CODEX ALIMENTARIUS COMMISSION

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World Health Organization

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Agenda Item 5 **CX/CF 18/12/5**

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON CONTAMINANTS IN FOODS

Twelfth Session
Utrecht, The Netherlands, 12 - 16 March 2018

PROPOSED DRAFT AND DRAFT MAXIMUM LEVELS OF LEAD IN SELECTED COMMODITIES IN THE *GENERAL STANDARD FOR CONTAMINANTS AND TOXINS IN FOOD AND FEED* (CXS 193-1995) (AT STEPS 7 AND 4)

(Prepared by the Electronic Working Group led by the United States of America)

Codex members and Observers wishing to submit comments at Steps 6 and 3 on this draft should do so as instructed in CL 2018/1-CF available on the Codex webpage/Circular Letters: http://www.fao.org/fao-who-codexalimentarius/resources/circular-letters/en/.

BACKGROUND

1. The6thSession of the Committee on Contaminants in Foods (March 2012) agreed to establish an electronic Working Group (EWG) led by the United States of America to revise the maximum levels (MLs) for lead in fruit juices, milk and milk products, infant formula, canned fruits and vegetables, fruits, and cereal grains (except buckwheat, cañihua and quinoa) in the *General Standard for Contaminants and Toxins in Food and Feed* (GSCTFF) (CXS 193-1995). The Committee also agreed to consider consolidating the MLs for canned fruit and vegetable products.[1]

2. CCCF07[2] (April 2013) agreed to the following:

   a. To retain the current MLs of 0.02 mg/kg for milks, 0.2 mg/kg for cereals, and 0.05 mg/kg for juices and nectars from berries and other small fruits, ready-to-drink.

   b. To postpone consideration of the proposed draft ML of 0.01 mg/kg for infant formula to CCCF08to allow time for interested countries to submit additional data for analysis, with the understanding that if no additional data were made available, the Committee would consider the proposed lower ML for adoption atCCCF08.

   c. Toadvance a proposed draft ML of 0.03 mg/kg for fruit juices and nectars, ready-to-drink (excluding juices from berries and other small fruits); a proposed draft ML of 0.1 mg/kg for canned fruits, including canned mixed fruits (excluding canned berry and other small fruits); and a proposed draft ML of 0.1 mg/kg for canned vegetables, including canned mixed vegetables (excluding canned brassica vegetables, canned leafy vegetables and canned legume vegetables) to the36thSession of the Codex Alimentarius Commission (July 2013) for adoption at Step 5/8.

3. CAC36 agreed to adopt the MLs for fruit juice and canned fruits and vegetables at Step 5, with the understanding that countries that had intervened to object to adoption at Step 5/8 commit to submit data to the GEMS/Food database[3]within a year, to allow CCCF to further consider the revision of the MLs in 2015 for submission to CAC38.[4]

4. CCCF07 also agreed to reestablish the EWG led by USA to continue with the review of MLs for lead in fruits, vegetables, milk products and infant formula, follow-on formula and formula for special medical purposes forinfants.[5]

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[1] REP12/CF, paras. 126-127
[2] REP13/CF, paras. 37, 39-42 and Appendix II
[3] Global Environment Monitoring System - Food Contamination Monitoring and Assessment Programme, http://www.who.int/foodsafety/areas_work/chemical-risks/gems-food/en
[4] REP13/CAC, para. 79
[5] REP13/CF, paras. 39-40

5. CCCF08 (March2014)agreedtothefollowing:[6]

   a. To forward a draft ML for lead in infant formula and formula for special medical purposes intended for infants and follow-on formula (as consumed) at 0.01 mg/kg for adoption byCAC37 (July 2014) at Step 5/8. TheCommission adopted the ML of 0.01 mg/kg at step 5/8.

   b. Maintain the current MLs in the GSCTFF for assorted (sub)tropical fruits, edible peel; assorted (sub)tropical fruits, inedible peel; citrus fruits; pome fruits; stone fruits; bulb vegetables; leafy vegetables; root and tuber vegetables; and secondary milk products.

   c. Postpone discussion of the proposed ML of 0.1 mg/kg for berries and other small fruits until CCCF09 to allow interested countries to submit new or additional data to GEMS/Food for analysis on the understanding that if no data were made available, the Committee would accept the proposed lower ML for adoption at CCCF09. The Committee noted that the proposed lower ML of 0.1 mg/kg for berries and other small fruits may be acceptable when applied to the occurrence data of this group as a whole; however, when the data are split into the individual species or varieties of berries and small fruits, the proposed reduction may be problematic for some berries such as cranberries, currants, elderberries and strawberry tree.

   d. Postpone discussion of the proposed MLs of 0.1 mg/kg for legume vegetables and brassica vegetables, and 0.05 mg/kg for fruiting vegetables, cucurbits, and fruiting vegetables, other than cucurbits,[7]for further consideration in the EWG and finalization by CCCF09. The Committee noted several comments on the need to collect more occurrence data, in particular,better distribution of data among regions.

6. CCCF09 (March2015)agreedtothefollowing:[8]

   a. To forward draft MLs for fruit juices and nectars (excluding juices exclusively from berries and other small fruits and passion fruit), ready-to-drink, at 0.03 mg/kg; canned fruits (excluding berries and other small fruits) at 0.1 mg/kg; and canned vegetables (excluding canned brassica, leafy and legume vegetables) at 0.1 mg/kg to CAC38 (July 2015) for adoption at Step 8.

   b. To forward draft MLs for berries and other small fruits (excluding cranberry, currant and elderberry) at 0.1 mg/kg; cranberries at 0.2 mg/kg; currant at 0.2 mg/kg; elderberry at 0.2 mg/kg; brassica vegetables at 0.1 mg/kg; legume vegetables at 0.1 mg/kg; fruiting vegetables, cucurbits at 0.05mg/kg; and fruiting vegetables, other than cucurbits at 0.05 mg/kg (excluding fungi and mushrooms) to the 38th Session of the Commission for adoption at Step 5/8.

   c. Torecommend revocation of the following MLs by CAC38: canned grapefruit, canned mandarin oranges, canned mangoes, canned pineapples, canned fruit cocktail, canned tropical fruit salad, canned asparagus, canned carrots, canned mature processed peas, canned mushrooms, canned palmito (palm hearts) and canned sweet corn.

