**FOOD TESTS – PROTEINS AND LIPIDS (FATS)**

**AIM:** To identify proteins and lipids in pure form and lunch sample. **Skill: ORR/MM**

**APPARATUS and MATERIALS:**

* 6 Test tubes
* Test tube holder
* Test tube rack
* Glass rod/stirrer
* Droppers
* Cork/ stopper
* alcohol
* Sodium hydroxide solution (NaOH)
* 5% copper sulphate solution (CuSO4)
* Distilled water
* Proteins solution
* Sample of lunch – rice/ bread/chicken
* Labels

**DIAGRAM:**



DIAGRAM SHOWING THE SET UP FOR PROTEIN AND LIPIDS TESTS.

**METHOD:**

**Protein test:**

1. Label 2 test tubes protein and food sample.
2. Put 2cm3 of protein solution in a test tube labelled protein
3. Add the same amount of dilute sodium hydroxide (NaOH) followed by 4 drops of 5% Copper Sulphate solution. Shake gently
4. Observe and record the colour of the solution before and after.
5. Repeat these steps for the food sample instead of the proteins solution.

**Lipid (Emulsion) test:**

1. Label 2 clean test tubes – lipid and food sample.
2. Add 1cm3 oil to 2cm3 of alcohol in a test tube
3. Put a cork over the top of the test tube and shake it thoroughly
4. Add the mixture to a test tube with 2cm3 of water.
5. Observe and record if a milky appearance forms/ droplets of fat dispersed in the water.
6. .Repeat these steps for food sample instead of the oil.

*Rewrite your method into past tense in the space below or on a separate page.*

**METHOD**:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**RESULTS:** (*Add a title to the table and record your colour observations for each food test.)*

**Table** showing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- | --- | --- |
| **TEST** | **CONTENTS OF TEST TUBE** | **OBSERVATIONS** **(ORIGINAL AND FINAL)** | **INFERENCE** |
| **PROTEIN TEST** **(BIURET TEST)** |  |  |  |
|  |  |  |
| **LIPIDS TEST****EMULSION TEST** |  |  |  |
|  |  |  |

NOTE: An inference is a statement saying if the food substance (protein) is present or if the food substance is absent. OR that the observation is the positive for proteins.

**DISCUSSION:** (On a new page, using full sentences in paragraphs)

1. What are food tests used to identify?
2. Name the reagents that are used to identify proteins.
3. Why is there a need for alcohol before adding the lipid to the cold water (Hint: alcohol dissolves or breaks up the lipids into smaller globules.)
4. From your results what are the positive colour results that identify proteins and lipids.
5. Based on your results what biomolecules/ food groups is present in the food sample tested?
6. What precautions did you take in conducting your experiment?

(Hint: Use a clean test tube and syringes for each test; do not cross contaminate food samples and pure form solutions. )

**CONCLUSION:** (ON A NEW PAGE - Relate to your aim and findings/results.)

See a sample below:

In pure form, proteins are identified with a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; while lipids form a/ an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Food sample \_\_\_\_\_\_\_\_\_\_\_\_\_\_ contained \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, as observed by the positive colour results.

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| **MARKSCHEME – OBSERVING, RECORDING AND REPORTING ( ORR ) CRITERIA** | **Mk** |
| **Observations** | * Significant changes noted
* Original and final conditions compared
* Control noted OR diagram
 | **3** |
| **Recording**Tables/ Graph | * Title – above, in capitals - 1
* Column & row headings (with units) - 1
* Enclosed and neat -1

OR* Title – at base, in capitals, underlined -1
* Both axes labelled with units - 1
* Accurate plots – 1
 | **3** |
| **Reporting** | * Format - **ALL** sections present – 1
* Aim in capital letters - 1
* Acceptable language and expression –

grammar – 1 and spelling – 1 | **4** |
| **TOTAL** | **10** |

|  |  |
| --- | --- |
| **MARKSCHEME – MANIPULATION AND MEASUREMENT ( MM ) CRITERIA** | **Mks** |
| Assembly of water bath | * Position tripod over bunsen
* Position gauze on tripod
* Correct placement of Bunsen and tripod in centre of desk
 | **3** |
| Beaker | * Select appropriate size beaker
* 2/3 fill beaker with water
* Place carefully on centre of gauze on tripod
 | **3** |
| Bunsen Burner | * Slide Bunsen burner out
* Light Bunsen – turning on gas first
* Adjust flame on Bunsen under tripod
 | **4** |
| **TOTAL** | **10** |