Vegetables – water content

**Objective**

To investigate how seasonings affect the water content of vegetables.

**Principles**

Osmosis is the movement of water through a semipermeable cell membrane. A semipermeable membrane allows only water to move in and out of cells. Water molecules will move from a less concentrated solution to a more concentrated solution. In raw fruits and vegetables, the cell membranes are semipermeable. Water flows into the cells when fruits and vegetables are soaked in plain water as the cytoplasm of the cells is more concentrate than water. In contrast, when salt, sugar, vinegar or syrup / brine with certain concentration is added, water flows out of the cells.

**Apparatus and Materials**

|  |  |
| --- | --- |
| Apparatus | Materials |
| 6 bowls / beakerMeasuring jugs / cylindersTimerChopper / Cook’s knifeChopping boardTeaspoonsSievesNon-stick frying panSpatula | 6 portions of cucumber slices (200g. for each)3 tsp salt1 tsp sugar1 tsp vinegar |

**Procedures**

1. Cut cucumbers in half lengthwise and cut each into semicircular slices about 1cm thick.
2. For Samples 1, 2 and 3
* Put 200g cucumber slices in each bowl / beaker. Add seasonings as indicated and mix well. Put aside for 20 minutes.
* Drain the excess liquid with a sieve. Measure and record the amount of liquid.
1. For Samples 4, 5 and 6
* Stir fry 200g cucumber slices for each sample, add seasonings as indicated
* Drain the excess liquid with a sieve immediately after cooking. Measure and record the amount of liquid.

| Sample | Seasoning | Cooking process | Amount of liquid |
| --- | --- | --- | --- |
| 1 | 1 tsp salt | - |  |
| 2 | 1 tsp sugar | -  |  |
| 3 | 1 tsp vinegar | - |  |
| 4 | nil | sitr fry for 5 mins |  |
| 5 | 1 tsp salt | add salt then stir fry for 5 mins |  |
| 6 | 1 tsp salt | stir fry for 5 mins then add salt |  |

**Questions for further thoughts**

* What are the impacts of controlling water content on the preparation and preservation of vegetables?
* Could the addition of seasonings affect the water content of other food commodities?