



**Economic and Social  
Council**

Distr.  
GENERAL

TRADE/WP.7/GE.2/2003/15/Add.7  
6 October 2003

Original: ENGLISH AND FRENCH

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ECONOMIC COMMISSION FOR EUROPE

COMMITTEE FOR TRADE, INDUSTRY AND  
ENTERPRISE DEVELOPMENT

Working Party on Agricultural Quality Standards

Specialized Section on Standardization of  
Dry and Dried Produce (Fruit)  
50<sup>th</sup> session, 24-27 June 2003, Geneva

REPORT OF THE FIFTIETH SESSION

Addendum 7

**REVISED ANNEX I TO THE STANDARD LAYOUT**

**Note by the Secretariat:** The Specialized Section agreed the text at its 50<sup>th</sup> session and recommends to the Working Party to adopt it as the revised Annex I to the UNECE Standard Layout for Dry and Dried Produce (Fruit).

## ANNEX I

### DETERMINATION OF THE MOISTURE CONTENT FOR DRIED FRUITS

#### METHOD 1 - LABORATORY REFERENCE METHOD

##### 1. Scope and application

This reference method serves to determine the moisture for dried fruits, as dried or desiccated apricots, figs, prunes, dates, grapes, apples, pears, etc.

##### 2. Reference

This method is based on the method prescribed by AOAC: AOAC Official Method 934.06 - Moisture in Dried Fruits

##### 3. Definition

Moisture content for dried fruits: conventionally, loss in mass measured under the operating conditions specified in AOAC Official Method 934.06. The moisture content is expressed as percentage by mass (grams per 100 grams).

##### 4. Principle

Determination of the moisture content of a test portion by drying in an oven 6 h at  $70 \pm 1^\circ \text{C}$  under pressure  $\leq 100 \text{ mm Hg}$  (13.3 kPa).

##### 5. Apparatus (see AOAC Official Method 934.06)

- 5.1 Analytical balance sensitive to 1 mg or better.
- 5.2 Mechanical mill or food chopper
- 5.3 Non-corrosive metal dish, provided with well-fitting lid, about 8.5 cm of diameter, allowing the test portion to be spread to about  $0.2 \text{ g/cm}^2$  or less.
- 5.4 Electric vacuum oven with thermostatic control capable of being regulated in normal operation at  $70 \pm 1^\circ \text{C}$  under pressure  $\leq 100 \text{ mm Hg}$  (13.3 kPa.).
- 5.6 Desiccator containing an effective desiccant.
- 5.7 Steam-bath

##### 6. Procedure

Follow the operating conditions as specified in AOAC Official Method 934.06 for Moisture in Dried Fruits, with the following additional specifications, concerning the preparation of the test sample:

Homogenize the laboratory sample and take a minimum of 100 g of dried fruits as a test sample. With non-pitted stone fruits (apricots, prunes, peaches, dates, etc), remove the stones using the rest as a test sample.

Grind or chop the test sample to obtain small particles, using either a mechanical mill or food chopper, without overheating the product, or cut and grind by hand if necessary, using knife, scissors, mortar and pestle or similar.

Use 5.0 to 10 g of the ground or chopped product as a test portion. Mix the test portion with circa 2 g of finely divided glass fiber filter or of washed sand, with the help of a spatula, and weigh to the nearest 0,001 g.

When necessary, moisten the test portion and the glass fiber filter or the washed sand with a few milliliters of water, mix thoroughly with the help of the spatula, and heat the open dish on the steam-bath to near dryness, before complete the drying in the vacuum oven.

Carry out two determinations on the same test sample.

## 7. Expression of results and test report

The moisture content, W, as percentage by mass of the sample (grams per 100 grams), is equal to:

$$W = \frac{M_1 - M_2}{M_1 - M_0} \times 100$$

where

$M_0$  is the mass, in grams, of the dish and lid. <sup>1, 2, 3</sup>

$M_1$  is the mass, in grams, of the dish and lid, and the test portion before drying. <sup>1, 2</sup>

$M_2$  is the mass, in grams, of the dish and lid, and the test portion after drying. <sup>1, 2</sup>

Take as a result the arithmetic mean of the results of the two determinations, if the difference between the results is smaller than 0.2%. The result has to be reported to one decimal place.

The test report shall show the method used and the results obtained. It shall mention any operating details not specified or optional, and incidents, likely to have influenced the results. It shall also include all the information necessary for the complete identification of the sample.

## 8. Repeatability

The difference between the results of two determinations carried out simultaneously or in rapid succession by the same analyst, using the same apparatus and in the same laboratory, should not be greater than 0.2 g of moisture per 100 g of sample.

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<sup>1</sup> Weigh to the nearest 0.001 g

<sup>2</sup> In case, plus the glass fibre or washed sand, and spatula

<sup>3</sup> After heating on the oven for 2 hours and cooling in the desiccator

## **METHOD 2: RAPID METHOD**

### **1. Scope and application**

This rapid method serves to determine the moisture for dried fruits. <sup>4</sup>

### **2. Reference**

This method is based on the method prescribed by AOAC: AOAC Official Method 972.20 - Moisture in Prunes and Raisins (Moisture Meter Method). This method is also commonly used as unofficial method for the determination of moisture content in other kinds of dried fruits.

### **3. Definition**

Moisture content for dried fruits: conventionally, correlation between moisture content and conductance-temperature measured under the operating conditions specified in AOAC Official Method 972.20. The moisture content is expressed as percentage by mass (grams per 100 grams).

### **4. Principle**

Determination of the conductance and temperature of a test portion by the moisture tester meter and under the operating conditions specified in AOAC Official Method 972.20. The moisture tester meter has to be calibrated according to the laboratory method, for each kind of dried fruit, taken into account the variety or commercial type and the type of presentation (whole, pitted, slabs, dices, etc) and, when necessary, the crop year and/or the origin.

### **5. Apparatus (see AOAC Official Method 972.20)**

- 5.1 Moisture tester meter type A series
- 5.2 Thermometer (if not incorporated to the moisture tester meter)
- 5.3 Mechanical mill or food chopper

### **6. Procedure**

Follow the operating conditions as specified in AOAC Official Method 972.20 - Moisture in Prunes and Raisins (Moisture Meter Method).

Carry out the determination on two test portions

### **7. Expression of results and test report**

#### **7.1 Result**

The result should be the arithmetic mean of the two determinations. Report the result to one decimal place.

#### **7.2 Test report**

The test report must state the method used and the results obtained. The report must contain all the information necessary for the complete identification of the sample.

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<sup>4</sup> *It is also possible to employ other rapid methods based on different conductance methods, or on the principle of loss of mass by heating with apparatus including an halogen or infra-red lamp and a built-in analytical balance, always at condition that the method and the apparatus has to be calibrated according the laboratory method.*