

DETERMINATION OF MOISTURE

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INTRODUCTION

There are various methods to determine the moisture content. The determination depends on the following criteria:-

- a) the form in which water is present
- b) nature of product analysed
- c) rapidity of determination
- d) accuracy desired
- e) availability and cost of equipment required

In the case of fish meat, the methods used are oven method, rapid methods by infra-red balance and microwave moisture checker.

I SAMPLE PREPARATION

Collect meat sample (≤ 100 g) and pass 2-3 times through food mincer, or chop very finely and mix thoroughly.

II INSTRUMENT

Method 1: oven (30-250°C), aluminium dish with lid.

Method 2: infra-red balance (Kett, model F-1A).

Method 3: microwave moisture checker (Anritsu, model K377C).

III ANALYTICAL PROCEDURE AND CALCULATION

METHOD 1: OVEN METHOD

1. Dry the empty dish and lid in the oven at 105°C for 30 min and transfer to the desiccator to cool (30 min). Weigh the empty dish and lid to 3 decimal places.
2. Weigh about 5 g of sample from (I) to the dish. Spread the meat with spatula. Replace the lid and weigh the dish and contents to 3 decimal places.
3. Place the dish with its lid partially covered in the oven. Dry for 16 hrs or overnight at 105°C.
4. After drying, transfer the dish with partially covered lid to the desiccator to cool. Reweigh the dish and its dried content.

CALCULATION

$$\text{Moisture (\%)} = \frac{W_1 - W_2}{W_1} \times 100$$

where W_1 = weight (g) of sample before drying.

W_2 = weight (g) of sample after drying.

METHOD 2: INFRA-RED METHOD

1. Balance the infra-red meter at zero level.
2. Evenly spread accurately 5 g meat sample from (I) onto the dish.
3. Place dish with sample on infra-red meter dish holder and level the balance.
4. Set lamp height to mark 7 and switch on the moisture meter. As moisture content in the sample decreases, lower the lamp height gradually until mark 5-4.5.
5. Continue to dry until the readout on the scale is constant (30-45 mins).

CALCULATION

(a) Results can be read directly from the balance scale or

(b) Calculate similarly the oven method i.e.;

$$\text{Moisture (\%)} = \frac{W_1 - W_2}{W_1} \times 100$$

where W_1 = weight of sample before drying.

W_2 = weight of sample after drying.

METHOD 3: MICROWAVE METHOD

1. Warm up and stabilise the microwave checker for half an hour before use.
2. Tare the sample dish containing glass fiber filter and Teflon ring to zero.
3. Evenly spread about 5 g meat sample on the sample dish and cover with filter paper held in place with Teflon ring.
4. Close the oven door. The weight of sample (g) is displayed on readout.
5. Set the required time at full power, 600w and at variable power, 300w (see below table).
6. Press the start switch to activate the drying.
7. At the end of drying, a buzzer sounds and the moisture content (%) is displayed directly.
8. Press the readout button to obtain the dried weight.
9. Repeat additional 30 sec at 300w until dried weight is constant.

SUITABLE TIME AND HEATING CONDITIONS FOR FISH MEAT SAMPLE

Sample	Power	
	600w	300w
Minced meat	120sec	60sec
Leached meat	300sec	30sec
Surimi	120sec	90sec

CALCULATION

The microwave method is calibrated to give direct readout in % moisture.

