
- weight is constant (doesn't change after experiments are conducted)
- Distance between electrodes on potato is consistent
- Depth of electrodes inserted in potato is consistent
- Voltage is similar between experiments for each potato
- Voltage of large potato $>$ small potato's voltage
- larger difference between the average of currents
- Current of large potato higher than small potato's current

Results for large potato, normal status

	Voltage	Current
Experiment 1	1.436V	461µA
Experiment 2	1.491V	465µA
Experiment 3	1.452V	445µA

Results for small potato, normal status

	Voltage	Current
Experiment 1	1.376V	342µA
Experiment 2	1.368V	365µA
Experiment 3	1.340V	357µA

2. Frozen → Thawed

Weight: small = 34g, large = 190g

Observations

- Frozen at -18°C for 3hrs, then thawed in 21°C for 3hrs
- Multiple experiments conducted for each potato
- Used the same materials
- Weight is constant (absent change after experiments are conducted)
- In thawing process, slight difference in weight (1gram)
- Distance of electrodes inserted between potato is the same
- Voltage varies, not constant on multimeter
- Voltage is similar between experiments for each potato
- Depth of electrodes in potatoes is consistent
- Large potato has a higher voltage and current than small potato

Results for large potato (Frozen-Thawed)

	Voltage	Current
Experiment 1	1.542V	413 mA
Experiment 2	1.467V	427 mA
Experiment 3	1.466V	409 mA

Results for small potato (Frozen-Thawed)

	Voltage	Current
Experiment 1	1.408 V	391 mA
Experiment 2	1.404 V	391 mA
Experiment 3	1.394 V	374 mA

3. Steamed

Weight: small = 34g, large = 206g

Observations

- Steamed for 45 minutes
- Multiple experiments conducted for each potato
- Used same materials for experiments
- Weight changed after steaming: small = 33g, large = 205g
- Weight doesn't change after experiments are conducted
- Distance of electrodes inserted in potato is the same
- Depth of electrode in potato is the same
- Voltage varies, not constant on the multimeter for each experiment
- Voltage and current of large potato > those of small potato
- Both voltage and current in group 3 are higher than in groups 1 and 2

Results for large potato (steamed)

	voltage	current
Experiment 1	1.584V	2132 μ A
Experiment 2	1.562V	2215 μ A
Experiment 3	1.557V	2182 μ A

Results for small potato (steamed)

	voltage	current
Experiment 1	1.561V	1480 μ A
Experiment 2	1.524V	1939 μ A
Experiment 3	1.526V	1911 μ A

4. Dehydrated

Weight: small = 30g, large = 194g

Observations

- Dehydrated in air fryer for 4 hours at 195°F
- Weight change: small = 22g, large = 148g
- Multiple experiments conducted for each potato
- Used the same materials for each experiment
- Weight doesn't change after conducting experiments
- Distance of the electrodes inserted in potato is the same
- Depth of the electrodes in the potato is the same
- Voltage varies, not constant on the multimeter
- Voltage is similar between experiments for each potato
- Voltage and current of large potato > those of small potato
- Both voltage and current in group 4 < those of groups 1-3

Results for large potato (Dehydrated)

	Voltage	Current
Experiment 1	1.409 V	286 μ A
Experiment 2	1.415 V	280 μ A
Experiment 3	1.399 V	278 μ A

Results for small potato (Dehydrated)

	Voltage	Current
Experiment 1	1.362 V	228 μ A
Experiment 2	1.312 V	235 μ A
Experiment 3	1.352 V	227 μ A