7. CAC38[9] adopted the recommendations (described in paragraph 6 above) of CCCF09.

8. CCCF10 (April 2016) agreed to the following:[10]

   a. To forward the proposed draft revised MLs for fruit juices and nectars, ready-to-drink (inclusion of passion fruit) (ML = 0.03 mg/kg); canned fruits (inclusion of canned berries and other small fruits) (ML = 0.1 mg/kg); canned vegetables (inclusion of canned leafy vegetables and canned legume vegetables) (ML = 0.1 mg/kg); jams, jellies and marmalades (revised ML = 0.1 mg/kg and inclusion of marmalades); pickled cucumbers (revised ML = 0.1 mg/kg); preserved tomatoes (revised ML = 0.05 mg/kg and deletion of the note on the adjustment of the ML to take into account the concentration of the product); and table olives (revised ML = 0.4 mg/kg) for adoption by the 39th Session of the Commission at Step 5/8.

   b. To request revocation of the MLs for lead in the GSCTFF for the following food categories: canned raspberries, canned strawberries, canned green beans and canned wax beans; canned green peas; jams (fruit preserves) and jellies; pickled cucumbers; preserved tomatoes; and table olives.

[6] REP14/CF, paras. 21-24
[7] Excluding fungi and mushrooms
[8] REP15/CF, paras. 48-51
[9] REP15/CAC, Appendices III, V
[10] REP16/CF, paras. 88-90

c. To re-establish the EWG, chaired by USA, working in English only, to continue to work on outstanding issues related to the review of MLs for lead in fruits and vegetables (fresh and processed) and other selected food categories in the GSCTFF, namely review of MLs for fruit juices and nectars that are obtained exclusively from berries and other small fruits; canned brassica vegetables; canned chestnuts and canned chestnuts puree; fungi and mushrooms; mango chutney; processed tomato concentrates and to add two new food categories, i.e., fish and pulses, for consideration by CCCF11.

9. CAC39 (July 2016)[11]adopted the MLs at Step 5/8 as proposed by CCCF with the exception of the MLs for preserved tomatoes and jams, jellies and marmalades, which would be adopted at Step 5 only on the understanding that countries that raised concerns about practicality, number of samples, and geographical representativeness would submit relevant data in order to finalize these MLs at CCCF11 (April 2017).

10. CCCF11 agreed to the following:[12]

a. To forward the proposed draft revised MLsfor preserved tomatoes (ML = 0.05 mg/kg); jams, jellies and marmalades (ML = 0.4 mg/kg); canned chestnuts and canned chestnuts puree (ML = 0.05 mg/kg); and pulses (ML = 0.1 mg/kg) to CAC40 (July 2017) for adoption at Steps 8 and 5/8.

b. To forward the proposed draft revised MLs for processed tomato concentrates(ML = 0.05 mg/kg) and canned brassica vegetables (ML = 0.1 mg/kg) toCAC40 for adoption at Step 5.

c. To retain the current ML of 0.3 mg/kg for fish.

d. To retain the ML of 0.05 mg/kg for juices made exclusively from berries and other small fruits and to work on a positive list of fruits [fruit juices] that could achieve lower levels (e.g., 0.03 or 0.04 mg/kg) as more data became available.

e. To further consider an ML for farmed fungi and mushrooms (i.e., common (*Agaricus*), shiitake and oyster mushrooms) at the next session, rather than establishing a single ML of 0.6 mg/kg for the whole category of fungi and mushrooms (excluding mushroom and fungus products).

f. To request revocation of the MLs for lead in the GSCTFF for the following food categories: preserved tomatoes; jams, jellies and marmalades; canned chestnuts and canned chestnuts puree; and pulses.

g. To re-establish the EWG, chaired by USA, working in English only, to continue to work on outstanding issues related to the review of MLs for lead in fruits and vegetables (fresh and processed) and other selected food categories in the GSCTFF, namely review of MLs for grape juice (to determine if a lower ML could be established as part of the positive list to apply to juices obtained exclusively from berries and other small fruits); processed tomato concentrates; mango chutney; canned brassica vegetables; and fresh farmedmushrooms [common mushrooms (*Agaricus bisporous*), shiitake mushrooms (*Lentinula edodes*) and oyster mushrooms (*Pleurotus*)]; and to review the following new categories, i.e., salt, wine, fat spreads and blended spreads, and edible fats and oils.

11. CAC40 adopted the proposed MLs for lead in selected processed fruits and vegetables as proposed by CCCF.

12. TheUnited States of America, as Chair of the EWG, prepared the paper on proposed revised MLs for lead in grape juice; processed tomato concentrates; mango chutney; canned brassica vegetables; fresh farmedmushrooms [common mushrooms (*Agaricus bisporous*), shiitake mushrooms (*Lentinula edodes*) and oyster mushrooms (*Pleurotus*)]; wine; salt; fat spreads and blended spreads; and edible fats and oils, with the technical assistance of the Secretariat of the Food and Agriculture Organization (FAO)/World Health Organization (WHO) Joint Expert Committee on Food Additives (JECFA).

13. The work process followed for the revision of the MLs and the analysis of the individual foods is provided in Appendix II. Matters raised by some Codex members and observer organizations are described in the additional topics for consideration by the Committee as appropriate.

[11] REP16/CAC, para. 74
[12]REP17/CF, paras. 41-89

14. The list of countries and nongovernmental organizations (NGOs) that joined the EWG can be found in Appendix III. Comments were received from the following countries/NGOs:Chile, China, Brazil, Canada, India, Japan, Spain, Institute of Shortening and Edible Oils, FoodDrinkEurope, World Processing Tomato Council, and International Fruit and Vegetable Juice Association.

SUMMARYANDRECOMMENDATIONS

15. In summary, reanalysis of selected foods supports lowering the MLs for lead for various foods and establishing an ML for certain other foods. The Committee is invited to consider the recommendations presented in Appendix I.

APPENDIX I

RECOMMENDATIONS FOR REVISED AND NEW MAXIMUM LEVELS FOR LEAD IN SEVERAL COMMODITIES IN THE GSCTFF

1. **Grape juice:** Consider lowering the ML for grape juice from 0.05 mg/kg to 0.04 mg/kg.
2. **Processedtomatoconcentrates:** Consider lowering the ML for lead in processed tomato concentrates from 1.5 mg/kg (currently 0.05 mg/kg at Step 5) to 0.08 mg/kg.
3. **Mangochutney:**Consider lowering the ML for lead in mango chutney from 1 mg/kg to 0.3 mg/kg.
4. **Canned brassica vegetables:** Consider including canned brassica vegetables in the canned vegetables category with an ML of 0.1 mg/kg.
5. **Fresh farmed mushrooms:** Consider establishing an ML for fresh farmed mushrooms [common mushrooms (*Agaricus bisporous*), shiitake mushrooms (*Lentinula edodes*), and oyster mushrooms (*Pleurotus*)] of 0.2 mg/kg.
6. **Wine:**Consider lowering the ML for lead in wine from 0.2 mg/kg to 0.05 mg/kg.
7. **Salt:**Consider lowering the ML for lead in salt from 2 mg/kg to 1 mg/kg.
8. **Fat spreads and blended spreads:**Consider lowering the ML for lead in fat spreads and blended spreads from 0.1 mg/kg to 0.04 mg/kg.
9. **Edible fats and oils:**Consider lowering the ML for lead in edible fats and oils from 0.1 mg/kg to 0.07 mg/kg.

