Chemical Tests for Basic Nutrients

General Instruction: Use *small* samples of food. A piece this big: 0 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 cm** (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% $CuSO_4$** (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 cm of water** and shake the tube to dissolve or mix the food. Dip a **Clinistix** into the solution and match it to the label on the bottle.

** Matches dark purple square on the bottle
* Matches medium lavender square on the bottle
\+ Matches pale lavender square on the bottle
o Matches dark pink 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
* o 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).

Food Tests	**Starch**	**Fat**	**Protein**	**Sugar**	**Glucose**	**Water**	**Vit C**
1)							
2)							
3)							
4)							
5)							
Unknown #							

Questions

1. Did any of the foods tested contain all four basic nutrients? _____

2. If any, which _____

3. Did you test any foods which seemed to have no nutrients Value? _____

   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? _____