

COMMISSION REGULATION (EEC) No 558/93
of 10 March 1993

on the refractometry method of measuring dry soluble residue in products processed from fruit and vegetables, repealing Regulation (EEC) No 543/86 and amending Annex I to Council Regulation (EEC) No 2658/87

THE COMMISSION OF THE EUROPEAN COMMUNITIES,
Having regard to the Treaty establishing the European Economic Community,

Having regard to Council Regulation (EEC) No 426/86 of 24 February 1986 on the common organization of the market in products processed from fruit and vegetables ⁽¹⁾, as last amended by Regulation (EEC) No 1569/92 ⁽²⁾, and in particular Articles 10 (1) and 17 (1) thereof,

Whereas Article 10 (7) of Regulation (EEC) No 426/86 provides that 'added sugars content' for the products listed in Annex III means the reading obtained by using a refractometer, multiplied by a specific factor and reduced by a fixed figure;

Whereas the refractometry method to be applied is defined in Commission Regulation (EEC) No 543/86 ⁽³⁾, laying down methods of measuring sugar processed from fruit and vegetables; whereas it has proved necessary to make the appropriate amendments to this method, in particular in order to specify the procedure for alcoholic products; whereas the introduction of the new method laid down in this Regulation makes it necessary to repeal Regulation (EEC) No 543/86;

Whereas the repeal of Regulation (EEC) No 543/86 makes it necessary to adapt Annex 1 to Council Regulation (EEC) No 2658/87 of 23 July 1987 on the tariff and statistical nomenclature and on the Common Customs Tariff ⁽⁴⁾, as last amended by Commission Regulation (EEC) No 3800/92 ⁽⁵⁾;

Whereas the measures provided for in this Regulation are in accordance with the opinion of the Management Committee for Products Processed from Fruit and Vegetables,

HAS ADOPTED THIS REGULATION:

Article 1

The refractometry method to be used for determining the sugar content for the products listed in Annex III to Regulation (EEC) No 426/86 shall be as set out in the Annex hereto.

Article 2

Regulation (EEC) No 543/86 is hereby repealed.

Article 3

Annex I to Regulation (EEC) No 2658/87 is hereby amended as follows: the references to Regulation (EEC) No 543/86 in Additional Note No 1 in Chapter 8 and in Additional Notes Nos 2 and 6 in Chapter 20 are replaced by references to this Regulation.

Article 4

This Regulation shall enter into force on the 21st day following its publication in the *Official Journal of the European Communities*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 10 March 1993.

For the Commission

René STEICHEN

Member of the Commission

⁽¹⁾ OJ No L 49, 27. 2. 1986, p. 1.
⁽²⁾ OJ No L 166, 20. 6. 1992, p. 5.
⁽³⁾ OJ No L 55, 1. 3. 1986, p. 41.
⁽⁴⁾ OJ No L 256, 7. 9. 1987, p. 1.
⁽⁵⁾ OJ No L 384, 30. 12. 1992, p. 8.

ANNEX

METHOD OF MEASURING DRY SOLUBLE RESIDUE IN PRODUCTS PROCESSED FROM FRUIT AND VEGETABLES BY REFRACTOMETRY**I. Field of application**

Application of this method is related to the quantity of sugar present in the product analysed. The presence of amino acids, salts of organic acids, inorganic salts, fat, flavonoids and alcohol alters the refractive index.

II. Definition

Dry soluble residue content (determined by refractometry) means the percentage weight of sucrose in an aqueous solution of sucrose which, under given conditions, has the same refractive index as the product analysed. The product's dry soluble residue content is expressed in grams per 100 grams (g/100 g).

III. Principle

Deduction of the dry soluble residue content of a product from its refractive index.

IV. Apparatus

Abbe-type refractometer

This apparatus must enable the percentage weight of sucrose to be determined to the nearest $\pm 0,1$ %.

The refractometer must have a thermometer with a scale extending at least from $+ 15^{\circ}\text{C}$ to $+ 25^{\circ}\text{C}$. It must also have a water circulator enabling the temperature to be adjusted with an accuracy of $\pm 0,5^{\circ}\text{C}$.

Operating instructions for this apparatus, and in particular those dealing with calibration and light source, must be strictly followed.