FOR INFORMATION ONLY

This table provides explanatory notes on the current MLs for the commodities under consideration and shows how the recommendations abovewouldreflect on the MLs for lead in the GSCTFF if CCCF agrees with the recommendations made by the EWG.

Commodity/Product Name	**Proposed draft and draft MLs(mg/kg) For comments and consideration by CCCF**	**ML in force As adopted by CAC(mg/kg)**	**Portion of the Commodity/Product to which the ML applies**	**Notes/Remarks**
Fruit juices	---	0.03	Whole commodity(notconcentrated) or commodityreconstituted to the original juice concentration,readyto drink. The ML appliesalsoto nectars, readytodrink.	The ML doesnot apply tojuices exclusively from berries and othersmall fruit. RelevantCodex commoditystandard is CXS 247-2005.
Fruit juices obtained exclusively from berries and other small fruits	---	0.05 (To be amended to exclude grape juice by including the note in the notes/remarks)	Whole commodity(notconcentrated) or commodityreconstituted to the original juice concentration,readyto drink. The ML appliesalsoto nectars, readytodrink.	**The ML does not apply to grape juice**(to be added if a separate ML for grape juice is recommended by CCCF) RelevantCodex commoditystandardis CXS 247-2005.
Grape juice	**0.04**	~~0.05~~	Whole commodity(notconcentrated) or commodityreconstituted to the original juice concentration,readyto drink. The ML appliesalsoto nectars, readytodrink.	RelevantCodex commoditystandardis CXS 247-2005.
Processed tomato concentrates	**0.08 As proposed by the EWG 0.05 As proposed by CCCF11 and adopted by CAC40 at Step 5**	~~1.5~~		Relevant Codex commodity standard is CXS 57-1981.
Mango chutney	**0.3**	~~1~~		Relevant Codex commodity standard is CXS 160-1987.
Canned vegetables	---	0.1 (To be amended to include canned brassica vegetables by deleting the note in the notes/remarks)	The ML appliesto the productas consumed.	~~**The ML doesnot apply tocanned brassicavegetables.**~~(to be deleted if CCCF recommends the ML for canned vegetables to cover all canned vegetables including canned brassica vegetables) RelevantCodexcommoditystandardis CXS 297-2009.
Canned brassica vegetables	**0.1 (to be covered by the ML for canned vegetables)**	No ML adopted by CAC	The ML appliesto the productas consumed.	RelevantCodexcommoditystandardis CXS 297-2009.

Commodity/Product Name	Proposed draft and draft MLs(mg/kg) For comments and consideration by CCCF	ML in force As adopted by CAC(mg/kg)	Portion of the Commodity/Product to which the ML applies	Notes/Remarks
Fresh farmed mushrooms [common mushrooms (*Agaricus bisporous*), shiitake mushrooms (*Lentinula edodes*), and oyster mushrooms (*Pleurotus*)]	**0.2**	No ML adopted by CAC		
Wine	**0.05**	~~0.2~~		
Salt, food grade	**1**	~~2~~		Relevant Codex commodity standard is CXS 150-1985.
Fat spreads and blended spreads	**0.04**	~~0.1~~		Relevant Codex commodity standard is CXS 256-2007.
Edible fats and oils	**0.07**	~~0.1~~	Whole commodity as prepared for wholesale or retail distribution.	Relevant Codex commodity standards are CXS 19-1981, CXS 33-1981, CXS 210-1999, CXS 211-1999 and CXS 329-2017

APPENDIX II

SUMMARY REPORT

(For information by Codex Members and Observers when considering the revised proposed MLs)

INTRODUCTION

1. As a reminder, this work was undertaken in response to the new toxicological evaluation of lead in food conducted by JECFA at its 73rd meeting (JECFA73), at the request of CCCF. In the evaluation[1],JECFA stated thatexposure to lead is associated with a wide range of effects, including various neurodevelopmental effects, impaired renal function, hypertension, impaired fertility and adverse pregnancy outcomes. Because of the neurodevelopmental effects, foetuses, infants and children are the subgroups that are most sensitive to lead. JECFA withdrew the previously established provisional tolerable weekly intake (PTWI) of 25 µg/kgbw and concluded that it was not possible to establish a new PTWI that would be considered to be health protective. JECFA also concluded that, in populations with prolonged dietary exposures to higher levels of lead, measures should be taken to identify major contributing sources and foods and, if appropriate, to identify methods of reducing dietary exposure that are commensurate with the level of risk reduction.

2. Sinceno safe level of lead has been identified by JECFA, the focus of the paper was to review occurrence data to determine what percentage of samples can meet proposed new MLs. The paper did not propose MLs based on levels of exposure or on consumption. This approach is consistent with the approach presented previously,[2]as well as with an “as low as reasonably achievable approach” (ALARA) to lead in food in international trade.

WORKPROCESS

3. The Codex Secretariat requested that Codex countries, observers, and EWG members submit data on lead levels in grape juice; processed tomato concentrates; mango chutney; canned brassica vegetables; freshfarmed mushrooms [common mushrooms (*Agaricus bisporous*), shiitake mushrooms (*Lentinula edodes*) and oyster mushrooms (*Pleurotus*)]; wine; salt; fat spreads and blended spreads; and edible fats and oils, preferably from the past 10 years, to the WHO GEMS/Food database. The collection and initial categorization of data were performed by the JECFA Secretariat and the EWG, and based on the GEMS/Food database. Analysis of results and decisions about which data were excluded, how data should be presented, and what recommendations should be included were made by the EWG.

4. For products previously discussed by CCCF (grape juice; processed tomato concentrates; mango chutney;canned brassica vegetables and mushrooms),the EWG extracted data submitted since the extraction for last year’s report, and combined the new data with the dataset used in last year’s report. For the remaining product categories under consideration by CCCF (wine; salt; fat spreads and blended spreads; and edible fats and oils), the EWG extracted data from the GEMS/Food database covering approximately the last 15 years. The first step in analysis of the data was to remove data from the initial extractions that did not meet basic criteria. For example, for processed tomato concentrates, the EWG included tomato paste and purees, and removed tomato sauce and ketchup. This process left us with our raw dataset.

5. The second step was to prepare a second dataset based on the limit of quantitation (LOQ) of the analytical method associated with each sample (LOQ-limited dataset). The EWG found that many results in the raw dataset were obtained with methods with a reported LOQ higher than the Codex ML for that food. Further, some of these samples had results reported as non-detects (NDs). NDs obtained with a method with an LOQ higher than the ML may actually be higher than the ML. Furthermore, methods with an LOQ higher than the ML cannot accurately determine whether a food meets the ML. Therefore, for each food category, the EWG prepared a second dataset excluding all results obtained with a method with an LOQ higher than the ML.This dataset also excluded samples that were entered in the GEMS/Food database without an LOQ, as the EWGbelieved it could not readily evaluate whether these samples met the LOQ criteria.

