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# EXPERIMENT 4 MEASUREMENT OF FAT/ OIL

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## 4.1 INTRODUCTION

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Fat or oil present in any food is the source of energy. The oils and fats are insoluble in water and soluble in some organic solvents. It may be present in the food material itself as in oilseeds or it may come during processing. Determination of fat / oil content is essential to know the calorific value of food.

### Objective

After studying this experiment, you should be able to:

- determine the fat content of foods.

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## 4.2 EXPERIMENT

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### 4.2.1 Principle

Fats and oils are soluble in organic solvents like hexane, Isopropanol etc. but other constituents are not. Hence, the fat present in the food sample is dissolved into the solvent and afterwards solvent is removed by evaporation distillation (Boiling point of solvent is much less than that of oils/fat).

### 4.2.2 Requirements (Equipment/Machinery/Instrument and Chemicals/ Material)

- Soxhlet apparatus
- Extraction filter paper thimble
- Analytical balance (Least count 0.001 g)
- Sample grinder
- Organic solvent (Hexane, Isopropanol or diethyl ether), acetone

### 4.2.3 Procedure

- Thoroughly wash the boiling flasks and rinse with commercial grade acetone to remove any residual oil/fat.
- Dry the flasks by placing in hot air oven for 3-4 hours

- Weigh the flasks and label them.
- Weigh the extraction filter paper thimbles (in duplicate) and label them.
- Transfer 2-5 g samples in pre-weighed thimbles and determine their accurate weight.
- Plugged these thimbles with non-adsorbent cotton and place them straight in the soxhlet extraction tube.
- Fill the extraction tubes with solvent sufficient enough so that the siphon system starts working.
- Now fix the Soxhlet assembly properly and switch on the heaters.
- As soon as the initiation of boiling is indicated start the water connected to condensers and allow the extraction for 8 hours.
- After 8 hours switch off the heaters and allow cooling.
- The solvent is evaporated using vacuum oven at 50°C or a water bath and then flasks with oil are weighed.

#### 4.2.4 Observations

Parameters	Sample number		
	1	2	3
Weight of empty flask (w1)			
Weight of empty thimble (w2)			
Weight of thimble + sample (w3)			
Weight of flask + oil (w4)			

Fat / oil content is calculated by using the following formula.

$$\% \text{Fat / oil (w.b.)} = \frac{(w4 - w1)}{(w3 - w2)} \times 100$$

#### 4.2.5 Results

Calculate oil/fat content using above formula. Take the average of three values and report the results as percentage.

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### 4.3 PRECAUTIONS

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- The water supply should not stop during the experiment. If so, the heaters should be put off.
- Take care that solvent should not come in contact with any heated surface as it is highly inflammable.