V. Method**1. Preparation of sample****1.1. Liquid products**

Mix carefully and proceed to determination.

1.2. Semi-dense products, purées, fruit juices with matter in suspension

Carefully mix an average laboratory sample and then homogenize. Strain part of the sample through dry gauze folded in four, remove the first drops and proceed to determination on the filtrate.

1.3. Dense products (jams and jellies)

If the previously homogenized product cannot be used directly, weigh 40 g of the product to the nearest 0,01 g in a 250 ml beaker and add 100 ml of distilled water.

Boil gently for two or three minutes, stirring with a glass rod.

Cool, pour the contents of the beaker into an appropriate tared vessel using distilled water as a flushing liquid, add distilled water so as to obtain about 200 g of product, weigh it to the nearest 0,01 g, and mix the solution thoroughly.

Allow to stand for 20 minutes, then strain through a folded filter or a Büchner funnel.

Make determination on the filtrate.

1.4. Frozen products

Defrost and remove stones or pips and cores. Mix the product with the liquid formed during defrosting and proceed as in 1.2 or 1.3.

1.5. Dry products or products containing whole fruit or pieces of fruit

Cut the laboratory sample — or part of it — into small pieces, remove stones or pips and cores and mix carefully.

Weigh 10 to 20 g of the product to the nearest 0,01 g in a beaker.

Add distilled water corresponding to five times the weight of the product. Heat in a water bath for 30 minutes stirring occasionally with a glass rod. When cool, continue as described in 1.3.

1.6. Products containing alcohol

Weigh about 100 g of sample to the nearest 0,01 g into a tared beaker. Place the beaker in a bath of boiled water for 30 minutes, stirring occasionally with a glass rod, and add distilled water if necessary.

Where the alcohol content exceeds about 5 % mass add more distilled water and heat again in the water bath for 45 minutes.

After cooling weigh the final contents of the vessel, filter if necessary, and continue with the determination.

2. Determination

Bring the sample to the measurement temperature by immersing the container in a water bath at the required temperature.

Place a small sample on the lower prism of the refractometer, taking care to ensure that the sample covers the glass surface uniformly when the prisms are pressed against each other. Measure in accordance with the operating instructions for the apparatus used.

Read the percentage weight of sucrose to the nearest 0,1 %.

Make at least two determinations on the same prepared sample.

VI. Expression of results

Calculation and formulation

The dry soluble residue content, conventionally expressed in grams of sucrose per 100 grams of product, is calculated as follows. The percentage sucrose content indicated by refractometry is used directly. If the reading is made at a temperature other than + 20 °C, correct as indicated in the attached table.

If measurement has been made on a dilute solution, the dry soluble residue content (M) is calculated using the following formula :

$$M = M' \times \frac{100}{E}$$

M' being the weight (in grams) of dry soluble residue per 100 g of product indicated by the refractometer and E the weight (in grams) of product per 100 g of solution.

Corrections when determination is made at a temperature other than 20 °C

Temperature °C	Sucrose in grams per 100 grams of product									
	5	10	15	20	30	40	50	60	70	75
	Subtract									
15	0,25	0,27	0,31	0,31	0,34	0,35	0,36	0,37	0,36	0,36
16	0,21	0,23	0,27	0,27	0,29	0,31	0,31	0,32	0,31	0,23
17	0,16	0,18	0,20	0,20	0,22	0,23	0,23	0,23	0,20	0,17
18	0,11	0,12	0,14	0,15	0,16	0,16	0,15	0,12	0,12	0,09
19	0,06	0,07	0,08	0,08	0,08	0,09	0,09	0,08	0,07	0,05
	Add									
21	0,06	0,07	0,07	0,07	0,07	0,07	0,07	0,07	0,07	0,07
22	0,12	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14
23	0,18	0,20	0,20	0,21	0,21	0,21	0,21	0,22	0,22	0,22
24	0,24	0,26	0,26	0,27	0,28	0,28	0,28	0,28	0,29	0,29
25	0,30	0,32	0,32	0,34	0,36	0,36	0,36	0,36	0,36	0,37

The temperature may not vary by more than ± 5 °C from 20 °C.