CODEX ALIMENTARIUS COMMISSION E

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World Health Organization

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Agenda Item 18 **CX/CF 14/8/18**
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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON CONTAMINANTS IN FOODS

Eighth Session
The Hague, The Netherlands, 31 March – 4 April 2014

DISCUSSION PAPER ON HALOGENATED SOLVENTS

Background

1. At its 7th session the Committee on Contaminants in Foods (CCCF) (April 2013) considered the proposal of Committee on Fats and Oils (CCFO) to transfer maximum levels for halogenated solvents from the *Standard for Olive Oils and Olive Pomace Oils* (CODEX STAN 33-1981) to the *General Standard for Contaminants and Toxins in Food and Feed* (GSCTFF). The Committee noted that before such action could be taken, further consideration was necessary as to what substances were included in the term "halogenated solvents" and whether the levels were for food safety or quality purposes. The Committee agreed that the Delegation of European Union would prepare a discussion paper on this matter for consideration at its next session (REP13/CF, para. 11).

2. The Committee is invited to consider the conclusion in paragraph 9 based on the considerations provided in paragraphs 3 – 8 in order to determine how to proceed with request of Committee on Fats and Oils in regard to the transfer of maximum levels for halogenated solvents from the *Standard for Olive Oils and Olive Pomace Oils* to *the General Standard for Contaminants and Toxins in Food and Feed*.

Considerations

3. A halogenated solvent refers to an organic solvent which contains halogenic atoms (chlorine, fluorine, bromine or iodine). Examples include compounds such as bromoform, chloroform and trichloroethylene. Halogenated solvents have been widely used in many industrial and commercial applications due to their excellent ability to dissolve oils, their fast evaporation rates and their chemical stability. Major uses were as dry cleaning fluids, degreasing solvents, electrical cleaning solvents, paint strippers, propellants and refrigerants. However, because halogenated organic solvents are often environmental and health hazards, their use in open applications has now been banned worldwide. They are still widely used by chemical and pharmaceutical industries in closed applications. Some halogenated solvents are naturally occurring, especially in marine environments.

4. Health effects from direct exposure to halogenated solvents are well known and include toxicity to the nervous system, reproductive damage, liver and kidney damage, respiratory impairment, cancer and dermatitis. Human health effects from low environmental exposures are unknown. Halogenated solvents generally do not persist in soil or water but some of the widely used substances, such as trichloroethene, can contaminate surface and ground water. Also chlorination can result in contamination of water with halogenated solvents, mainly trihalomethanes. For these reasons, maximum levels (ML) for certain halogenated solvents in drinking water have been set by many jurisdictions, including the WHO. (WHO Guidelines for drinking water quality 4th edition–Chapter 8 http://whqlibdoc.who.int/publications/2011/9789241548151_eng.pdf)

5. For some halogenated solvents, such as bromomethane and dichloroethane, which are or have been used as pesticides, maximum residue levels (MRL) have been set in relevant food categories in certain jurisdictions, such as the European Union (EU).

6. JECFA evaluated dichloromethane in 1992 and specifications have been set and revised by JECFA in 1998.

   Evaluation in 1992: http://apps.who.int/food-additives-contaminants-jecfa-database/chemical.aspx?chemID=2589

   Specification in 1998: http://www.fao.org/ag/agn/jecfa-additives/details.html?id=708

   JECFA concluded in its evaluation in 1992 that "*the use should be limited to current uses as an extraction solvent for spice oleoresins and the decaffeination of coffee and tea, and for food additives in which previous specifications drawn up by the Committee included residues of dichloromethane*"

7. In the EU, maximum levels for residues of two halogenated solvents have been set in Directive 2009/32/EC of the European Parliament and of the Council of 23 April 2009 on the approximation of the laws of the Member States on extraction solvents used in the production of foodstuffs and food ingredients.

   Dichloromethane is authorised for use for the decaffeination of, or removal of irritants and bitterings from coffee and tea. A maximum level of 2 mg/kg in the roasted coffee and 5 mg/kg in tea has been established.

   Furthermore maximum residue levels have been established for dichloromethane (0.02 mg/l) and 1,1,1,2-tetrafluoroethane (0.02 mg/kg) in food due to the use of extraction solvents in the preparation of flavourings from natural flavouring materials.

   According to Commission Regulation (EU) No 231/2012 of 9 March 2012 laying down specifications for food additives listed in Annexes II and III to Regulation (EC) No 1333/2008 of the European Parliament and of the Council, dichloromethane may be used during the preparation/extraction of certain colors and a maximum residue limit of 10 mg/kg in the food additive (color) have been set.

8. Halogenated solvents (such as vinyl chloride, chloroform, ethylenedichloride, bromodichloromethane, trichloroethene, dibromochloromethane, tetrachloroethene, bromoform) were used in the past in the extraction of olive pomace oils. For that reason, section 5.3 of *Standard for Olive Oils and Olive Pomace Oils* (CODEX STAN 33-1981) contains maximum residual levels for each halogenated solvent (0.1 mg/kg) and for the sum of all halogenated solvents (0.2 mg/kg). Since halogenated solvents are no longer used for the production of olive pomace oil, CODEX STAN 33-1981 was amended in 2013 by introducing a provision in the description of olive pomace oil in Section 2.3 stating that it is obtained by treating olive pomace with solvents other than halogenated solvents. However, the maximum residual levels for halogenated solvents in section 5.3 were retained because CCFO considered there could still be contamination with such substances from other sources.

Conclusion

9. There appears to be no data available on the presence of halogenated solvents in olive oils and olive pomace oils from other sources than the use of extraction solvents. Furthermore no information on potential public health implications resulting from exposure to halogenated solvents in olive oils and olive pomace oils is available. The MLs for halogenated solvents in olive pomace oils were set as residue from the use of these substances as processing aids/extraction solvents in the production of these oils. However, the halogenated solvents are no longer used in the production of olive oils and pomace oils and consequently there appears to be no need and justification to maintain the MLs for presence from other sources than the use of extraction solvents for olive oils and olive pomace oils only.