ANNEX I

DETERMINATION OF THE MOISTURE CONTENT FOR DRIED FRUIT

METHOD I - LABORATORY REFERENCE METHOD [1]

1. Definition

The moisture content of dried fruit is defined as being the loss of mass determined under the operating conditions described in this Annex.

2. Principle

The principle of the method is the heating and drying of a sample of dried fruit at a temperature of 70 °C ± 1 °C at a pressure not exceeding 100 mm Hg.

3. Apparatus

Usual laboratory apparatus not otherwise specified, and the following items:

3.1 Electrically-heated constant-temperature oven, capable of being controlled at 70 ° at a pressure of 100 mm Hg

3.2 Dishes with lids, of corrosion-resistant metal of about 8.5 cm in diameter

3.3 Mincer, either hand or mechanically operated

3.4 Desiccator, containing an effective desiccant

3.5 Analytical balance.

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[1] *This method is the same as that prescribed by the AOAC: Official Methods of Analysis, XIIIth edition, 1980, 22.013 - Moisture in dried Fruit, Official Final Action.*

4. Procedure

4.1 *Preparation of a sample*

Take approximately 50 g of dried fruit from the laboratory sample, and mince these twice with the mincer.

4.2 *Test portion*

Place 2 g of finely divided asbestos[2] into the dish, tare the dish with its lid and the asbestos, dried beforehand. Weigh, to the nearest 0.01 g about 5 g of prepared sample.

4.3 *Determination*

Moisten the sample and the asbestos thoroughly with a few ml of hot water. Mix the sample and the asbestos together with a spatula. Wash the spatula with hot water to remove the sample residues from it, letting the residues and the water fall into the dish.

Heat the open dish on a boiling-water bath (bain-marie) to evaporate the water to dryness. Then place the dish, with the lid alongside it into the oven and continue drying for six hours at 70 °C under a pressure not exceeding 100 mm Hg, during which time the oven should not be opened. During drying admit a slow current of air (about 2 bubbles per second) to the oven, the air having been dried by passing through H_2SO_4. The metal dish must be placed in direct contact with the metal shelf of the oven. After drying, remove the dish, cover it immediately with its lid and place it in the desiccator. After cooling to ambient temperature, weigh the covered dish to the nearest 0.01 g.

5. Calculation and expression of results

The moisture content of the sample, as percentage by mass is given by the expression:

$$\textit{Moisture content} = \frac{M_1 - M_2}{M_1 - M_0} \times 100$$

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[2] *Dried sand which has previously been washed in hydrochloric acid and then rinsed thoroughly with water may be used in the place of the asbestos. Analysts using this technique should note that it is a deviation from the AOAC procedure, and should mention this in their report.*

Where:

M_o is the mass of the empty dish with its lid and containing the asbestos, g.

M_1 is the mass of the dish with its lid, asbestos and test portion before drying, g.

M_2 is the mass of the dish with its lid after drying, g.

The results are expressed to one decimal place.

Duplicate determinations should agree to 0.2 per cent moisture.

METHOD II - RAPID OR ROUTINE METHOD

1. Principle

A rapid method based on the principle of electrical conductivity.

2. Procedure

- Moisture in Prunes and Raisins
- Moisture Meter Method
- Final Action

Apparatus

Dried fruit moisture tester meter - Type A series (DFA of California, PO Box 270A, Santa Clara, CA 95)52); see Fig. 22.03 for elec. circuit.

Determination

Grind sample 3 times through food chopper, using cutter with 16 teeth. If testing hot fruit from processor, cool fruit as follows: Mix ca 60 g chopped solid $C0_2$ with fruit and then grind mixture three times before taking moisture reading. Pack ground sample into Bakelite cylinder with fingers, making certain that it is packed tightly around bottom electrode. Fill cylinder completely with tightly packed sample and level.

Lower top electrode and press it into sample until top electrode lever is against stop. Insert thermometer into ground sample until thermometer bulb is ca halfway between electrodes.

Select correct table for type and condition of fruit being tested (Table 22:01: natural or low moisture, tap 6 setting; Table 22:02: processed, tap 3 setting). Set switch (S2) to number given on table selected.

Plug tester into 110 v ac outlet and put switch to "on". (Red light indicates current). Keep push button down and turn dial so that meter needle moves toward 0. Adjust dial so that needle is at its lowest, or turning, point. After making fine adjustment of dial to meter 0 or turning point, read dial and then read thermometer.

Use of Tables

Choose temperature column of appropraite table nearest to sample temperature. Read down this column to figure closest to dial reading, then read across to "% Moisture" column.

Example

Examination of processed raisin sample gave following data: dial setting 76 and temperature 74°F, on tap 3. Looking down 74° column (Table 22:02), obtain 75.2 at 18.5% moisture and 78.4 at 19.0% moisture. Since reading is nearer to 18.5 than 19.0%, report sample as containing 18.5% moisture, or interpolate.

(Refs: JAOAC 52,858 (1969); 54,219 (1971); 55,202 (1972)).

DIAMGRAM
(SEE ECE/AGRI/116, ANNEX I)

Explication :

Item		Item	Value	Tolerance %	Power Rating, w
F1	Fuse 3AG 2A, 15v	R1	10K	1	1
S1	Push-button switch	R2	200K	1	1/2
L1	Néon light	R3	1K	1	1
T1	Isolating transformer 1-1, 120 v. 50 ma	R4	100K	1	1/2
PG1	Plug, 120 v	R5	40K	1	1/2
PG2	Plug to electrode	R6	20K	1	1/2
M1	Microammeter rectifier type 0-100 ma meter rectifier	R7 R.10	3K	1	1
CR1	Rectifier F4 (5M2483)	R.8	2,5K	-	10
CR2	Rectifier F4 (5M2483)	R.9	5K	-	10
S2-2	Wafer 7-point tape switch	R.11 R.12	1,5K 10K	10 ±5	1/2 (wire-wound)

TABLES 22:01, 22:02
(SEE ECE/AGRI/116, ANNEX I)