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SCIENTIFIC SUB-COMMITTEE
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PROPOSAL BY THE CANADIAN ADMINISTRATION FOR AMENDMENTS TO THE NOMENCLATURE CONCERNING CANOLA SEEDS, CANOLA OIL AND CANOLA MEAL

(Item II.9 on Agenda)

Reference documents :

40.106 (RSC/14)
40.470, Annex C/11 (RSC/14 - Report)
40.413, paragraph 56, (HSC/18)
40.600, Annex E/1, paragraph 41, (HSC/18 - Report)
40.778 (RSC/15)
40.920, Annex A/7 (RSC/15 - Report)
40.881, paragraph 12, (HSC/19)
41.100, Annex E/1, paragraph 13, (HSC/19 - Report)

I. BACKGROUND

1. The Review Sub-Committee at its 14th and 15th Sessions examined the following Canadian proposal for amendments to the Nomenclature concerning canola seeds, canola oil and canola meal :

Heading No. 12.05

(a) Revised heading text and new subheading :

12.05 - Rape or colza seeds (including canola seeds), whether or not broken.

1205.10 - Canola seeds
1205.90 - Other

(b) New Subheading Note 1 to Chapter 12 :

File No. 2603

For the purposes of subheading No. 1205.10, the expression “canola seeds” means rape or colza seeds yielding a fixed oil which has an erucic acid content of less that 2% by weight and yielding a solid component which contains less than 30 micromoles per gram of any one or any mixture of 3-butenyl glucosinolate, 4-pentenyl glucosinolate, 2-hydroxy-3-butenyl glucosinolate, and 2-hydroxy-4-pentenyl glucosinolate.

Heading No. 15.14

(a) Revised structure for current subheadings in heading No. 15.14 :

- Canola oil and its fractions :

1514.11 -- Crude oil
1514.19 -- Other

- Other :

1514.91 -- Crude oil
1514.99 -- Other

(b) New Subheading Note 1 to Chapter 15 :

For the purposes of subheadings Nos. 1514.11 and 1514.19, the expression “canola oil” means the fixed oil from rape or colza seeds, where the oil contains less than 2% erucic acid by weight.

Heading No. 23.06

(a) Revised structure for current subheading No. 2306.40 :

- Of rape or colza seeds (including canola seeds)

2306.41 -- Canola seeds
2306.49 -- Other

(b) New Subheading Note 1 to Chapter 23 :

For the purposes of subheading No. 2306.41, the expression “canola seeds” means seeds as defined in Subheading Note 1 to Chapter 12.

2. At the 15th Session of the Review Sub-Committee, the Delegate of Canada pointed out that the key factor to identify canola products was their (i) low erucic acid content (less than 2%) and (ii) low glucosinolate content (less than 30 µm/g), which could be determined by widely applicable test methods of which his Administration could supply the details.

3. After discussion, the Review Sub-Committee agreed that the questions of (a) the criteria for identifying canola seeds and canola products and (b) methods of analysis for determining these criteria should be referred to the Scientific Sub-Committee. The Canadian Administration was requested to provide information regarding the methods of analysis indicated in paragraph 13 of Doc. 40.778 to the Scientific Sub-Committee.

II. NOTE FROM THE CANADIAN ADMINISTRATION

4. On 18 September 1997, the Secretariat received information from the Canadian Administration, as excerpted below :

5. In paragraph 12 of Doc. 40.778, the Secretariat raised the question of the level of glucosinolates in normal rapeseed. While detailed information on glucosinolates is difficult to obtain, an idea of this level can be gained from Weiss, E.A. (1983) *Oilseed Crops*, Longman, London which states on page 213 that "present levels of glucosinolates are around 150 µmol/g...."

6. The terms rapeseed and colza are synonymous and cover both high and low erucic acid rapeseeds.

7. Conventional rapeseed oil is not an edible oil because of its high erucic acid level and thus conventional rapeseed is grown for industrial uses.

8. While "Canola" is a trade name, it is also accepted as a generic term for a group of cultivars (varieties) of rapeseed that have low erucic acid and low glucosinolate contents. The Fifth edition of "Bailey's Industrial Oil & Fat Products" recognises "Canola oil" as an edible oil like coconut, corn, olive, soybean and other edible oils and, like the other edible oils, "Bailey's" devotes a chapter to its production and properties.

9. The seeds used to produce the oils and meals of canola are different from conventional rapeseed and should be treated separately. As with the canola oil, the proposed definition of canola seed presented in Doc. 40.106 (see the proposal above for New Subheading Note 1 to Chapter 12) covers all rapeseed cultivars that meet the criteria for erucic acid and glucosinolate levels regardless of geographic region...".

10. The information provided with by Canada also includes an Annex of 57 pages concerning analytical methods for determining erucic acid content or glucosinolate content of canola oil or canola meal. The full texts of these methods (English version only) will be available for reference by delegates during the Session. The Secretariat has prepared the following extracts therefrom.

AOAC (Association of Official Analytical Chemists) Official Method 985.20, Erucic Acid in Oils and Fats : Thin Layer and Gas Chromatographic Method

11. Principle : Constituent fatty acids are converted to methyl esters, separated by low temperature argentation thin layer chromatography, and quantitated by gas chromatography.

12. Apparatus : Glassware (beakers, round-bottom flasks and pointed bottom tubes), distillation device (for ethyl ether), columns, oven, TLC plates, TLC applicator, TLC developing tank, TLC deep-freeze unit, UV lamp and gas chromatograph.