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[1] JECFA. Evaluation of Certain Food Additives and Contaminants. Seventy-third report of the joint FAO/WHO Expert Committee on Food Additives. WHO Technical Report Series 960.

[2] CX/CF12/6/13, CX/CF13/7/5, CX/CF14/8/5, CX/CF15/9/5, CX/CF 16/10/7

6. The next step in the analysis was to prepare tables showing the percentage of lead level results in the LOQ-limited dataset that meet the current and hypothetical lower MLs and to make recommendations based on those percentages[3]. The EWG attempted to choose a percentage value that would be consistent with current occurrence data and would provide some reduction in lead levels, but without having too significant an impact on international trade. There was no specific rule to identify the appropriate cut-off value, but in general, our approach has been to recommend reductions in MLs when the percentage of excluded samples was less than 5 percent.[4]In cases where the Committee had previously identified MLs for broad groupings (e.g., canned vegetables), but excluded certain subsets (e.g., canned brassica vegetables), the EWG focused on whether data supported extending the previously identified MLs to the subsets that had been excluded by the Committee.

7. In the food categories evaluated this year, large numbers of samples in the initial data collection did not report an LOQ value. Omitting large numbers of results could have affected the EWG analysis. Therefore, we took the following two steps: (1) after review of the first draft, we requested re-entry of datasets with large numbers of non-reported LOQs and re-analyzed each category, and (2) we examined each category to see if retaining samples with no reported LOQ but with results greater than NDs(quantified results)affected the final recommendations. (These samples effectively have LOQs that meet the initial LOQ criteria, even though the LOQs were not reported in the GEMS/Food database[5].) For four food categories (mango chutney, canned brassica vegetables, fresh farmed mushrooms, and wine),this re-examination did notchange the EWG recommendationson MLs and no further analysis is reported. For five categories (grape juice, processed tomato concentrates, salt, fat spreads and blended spreads, and edible fats and oils), the re-examination affected the EWG recommendations on MLs. In these cases, we included additional analysis in the paragraphs below and the tables in the Annexand we made our recommendations based on the sample sets that included the retained samples.

ANALYSIS OF INDIVIDUAL FOODS

Products previously discussed by CCCF

8. **Grape Juice.** As a reminder, at CCCF11, the Committee agreed to retain the ML of 0.05 mg/kg for juices obtained exclusively from berries and small fruits and to work on a positive list of these fruits [fruit juices] that could achieve lower levels (e.g., 0.03 or 0.04 mg/kg) as more data became available. The EWG requested additional data on grape juice to determine if grape juice could achieve lower levels.The 2018 grape juice raw dataset consisted of 1194 results from the GEMS/Food database for samples collected and/or analyzed between 2000 and 2017. The EWG included only samples of grape juice that were either not concentrated or were reconstituted to the original juice concentration (ready-to-drink). We excluded 59samples with an LOQ greater than the current ML of 0.05 mg/kg and 268samples with no reported LOQto obtain the LOQ-limited dataset of 867samples. Table GJ-1 (in the Annex) shows the breakdown by country of the 2018 raw and LOQ-limited datasets. Table GJ-2 shows the mean and maximum lead levels associated with both datasets. Table GJ-3 shows the number and percentage of grape juice samples meeting current and hypothetical MLs.

9. For grape juice, 99 percent of the samples in the 2018 LOQ-limited dataset met the current Codex ML of 0.05 mg/kg (Table GJ-3). The table also indicates that 98 percent of samples may meet a hypothetical ML of 0.04 mg/kg,96 percent of samples may meet a hypothetical ML of 0.03 mg/kg, and 85% of samples may meet a hypothetical ML of 0.02 mg/kg. Thus, lowering the ML to the hypothetical level of 0.04 mg/kg would eliminate 2 percent of the samples in international trade,lowering the ML to the hypothetical level of 0.03 mg/kg would eliminate 4 percent of samples in international trade, and lowering the ML to the hypothetical level of 0.02 mg/kg would eliminate 15 percent of the samples in international trade.

10. However, this analysis excluded a large number of grape juice samples (268 samples; approximately 22 percent) for not providing an LOQ. As explained in paragraph 7, the EWG considered whether retaining these samples would change the recommendation for an ML. As shown in Table GJ-3 (supplemental LOQ-limited dataset), with these 268 samples retained, 97 percent of samples may meet a hypothetical ML of 0.04 mg/kg and 94 percent of samples may meet a hypothetical ML of 0.03 mg/kg. Based on these results, setting an ML at the hypothetical level of 0.04 mg/kg would eliminate 3 percent of the samples in international trade and setting an ML at the hypothetical level of 0.03 mg/kg would eliminate 6 percent of the samples in international trade. Based on this analysis, the EWG recommends that the Committee consider lowering the ML for grape juice to 0.04 mg/kg.

[3]As discussed in previous years, non-detects were treated as zeros in this analysis.

[4] CX/CF12/6/13, CX/CF13/7/5, CX/CF14/8/5, CX/CF15/9/5, CX/CF 16/10/7. In addition, we note that the primary goal was not to attain identical achievability rates across all commodities.

[5]The GEMS/Food database allows submission of quantified results without an LOQ. Nondetect results (nonquantified) require submission of an LOQ.

11. **Processed tomato concentrates**. The 2018 processed tomato concentrates raw dataset consisted of 560 results from the GEMS/Food database for samples collected and/or analyzed between 2006 and 2017. Consistent with the *Standard for Processed Tomato Concentrates* (CXS 57-1981), the dataset includes products described as tomato pastes and purees. Samples described as tomato sauce, tomato powder, and ketchup (catsup) were excluded from analysis. Because the ML of 0.05 mg/kg was adopted at Step 5 only, the EWG evaluated the data at the current ML of 1.5 mg/kg. No LOQs associated with the results exceeded the ML. We excluded 65 samples with no reported LOQ to obtain the LOQ-limited dataset of 495 samples.Table TC-1 (in the Annex) shows the breakdown by country of the 2018 raw and LOQ-limited datasets. Table TC-2 shows the mean and maximum lead levels associated with both datasets. Table TC-3 shows the number and percentage of processed tomato concentrates samples meeting current and hypothetical MLs.

