

SCIENTIFIC SUB-COMMITTEE

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9th Session

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Brussels, 7 June 1995.

ANALYTICAL METHODS AND CRITERIA FOR DISTINGUISHING
BETWEEN CONCENTRATED AND NORMAL FRUIT JUICES

(Item II.6 on Agenda)

Reference documents :

37.574 (RSC/7)
37.650 Annex XII, para. 34 to 36 (RSC/7 - Report)
37.499 (HSC/10)
37.700 Annex D, para. 35 (HSC/10 - Report)
37.867 (RSC/8)
37.875 (RSC/8)
37.850 Annex IV (RSC/8 - Report)
39.152 (RSC/11)
39.200 Annex VII.B (RSC/11 - Report)
39.400 Annex E, para. 12 (HSC/15 - Report)

I. BACKGROUND

1. The Harmonized System Review Sub-Committee at its 11th Session re-examined a proposal to create new subheadings for "concentrated fruit juices" in heading 20.09, which was left in abeyance during the last review cycle and resubmitted in November 1994 by the Food and Agriculture Organization of the United Nations (FAO).
2. The information received during the last review cycle from FAO and the United States Administration and from the Japanese Administration with regard to possible definitions have already been presented in Docs. 37.867 and 37.875 and summarized in

Doc. 39.152. For ease of reference, the summary has been reproduced below.

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3. In the information provided by FAO (Doc. 37.867), concentrated juice has been defined as "the unfermented but fermentable juice (after reconstitution) preserved exclusively by physical means, obtained by the process of concentration from the juice of sound fruits". In addition, "the process of concentration consists of the physical removal of water until the product has a certain percentage of soluble fruit solid content as determined by a refractometer at 20 degrees Celsius, uncorrected for acidity and read as degrees Brix on the International Sucrose Scale". The minimum percentage varies from 20% to 30%, depending on the nature of the juice.
4. According to the legal definition submitted by the United States Administration (see Doc. 37.867), "...the degree of concentration shall be calculated on a volume basis to the nearest 0.5 degree, as determined by the ratio of the Brix value of the imported concentrated juice to that of the reconstituted juice, corrected for differences of specific gravity of juices. Any juice having a degree of concentration of less than 1.5 (as determined before correction to the nearest 0.5 degree) shall be regarded as a natural unconcentrated juice". The U.S. submission also states :
 - 4.1. "In determining the degree of concentration of mixed fruit juices, the mixture shall be considered as being wholly of the component juice having the lowest Brix value.
 - 4.2. The term "Brix value" means the refractometric sucrose value of the juice, adjusted to compensate for the effect of any added sweetening materials, and thereafter corrected for acid".
5. Concerning the methods of laboratory analysis for distinguishing between "concentrated juices" and "straight juices", the Japanese Administration (see Doc. 37.875) has suggested that, among several possible approaches, "...the quantitative analysis of nitrogen present in juice as amino-function compounds appears to be most appropriate because the level of such nitrogen content is rather consistent and stable irrespective of the origin and maturity of fruit".
6. It is recalled that at the Eighth Session of the Review Sub-Committee :

- (a) The definition based on Brix value was criticized as being difficult to apply, because the Brix value indicated only the sugar content of the juice; the refractometer did not indicate whether the sugar came from the fruit or had been added. Further, it would be necessary to agree on a sugar content threshold for each kind of juice and to create a list of compensation values since the sugar content in juices varied for many reasons;
- (b) The definition based on nitrogen content was criticized on the grounds that this was not a commonly accepted method for determining whether a juice was concentrated or not; and
- (c) The Swiss Delegate proposed the following definition, which was not discussed by the Sub-Committee but was based on the same criterion of partial removal of water as the FAO definition :

"Concentrated juices are juices in which the water content has been reduced to a level below that found in natural juices".