13. Reagents : n-Hexane, toluene, methanol, ethyl ether, TLC developing solvent, methyl erucate standard solution, silver nitrate solution, methyl tetracosanoate standard solution, and TLC spray reagent.

AOAC Official Method 975.39, Docosenoic Acid in Oils and Fats : Gas Chromatographic Method

14. Principle : Erucic acid, an isomer of docosenoic acid, is characteristic acid of rapeseed. Oil or fat is converted to methyl esters, which are determined by GC, with methyl tetracosanoate as internal standard.

15. Apparatus : Gas chromatograph and transesterification flask.

16. Reagents : Hexane, anhydrous methanol, sodium methoxide solution, methyl erucate standard solution and methyl tetracosanoate standard solution.

Determination of Glucosinolates by High Performance Liquid Chromatography : Method of the Canadian Grain Commission Grain Research Laboratory, D.R. DeClercq and C.T Thorsteinson, 1990 (Reference : Daun, J.K., and D.I. MacGregor, Glucosinolates in Seeds and Residues)

17. Principle : Aqueous extraction of glucosinolates followed by purification and desulfation on micro ion-exchange columns. Isolated desulphoglucosinolates are analysed directly by HPLC.

18. Reagents : Pyridine-acetate buffers, sodium acetate, barium acetate and lead acetate, sodium hydroxide, internal standard (benzylglucosinolate), DEAE Sephadex A-25 and SP Sephadex C-25, Sulfatase and reagent grade ethanol.

19. Apparatus : Micro-grinder, desiccator, analytical balance, water bath or block-type heater, oven, centrifuge, stirrer, micro ion exchange columns, borosilicate glass tubes, high performance liquid chromatograph.

A Rapid and Simple Assay for Identifying Low Glucosinolate Rapeseed, D.I. McGregor and R.K. Downey, Canadian Journal of Plant Science, January 1975

20. Method for the identification of seed from low glucosinolate cultivars of rapeseed, developed using a semi-quantitative, glucose-specific test paper containing glucose oxidase, peroxidase and the chromogen, o-tolidine. Glucose released from hydrolysis of the glucosinolates by the endogenous myrosinase in aqueous seed extracts was measured after removal of interfering substances with charcoal. Greater sensitivity at the lower end of the glucose test-paper range allowed identification of low glucosinolate seed from mixtures with normal glucosinolate seeds when the glucosinolate content of the mixture was double, or more, the content of the low glucosinolate seed.

Canadian Patent : Colorimetric Analytical Test Apparatus, Inventor : Douglas Ian McGregor

21. An analytical test apparatus suitable for the colorimetric determination of glucose in the presence of inhibitors includes :

- an inert solid backing having a sample receiving zone (a) spaced from an adsorbent zone (b) and test zone (c),
- a wick to transport liquid from zone (a) to zone (b),
- activated carbon adsorbent at zone (b), and
- glucose test paper at test zone (c);

the three zones being in liquid-conducting capillary contact. The amount and nature of the adsorbent is selected to preferentially remove the inhibitors but not the glucose. The apparatus is especially useful as a stick for determining glucosinolate contents of oilseeds such as rapeseed.

III. SECRETARIAT COMMENTS

22. Information concerning canola seed, canola oil and canola meal found by the Secretariat in (i) (Oil Crops of the World, G. Robbelen, R.K. Downey and A. Ashri, McGraw-Hill, In., 1989, and (ii) Bailey's Industrial Oil & Fat Products, Fifth Edition, edited by Y.H. Hui, Wiley Interscience, 1996) are provided in paragraph 13 of Doc. 40.106 and paragraph 6 of Doc. 40.778, respectively.

23. According to the technical literature cited above, two distinguishing characteristics of canola seed are its lower erucic acid content and glucosinolate content than those of conventional rape and colza seed. The distinguishing criteria suggested by Canada, that is, (a) less that 2% erucic acid content in the oil fraction and (b) less than 30 micromoles glucosinolate per gram of the solid component are based on these characteristics of canola seed.

24. In this connection, tables found in Bailey's Industrial Oil & Fat Products regarding the specifications of "crude canola oil types" and "canola meal" were set out in the Annex to Doc. 40.778 (reproduced as Annex to this document). The Secretariat has no difficulty with setting up an upper limit of 2% erucic acid level for canola oil, since this level is considerably higher for conventional rapeseed oil (40-55%). However, the Secretariat is uncertain as to the proposed upper limit of 30 micromoles/g glucosinolate content for canola meal because no reference has been found, in the information so far obtained, concerning the level of glucosinolate in regular rapeseed. The Sub-Committee is invited to determine whether the information provided by Canada in paragraph 5 above is acceptable.

25. The Secretariat also is not in a position to comment whether the analytical test methods summarised above are appropriate for determining the erucic acid level in oils or glucosinolate level in meals obtained from seeds to distinguish between products of canola and rapeseed. The Sub-Committee is invited to indicate as to which of these analytical methods could be readily applied world-wide.

IV. CONCLUSION

26. Taking into account the above information provided by the Canadian Administration and the comments by the Secretariat, the Sub-Committee is requested to examine :

(a) whether the criteria proposed by Canada (i.e., an upper limit of 2% erucic acid level in canola oil and an upper limit of 30 µmol/g glucosinolate level in solid component) are appropriate for distinguishing canola seeds and other canola products from conventional rape or colza seeds and their products; and

(b) whether any one or more of the methods of analysis summarised in paragraphs 15 to 25 above could be readily used world-wide to determine these criteria and, if not, any other test methods could be applied for the same purposes.

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