12. For tomato concentrates, 100 percent of the samples in the 2018 LOQ-limited dataset met the current ML of 1.5 mg/kg (Table TC-3). This table also indicates that 97 percent of samples may meet a hypothetical ML of 0.08 mg/kg, 96 percent of samples may meet a hypothetical ML of 0.07 mg/kg, and 92 percent of samples may meet the previously proposed (Step 5) level of 0.05 mg/kg. Thus,lowering the ML to the hypothetical level of 0.08 mg/kg would eliminate 3 percent of the samples in international trade, lowering the ML to the hypothetical level of 0.07 mg/kg would eliminate 4 percent of samples in international trade, and lowering the ML to the previously proposed (Step 5) level of 0.05 mg/kg would eliminate 8 percent of samples in international trade.

13. However, this analysis excluded a large number of processed tomato concentrate samples (65 samples; approximately 12 percent) for not providing an LOQ. As explained in paragraph 7, the EWG considered whether retaining these samples would change the recommendation for an ML. As shown in Table TC-3 (supplemental LOQ-limited dataset), with these 65 samples retained, 96 percent of samples may meet a hypothetical ML of 0.08 mg/kg, 95 percent of samples may meet a hypothetical ML of 0.07 mg/kg, and 91 percent of samples may meet a hypothetical level of 0.05 mg/kg. Based on these results, setting an ML at the hypothetical level of 0.08 mg/kg would eliminate 4 percent of the samples in international trade and setting an ML at the hypothetical level of 0.07 mg/kg would eliminate 5 percent of the samples in international trade. Based on this analysis, the EWG recommends that the Committee consider lowering the ML for processed tomato concentrates to 0.08 mg/kg.

14. At CCCF11, the Committee sent forward an ML of 0.05 mg/kg for processed tomato concentrates at Step 5, pending receipt of additional data for CCCF12. Therefore, the EWG wanted to address the geographical representativeness and sample number of the new dataset. The results reported in 2017 were based on 60 samples in the raw dataset (from Argentina, Brazil, Canada, China, European Union, Singapore, Thailand, and the USA). The 2018 analysis consists of 495samples in the LOQ-limited dataset (from Argentina, Brazil, Canada, Chile, China, Cuba, Greece, Italy, Portugal, Singapore, Spain, Thailand, Turkey, Ukraine, USA, and European Union) and 560 samples in the supplemental LOQ-limited dataset (from Argentina, Brazil, Canada, Chile, China, Cuba, Greece, Italy, Portugal, Singapore, Spain, Thailand, Turkey, Ukraine, USA, and European Union), reflecting an increase in both sample number and geographical distribution.

15. The EWG received several comments on whether the ML of processed tomato concentrates should consider the concentration of processed tomato concentrates compared with tomatoes. We note that the proposed ML is based on actual occurrence data in processed tomato concentrates. In addition, last year, the Committee agreed to delete the note in the GSCTFF on the adjustment of the ML to take into account the concentration of the product. At the same time, Brazil indicated they could provide data on tomato concentrates at different ratio of concentrations because of the possibility that the proposed lower ML did not take into account the effect of the different concentration ratios on the achievability of the ML and therefore some tomato concentrates may not comply with the proposed ML. This year's dataset includes 112 tomato puree results ("extract" and "pulp") that Brazil supplied to GEMS/Food in 2017.

16. **Mango chutney**.The 2018 mango chutney raw dataset consisted of 139 results from the GEMS/Food database for samples collected and/or analyzed between 2006 and 2017. Consistent with the *Standard for Mango Chutney* (CXS 160-1987), the dataset includes products described as mango chutney and excluded one product described as mango jam. No LOQs associated with the results exceeded the current ML of 1 mg/kg; therefore, no further exclusions were made and there is only one dataset for mango chutney. Table MC-1 (in the Annex) shows the breakdown by country of the 2018 raw dataset. Table MC-2 shows the mean and maximum lead levels associated with the dataset. Table MC-3 shows the number and percentage of mango chutney samples meeting current and hypothetical MLs.

17. **For mango** chutney, 100 percent of the samples in the 2018 raw dataset met the current ML of 1 mg/kg

(Table MC-3). This table also indicates that 98 percent of samples may meet a hy*pothetical ML of 0.5 mg/kg*, and 96 percent of samples may meet a hypothetical ML of 0.4 mg/kg or 0.3 mg/kg. Thus, lowering the ML to the hypothetical level of 0.5 mg/kg would eliminate 2 percent of the samples in international trade and lowering the ML to the hypothetical level of 0.4 mg/kg or 0.3 mg/kg would eliminate 4 percent of the samples in international trade. Based on these results, the EWG recommendslowering the ML for lead in mango chutneyto 0.3 mg/kg.

18. At its previous session, CCCF11 agreed to retain the current ML of 1 mg/kg for mango chutney as a stand-alone category and to encourage member countries concerned to submit data to GEMS/Food in order to make a final decision at its next session. Therefore, the EWG wanted to address the geographical representativeness and sample number of the new dataset. The results reported in 2017 were based on 34 samples in the raw dataset (from Canada, China, and the USA). This year's analysis consists of 139 samples in the raw dataset (from Canada, China, India, the USA, and European Union), reflecting an increase in both sample number and geographical distribution.

19. **Canned brassicavegetables**.As a reminder, at CCCF07, the Committee excluded brassica vegetables from the ML of 0.1 mg/kg for canned vegetables stating that the corresponding raw vegetables had higher MLs as shown in the GSTCFF. At CCCF10, the Committee considered extending the ML for canned vegetables (0.1 mg/kg) to the subset of canned brassica vegetables, but noted that current data (5 samples) were not sufficient. A proposal was made to align the ML for the canned products to the ML for the corresponding fresh products, but it was noted that before deriving MLs for processed products from the corresponding fresh produce, it would be preferential to gather additional data for the canned product itself. Subsequently, alternative ways to derive an ML for this subset food category could be explored. The Committee agreed to keep the note excluding canned brassica vegetables from the broad category of canned vegetables pending additional data and to take a decision at CCCF11.

20. At CCCF11, the Committee considered the opportunity to extend the ML of 0.1 mg/kg for canned vegetables to canned brassica vegetables in view of the very limited dataset and to facilitate the enforcement of the ML for this product. The Committee noted support for this approach, however, some questions needed to be further considered by the next session before advancing the ML for final adoption, in particular: (i) to include available data on kale in the dataset to determine whether this would not affect achievability of an ML of 0.1 mg/kg for a single category of canned vegetables (including canned brassica vegetables) and; (ii) to further consider data on canned brassica vegetables as the current analysis was based on pickled brassica and pickled fruits and vegetables which are not included in the same category of canned vegetables. The Codex Secretariat noted that there were two separate standards for canned vegetables (CXS 297-2009) and canned pickled fruits and vegetables (CXS 260-2005) and that the ML for canned vegetables only applied to products covered under the standard for canned vegetables. The Committee agreed to advance an ML of 0.1 mg/kg for canned brassica vegetables to Step 5 and to further consider a single ML for canned vegetables (including canned brassica vegetables) at 0.1 mg/kg at its next session in order to make a final decision.

