Standard Laboratory Operating Procedure #205

Carbohydrate Testing for Fish and/or Fish Feed

Laboratory: Biotechnology/Environmental
Location: Science Lab
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General: Carbohydrates make up a large group of chemical compounds found in cells. Carbohydrates are an energy source found in foods providing fuel for cells. Testing for the presence of these molecules using indicators is a useful tool in multiple industries such as food science and animal science laboratories. For example, Benedict's solution is an indicator for monosaccharides (simple sugars) and Lugol's Iodine is an indicator for starch (polysaccharides).

Safety: Safety Glasses, Hot Gloves, Test Tube Holder

Materials (Refer to Flinn Kit, AP8635 Food Analysis Kit) www.flinnsci.com

Distilled Water Beaker,
250mL Disposable Pipettes
Pyrex Test Tubes
Test Tube Rack
Corning Hot Plate/Stirrer
Lugol's Iodine
Benedict's Solution
3 mL of Food Sample Solution
Stir Sticks
Microwell Plates
Vortex
P1000 Micropipetter
Blue Pipette Tips

Procedure

Prep of Solid Sample for Testing

1. Weigh out 5g of food sample using electronic balance, add sample into a mortar.
2. Add 10mL of distilled water to food sample in mortar, grind sample with a pestle to make into a slurry.
3. Filter slurry using filter paper and funnel, to collect liquid food sample into a small graduated cylinder or beaker.
4. Use the filtrate to complete the Carbohydrate Indicator Tests.
5. Repeat steps 1-4 for each sample.

Carbohydrate Indicator Tests: Monosaccharide Indicator Standard Test (Glucose):

1. Add 2 mL of food sample solution with 2 mL of Benedict's solution in a test tube.
2. Use Vortex to give sample a quick mix.
3. Place test tube containing food sample and Benedict's solution in a boiling water bath and heat for 2 minutes. The glucose present in the solution reacts with the copper sulfate in the Benedict reagent creating copper oxide, which results in an orange to red-brick precipitate. The intensity of the color depends on the concentration of glucose present in the sample.
4. Rate the precipitate color change as 0=no color change/negative, 1=weak/positive, 2=strong/positive, 3=very strong/positive

Starch Indicator Standard Test:

1. Add 500 uL of food sample solution with 250 uL of Lugol's Iodine Solution in a microwell plate.
2. Gently mix with a stir stick. DO NOT HEAT!
3. A bluish black color indicates a positive test for starch.
4. Rate the precipitate color change as 0=no color change/negative, 1=weak/positive, 2=strong/positive, 3=very strong/positive