Chemical Tests for Basic Nutrients

**General Instruction:** Use small samples of food. A piece this big: 0 cm³ is enough. Grind the food well in the mortar to increase the surface area of the sample. If the food is a liquid, put ½ cm³ (no more!) in a test tube. Excessive amounts skew the results of the tests!

**Starch:** Place a sample of food in a space on a spot plate. Place a drop of iodine on the food.

- * Treated spot turns black, blue, or purple
- + Color change after several minutes, or around edges only
- o No color change, or spot turns iodine-color (brown)

**Fat:** Rub or squash a small amount of the food onto a paper towel. Place the towel on the hot plate, set on low, and examine after fifteen minutes.

- * Large grease spot under the food
- + Small grease spot
- o No grease spot

Note: most foods will leave a water spot which initially may appear as a grease spot, but the water will evaporate and the grease will not.

**Protein:** Place a small amount of food in a test tube and add just enough 10% NaOH (Sodium hydroxide) to cover it. Then add 0.5% CuSO₄ (copper sulfate) drop-by-drop and count the number of drops you add.

- * Liquid becomes purple or pink after 1 - 10 drops
- + Liquid becomes purple or pink after 10 - 20 drops
- o No color change

**Maltose:** (Sugars) Place a small amount of food in a test tube and add enough Benedict’s solution to cover it. Place the tube in boiling water bath or over a Bunsen burner. Watch for color changes in the liquid (not in the food).

- ** Liquid turns brown or red
- * Liquid turns orange or yellow
- + Liquid turns green
- o No color change (liquid remains blue).

**Glucose:** Place ground food sample in a test tube. Add 1 cm³ of water and shake the tube to dissolve or mix the food. Dip a Diastix into the solution and match it to the label on the bottle.

- ** Matches dark brown square on the bottle
- * Matches light brown square on the bottle
- + Matches pale brown square on the bottle
- o Matches dark aqua square on the bottle
Name: ________________________________

Water: Place a food sample in a dry test tube. Heat gently over a Bunsen burner flame. Look for drops of moisture forming on the inside of the test tube.

* Moisture appears  
  * No moisture

Vitamin C: This test can only be done with liquid foods or foods which can be completely dissolved. Place 1.0 ml of 0.1% Indophenol in a test tube. Add your food solution drop-by-drop and count the number of drops you add. At first the Indophenol may turn pink, which does not count – keep adding until the Indophenol becomes colorless. If it is still pink or blue after 20 drops, stop.

* Liquid turns colorless after 1 - 10 drops  
  + Liquid turns colorless after 11 - 20 drops  
  o No color change (liquid remains pink or blue).

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<th>Food Tests</th>
<th>Starch</th>
<th>Fat</th>
<th>Protein</th>
<th>Sugar</th>
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Questions
1. Did any of the foods tested contain all four basic nutrients? _________

2. If any, which __________________________________________

Did you test any foods which seemed to have no nutrients Value? _________

3. Which food seemed to be the least nutritious? ____________________________________________

   Is this food really “worthless”? _______ Explain: _________________________________________

If vitamin C was tested, what seems to be the effect of the following:

   Passage of time (storage)? _____________________________________________________________

   Cooking? __________________________________________________________________________