21. The 2018 canned brassica vegetables raw dataset consisted of 177 results from the GEMS/Food database for samples collected and/or analyzed between 2008 and 2017. Based on the above considerations (paragraphs 19-20), the EWG included canned samples described as brassica vegetables in the Codex Classification of Foods and Animal Feeds (1993)[6] (including cabbage, broccoli, Brussels sprouts, cauliflower, and kohlrabi), as well as kale, a brassica leafy vegetable. We did not exclude canned pickled brassica from the analysis. Because the ML of 0.1 mg/kg was adopted at Step 5 only, the EWG evaluated the data at the current ML of 1 mg/kg. No LOQs associated with the results exceeded the ML. We excluded 72 samples for not providing an LOQ to obtain the LOQ-limited dataset of 105 samples. Table CB-1 (in the Annex) shows the breakdown by country of the 2018 raw and LOQ-limited datasets. Table CB-2 shows the mean and maximum lead levels associated with the datasets.Table CB-3 shows the percentage of canned brassica samples meeting current and hypothetical MLs.

22. For canned brassica vegetables, 100 percent of the samples in the 2018 LOQ-limited dataset met the previous ML of 1 mg/kg for canned vegetables (Table CB-3). This table also indicates that 98 percent of samples would meet the proposed (Step 5) ML for canned brassica vegetablesof 0.1mg/kg. Thus, adopting the proposed ML would eliminate 2 percent of samples in international trade. These results could supportincluding canned brassica vegetables in the broad category of canned vegetables with an ML of 0.1 mg/kg.

23. As noted in paragraphs 19-20, concerns were raised in previous CCCF sessions about the number of samples and inclusion of pickled vegetables and/or leafy brassica (kale). In response, the EWG notes

[6]CXA004_1993

the following: (1) The 2018 raw dataset (177 samples) represents a significant improvement in number of samples over the 2017 dataset (16 samples). (2) As in 2017, most of the samples are canned pickled brassicas. Of the 177 samples, 163 were canned pickled brassica (e.g., sauerkraut), 10 were canned kale, and 4 were canned non-pickled brassica (1 Brussels sprouts, 3 cabbage). (3) Non-pickled canned brassica vegetable samples appear to be relatively uncommon in international trade and it seems unlikely, after three years of sampling, that significant numbers of additional samples will be available in the GEMS/Food database in the near future. (4) Brassica vegetables (raw) have an ML of 0.1 mg/kg in the GSCTFF.

24. Based on the results in paragraph 22and the points raised in paragraph 23, the EWG again recommends confirming the ML currently at Step 5 and including canned brassica vegetables in the category of canned vegetables with an ML of 0.1 mg/kg.

25. **Fresh farmed mushrooms**.As a reminder,the current version of the GSCTFF (CXS 193-1995, 2016 amendment) excludes fungi and mushrooms from the 0.05 mg/kg standard for lead in fruiting vegetables. A previous version (2011 amendment) excluded mushrooms, but not fungi. In 2014 and 2015, at CCCF08 and CCCF09, the EWG excluded all fungi and edible mushrooms from the analysis of fruiting vegetables, other than cucurbits. In 2015, CCCF09 noted that in view of the exclusion of fungi and mushrooms from the ML for fruiting vegetables, other than cucurbits, MLs for these commodities would be considered by the EWG. In 2016, CCCF10 agreed to consider setting MLs for mushrooms and different species/group of species of fungi if appropriate and feasible at CCCF11. In 2017, CCCF11 agreed to further consider an ML for farmed fresh mushrooms (i.e., common (*Agaricus*), shiitake, and oyster mushrooms) at its next session.

26. The 2018 fresh farmed mushroom raw dataset consisted of 5834 results from the GEMS/Food database for samples collected and/or analyzed between 1998 and 2017. As requested atCCCF11, the dataset consists of samples specifically identified as fresh button (*Agaricus bisporous*), shiitake (*Lentinula edodes*) and oyster (*Pleurotus*) mushrooms. Consistent with the discussion at CCCF11, we assumed that all fresh mushroom samples of these species were farmed. Samples with no species/variety identified (1840 samples, e.g., samples identified only as “mushroom”) were excluded from the analysis. The EWG did not prepare an LOQ-limited set based on ML, since there is no existing ML for fungi and mushrooms.[7]However, the EWG excluded 427 products with no reported LOQ to obtain the 2018 LOQ-limited dataset of 5407 samples. Table FM-1 (in the Annex) shows the breakdown by country of the 2018 raw and LOQ-limited datasets for fresh farmed mushrooms. Table FM-2 shows the mean and maximum lead levels associated with the datasets. Table FM-3 shows the percentage of fresh farmed mushroom samples meeting hypothetical MLs.

27. For fresh farmed mushrooms, 100 percent of samples in the 2018 LOQ-limited dataset may meet a hypothetical ML of 0.5 mg/kg, 98 percent of samples may meet a hypothetical ML of 0.3 mg/kg, 96 percent of samples may meet a hypothetical ML of 0.2 mg/kg, and 89 percent may meet a hypothetical ML of 0.1 mg/kg. Based on these results, setting an ML at the hypothetical level of 0.5 mg/kg would eliminate 0 percent of the samples in international trade, setting an ML at the hypothetical level of 0.3 mg/kg would eliminate 2 percent of the samples in international trade, setting an ML at the hypothetical level of 0.2 mg/kg would eliminate 4 percent of the samples in international trade, and setting an ML at the hypothetical level of 0.1 mg/kg would eliminate 11 percent of samples in international trade.Therefore, the EWG recommends that the Committee consider establishing an ML for lead in fresh farmed mushrooms [common mushrooms (*Agaricus bisporous*), shiitake mushrooms (*Lentinula edodes*), and oyster mushrooms (*Pleurotus*)] of 0.2 mg/kg.

<u>New product categories under consideration by CCCF</u>

28. **Wine**. The 2018 wine raw dataset consisted of 10183 results from the GEMS/Food database for samples collected and/or analyzed between 2000 and 2017. The dataset includes wine products made exclusively from grapes as well as wines made from grapes and other fruits, honey wine (mead), fortified wines (port, vermouth), dessert wines (ice wine), and cooking wines. Products described as rice wines (sake), wine coolers, alcopop, and vinegar were excluded. We excluded 98 samples with an LOQ greater than the current ML of 0.2 mg/kg and 743 samples with no reported LOQ to obtain the LOQ-limited dataset of 9342samples. Table WI-1 (in the Annex) shows the breakdown by country of the 2018 raw and LOQ-limited datasets. Table WI-2 shows the mean and maximum lead levels associated with the datasets. Table WI-3 shows the number and percentage of wine samples meeting current and hypothetical MLs.