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- 7. At its Eleventh Session, the Review Sub-Committee agreed with the FAO proposal that concentrated juices should be separately identified in the Harmonized System.
- 8. The Delegate of the EC stated that none of the criteria considered in the past had been acceptable to all Contracting Parties. With regard to the Secretariat proposal to the Review Sub-Committee for adopting a simple numerical value (e.g., density criterion) in place of the expression "concentrated juice" (see Doc. 39.152, paragraph 14), he questioned whether this criterion could be used to identify concentrated juices since the density indicated the sugar content (natural and added) and the criterion could easily be influenced by varying the sugar content. The study should also determine the threshold (value) for the sugar content of each product and establish a list of compensatory values (see Annex VII.B, RSC/11 Report).

9. The Review Sub-Committee therefore noted that clear definitions and specific analytical methods workable at international level were needed for distinguishing "concentrated juices". Taking into account that finding an analytical method for the "mixtures of juices" would be very difficult, the study should be restricted to concentrated juices of orange, grapefruit, other single citrus fruit, pineapple, grape and apple of heading 20.09.
10. It was also agreed that the Scientific Sub-Committee should be requested to examine the question of analytical methods and thresholds for different kinds of juices, and administrations were asked to provide the Secretariat with definitions and analytical methods which they used in their laboratories.

II. SECRETARIAT ACTION AND COMMENTS

11. On 20 March 1995 the Secretariat invited several administrations to submit information on possible definitions and analytical methods. In addition, the International Standards Organization (ISO), the International Federation of Fruit Juice Producers and the Association of Official Analytical Chemists (AOAC) were requested to provide technical information on the same questions.
12. So far, no information has been received from the administrations, the International Standards Organization and the International Federation of Fruit Juice Producers.
13. An extract from the information received from the Association of Official Analytical Chemists is reproduced below.
14. "...AOAC publishes its approved methods in the compendium, "Official Methods of Analysis". The compendium contains a chapter of methods for fruit and fruit products, plus methods in other chapters that might appropriately be applied to fruit products. I have included a listing of methods that might be considered appropriate for the work you are undertaking.
15. Also, for your information, three new methods are presently under study: LC method for carbohydrates in fruit juices, AAS method for major metals in fruit juices, and SNIF-NMR method for beet sugar in fruit juices, the latter of which will probably be the definitive method for sugars in juice.
16. In addition, I am transmitting your letter and request for information to the Technical Committee on Juice and Juice Products. This Committee, although not an AOAC entity, cooperates with AOAC on matters of mutual interest, and in particular addresses the issue of juice characterization..."
17. The above-mentioned list of methods applicable to juice analysis has been reproduced in the Annex to this document (English only).
18. From the information previously received from administrations and the RSC's discussions so far, the Secretariat understands that:

- (a) Both the "Brix value" and the "density" criteria indicate the "sugar content" of the fruit juices. Since the sugar content in juices varies according to production area, season and type of fruit, if those criteria are to be accepted, it will be necessary to agree on a sugar content threshold for each kind of juice and to create a list of compensatory values. However, those criteria have the disadvantage that no distinction can be made between natural sugar and added sugar;
- (b) The "nitrogen content" criterion does not seem to be commonly applied (see paragraph 6(b) above) and has not been further discussed by the RSC. Further information from the Japanese Administration on the validity of this criterion in actual use might help the Sub-Committee to form its opinion.
- (c) The "water content" criterion (see paragraph 6(c) above) has not been discussed by the RSC either. This might be a valid criterion for distinguishing between "concentrated" and "normal" juices. However, if this criterion is to be used, the analytical method for determining water content and the thresholds to be used will certainly need to be established.

19. In the absence of adequate information, the Secretariat is not in a position to contribute much towards finding concrete answers. The administrations (laboratories) are therefore requested to provide further information on the questions asked by the Review Sub-Committee.

III. CONCLUSION

20. Taking the Secretariat's comments in paragraphs 18 and 19 above into account, the Sub-Committee is requested to :

- (a) examine what method of analysis, workable at international level, can be applied for distinguishing between "concentrated" and "normal" juices (oranges, grapefruits, other single citrus fruits, pineapples, grapes and apples);

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- (b) consider, depending upon the requirements of the method of analysis to be applied, what thresholds should be used for each of the kinds of juices mentioned above.

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