29. For wine, 100 percent of samples in the 2018 LOQ-limited dataset met the current ML of 0.2 mg/kg. In addition, 99 percent of samples in the 2018 LOQ-limited dataset may meet a hypothetical ML of 0.1

[7] CX/CF16/10/7, par. 51

mg/kg; 97percent of samples may meet a hypothetical ML of 0.05 mg/kg; and 95 percent of samples may meet a hypothetical ML of 0.04 mg/kg. Thus, setting an ML at the hypothetical level of 0.1 mg/kg would eliminate 1 percent of the samples in international trade, setting an ML at the hypothetical level of 0.05 mg/kg would eliminate 3percent of the samples in international trade, and setting an ML at the hypothetical level of 0.04 mg/kg would eliminate 5 percent of the samples in international trade. Therefore, the EWG recommends that the Committee consider lowering the ML for lead in wine to 0.05 mg/kg.

30. **Salt.** The 2018 salt raw dataset consisted of 480 results from the GEMS/Food database for samples collected and/or analyzed between 2004 and 2017. Consistent with the *Standard for Food Grade Salt* (CXS 150-1985), the dataset includes salt used as an ingredient of food, both for direct sale to the consumer and for food manufacture, including carriers such as fluoride and nitrate. Samples described as low sodium or salt mixes were excluded from the analysis. We excluded 2 samples with an LOQ greater than the current ML of 2 mg/kg and 114 samples with no reported LOQ to obtain the LOQ-limited dataset of 364samples. Table SA-1 (in the Annex) shows the breakdown by country of the 2018 raw and LOQ-limited datasets. Table SA-2 shows the mean and maximum lead levels associated with the datasets. Table SA-3 shows the number and percentage of salt samples meeting current and hypothetical MLs.

31. For salt, 100percent of samples in the 2018 LOQ-limited dataset met the current ML of 2 mg/kg. In addition, 99 percent of the samples may meet a hypothetical ML of 0.9 mg/kg or 0.8 mg/kg, 98 percent of samples may meet a hypothetical ML of 0.6 mg/kg, and 93 percent of samples may meet a hypothetical ML of 0.4 mg/kg. Based on these results, setting an ML at the hypothetical level of 0.8 mg/kg would eliminate 1 percent of the samples in international trade, setting an ML at the hypothetical level of 0.6 mg/kg would eliminate 2 percent of the samples in international trade, and setting an ML at the hypothetical level of 0.4 mg/kg would eliminate 7 percent of the samples in international trade.

32. However, this analysis excluded a large number of salt samples (114 samples; approximately24percent) for not providing an LOQ. As explained in paragraph 7, the EWG considered whether retaining these samples would change the recommendation for anML. As shown in Table SA-3 (supplemental LOQ-limited dataset), with these 114samples retained, 96 percent of samples may meet a hypothetical ML of 1 mg/kg and95percent of samples may meet a hypothetical ML of 0.9 mg/kg.Based on these results, setting an ML at the hypothetical level of 1 mg/kg would eliminate 4 percent of the samples in international trade and setting an ML at the hypothetical level of 0.9 mg/kg would eliminate 5 percent of the samples in international trade. Based on this analysis, the EWG recommends that the Committee consider lowering the ML for lead in salt to 1 mg/kg.

33. **Fat spreads and blended spreads.** The 2018 fat spreads and blended spreads raw dataset consisted of 542 results from the GEMS/Food database for samples collected and/or analyzed between 1998 and 2017. Consistent with CXS 256-2007, the dataset includes margarine and similar products intended primarily for use as spreads and excludes products made exclusively from milk and those that are composed of 100% fat. Products such as butter, lard, and nut butters were excluded. We excluded 87 samples with an LOQ greater than the current ML of 0.1 mg/kg and 24 samples with no reported LOQ to obtain the LOQ-limited dataset of 431 samples. Table FS-1 (in the Annex) shows the breakdown by country of the 2018 raw and LOQ-limited datasets. Table FS-2 shows the mean and maximum lead levels associated with the datasets. Table FS-3 shows the number and percentage of fat spreads and blended spreads samples meeting current and hypothetical MLs.

34. For fat spreads and blended spreads, 100 percent of samples in the 2018 LOQ-limited dataset meet the current ML of 0.1 mg/kg. In addition, 97 percent of samples in the 2018 LOQ-limited dataset may meet a hypothetical ML of 0.04 mg/kg, 96 percent of samples may meet a hypothetical ML of 0.03 mg/kg, and 94 percent of samples may meet a hypothetical ML of 0.02 mg/kg. Based on this analysis, setting an ML at the hypothetical level of 0.04 mg/kg would eliminate 3 percent of the samples in international trade, setting an ML at the hypothetical level of 0.03 mg/kg would eliminate 4 percent of the samples in international trade, and setting an ML at the hypothetical level of 0.02 mg/kg would eliminate 6 percent of the samples in international trade.

35. However, this analysis excluded some fat spreads and blended spreads samples (24 samples; approximately 4 percent) for not providing an LOQ. As explained in paragraph 7, the EWG considered whether retaining these samples would change the recommendation for an ML. As shown in Table FS-3 (supplemental LOQ-limited dataset), with these 24 samples retained, 97 percent of samples may meet a hypothetical ML of 0.05 mg/kg, 96 percent of samples may meet a hypothetical ML of 0.04 mg/kg, and 94 percent of samples may meet an ML of 0.03 mg/kg. Based on these results, setting an ML at the hypothetical level of 0.05 mg/kg would eliminate 3 percent of the samples in international trade, setting an ML at the hypothetical level of 0.04 mg/kg would eliminate 4 percent of the samples in international trade, and setting an ML at the hypothetical level of 0.03 mg/kg would eliminate 6 percent of samples in international trade. Based on this analysis, the EWG recommends that the Committee consider lowering the ML for lead in fat spreads and blended spreads to 0.04 mg/kg.

36. **Edible fats and oils.** The 2018 edible fats and oils raw dataset consisted of 4857 results from the GEMS/Food database for samples collected and/or analyzed between 1998 and 2017. The dataset includes fats, oils, and mixtures thereof consistent with CXS 19-1981, CXS 33-1981, CXS 210-1999, CXS 211-1999, and CXS 329-2017. Products described as mayonnaise, salad dressings, and nut butters were excluded. We excluded 1551 samples with an LOQ greater than the current ML of 0.1 mg/kg and 647 samples with no reported LOQ to obtain the LOQ-limited dataset of 2659 samples. Table EF-1 (in the Annex) shows the breakdown by country of the 2018 raw and LOQ-limited datasets. Table EF-2 shows the mean and maximum lead levels associated with the datasets. Table EF-3 shows the number and percentage of edible fats and oils samples meeting current and hypothetical MLs.

37. For edible fats and oils, 99 percent of samples in the 2018 LOQ-limited dataset met the current ML of 0.1 mg/kg. In addition, 98 percent of samples may meet a hypothetical ML of 0.08 mg/kg or 0.07 mg/kg, 97 percent of samples may meet a hypothetical ML of 0.06 mg/kg, and 95 percent of samples may meet a hypothetical ML of 0.04 mg/kg. Based on these results, setting an ML at the hypothetical level of 0.08 mg/kg or 0.07 mg/kg would eliminate 2 percent of the samples in international trade, setting an ML at the hypothetical level of 0.06 mg/kg would eliminate 3 percent of the samples in international trade, and setting an ML at the hypothetical level of 0.04mg/kg would eliminate 5 percent of samples in international trade.

38. However, this analysis excluded some edible fats and oils samples (647 samples; approximately 13 percent) for not providing an LOQ. As explained in paragraph 7, the EWG considered whether retaining these samples would change the recommendation for an ML. As shown in Table EF-3 (supplemental LOQ-limited dataset), with these 647 samples retained, 97 percent of samples may meet a hypothetical ML of 0.08 mg/kg, 96 percent of samples may meet a hypothetical ML of 0.07 mg/kg, and 95 percent of samples may meet an ML of 0.06 mg/kg. Based on these results, setting an ML at the hypothetical level of 0.08 mg/kg would eliminate 3 percent of the samples in international trade, setting an ML at the hypothetical level of 0.07 mg/kg would eliminate 4 percent of the samples in international trade, and setting an ML at the hypothetical level of 0.06 mg/kg would eliminate 5 percent of samples in international trade. Therefore, the EWG recommends that the Committee consider lowering the ML for edible fats and oils to 0.07 mg/kg.

ADDITIONAL TOPICS

39. On the issue of wine, several countries noted that because wines are not produced with the intention of being consumed by infants and young children, and are not as frequently consumed as non-alcoholic drinks, a low ML (e.g., 0.05 mg/kg) may be unnecessary.

PROPOSEDDRAFTREVISIONOFMAXIMUMLEVELSFORLEAD INSELECTEDFRUITSANDVEGETABLES(FRESHANDPROCESSED)INTHE*GENERALSTANDARDFOR CONTAMINANTSANDTOXINSINFOODANDFEED*(CXS 193-1995)

(PreparedbytheElectronicWorkingGroup chairedbytheUnitedStates ofAmerica)

Annex:Tables

Table GJ-1: Grape juice: Data contribution by country to 2018 raw and LOQ-limited datasets

Country	Raw dataset	LOQ-limited dataset
Austria	37	5
Belgium	110	110
Canada	93	48
France	9	5
Germany	26	2
Hungary	1	1
India	3	2
Italy	327	283
Japan	31	31
Poland	2	2
Romania	2	2
Singapore	7	0
Slovakia	1	1
Spain	1	0
Thailand	8	8
USA	168	167
European Union	368	200
Grand Total	**1194**	**867**

Table GJ-2: Grape juice: Mean and maximum for 2018 raw and LOQ-limited datasets

Dataset	Mean	Maximum
Raw dataset	0.012	0.206
LOQ-limited dataset	0.011	0.206

Table GJ-3: Percentage of grape juice samples meeting current andhypothetical MLs: LOQ-limited and Supplemental LOQ-limited datasets

Current and hypothetical MLs (mg/kg)	Samples ≤ MLs			
	LOQ-limited dataset		Supplemental LOQ-limited dataset	
	Number	Percentage	Number	Percentage
0.05	854	99%	1111	98%
*0.04**	847	98%	1097	97%
0.03	835	96%	1072	94%
0.02	739	85%	933	82%

*HypotheticalMLsshowninitalics

Table TC-1: Processed tomato concentrates: Data contribution by country to 2018 raw and LOQ-limited datasets

Country	Raw dataset	LOQ-limited dataset
Argentina	1	1
Brazil	118	118
Canada	11	11
Chile	31	31
China	15	15
Cuba	3	3
Greece	8	8
Italy	35	33
Portugal	5	5
Singapore	6	6
Spain	29	29
Thailand	28	28
Turkey	46	46
Ukraine	2	2
USA	51	51
European Union	171	108
Grand Total	**560**	**495**

Table TC-2: Processed tomato concentrates: Mean and maximum for 2018 raw and LOQ-limited datasets

Dataset	Mean	Maximum
Raw dataset	0.018	0.860
LOQ-limited dataset	0.017	0.860

Table TC-3: Percentage of processed tomato concentrates samples meeting current andhypothetical MLs: LOQ-limited and Supplemental LOQ-limited datasets

Current and hypothetical MLs (mg/kg)	Samples ≤ MLs			
	LOQ-limited dataset		Supplemental LOQ-limited dataset	
	Number	Percentage	Number	Percentage
1.5	495	100%	560	100%
*0.08**	478	97%	536	96%
0.07	475	96%	533	95%
0.05	457	92%	510	91%

*HypotheticalMLsshowninitalics

Table MC-1: Mango chutney: Data contribution by country to 2018 raw dataset

Country	Raw Dataset
Canada	1
China	3
India	103
USA	30
European Union	2
Grand Total	**139**

Table MC-2: Mango chutney: Mean and maximum for 2018 rawdataset

Dataset	Mean	Maximum
Raw dataset	0.068	0.760

Table MC-3: Percentage of mango chutney samples meeting current and hypothetical MLs: Raw dataset

Current and hypothetical MLs (mg/kg)	Samples ≤ MLs	
	Number	Percentage
1	139	100%
*0.5**	136	98%
0.4	134	96%
0.3	133	96%
0.2	125	90%

*HypotheticalMLsshowninitalics

Table CB-1: Canned brassica vegetables: Data contribution by country to 2018 raw and LOQ-limited datasets

Country	Raw dataset	LOQ-limited dataset
Canada	7	7
Italy	9	0
Japan	1	1
Thailand	3	3
USA	18	18
European Union	139	76
Grand Total	**177**	**105**

Table CB-2: Canned brassica vegetables: Mean and maximum for 2018 raw and LOQ-limited datasets

Dataset	Mean	Maximum
Raw dataset	0.02	0.5
LOQ-limited dataset	0.02	0.5

Table CB-3: Percentage of canned brassica vegetables samples meeting current and hypothetical MLs: LOQ-limited dataset

Current and hypothetical MLs (mg/kg)	Samples ≤ MLs	
	Number	Percentage
1	105	100%
*0.1**	103	98%

*HypotheticalMLsshowninitalics

Table FM-1: Fresh farmed mushrooms: Data contribution by country to 2018 raw and LOQ-limited datasets

Country	Raw dataset	LOQ-limited dataset
Australia	21	21
Canada	20	20
China	2934	2934
India	10	10
Japan	103	103
Singapore	5	5
Thailand	52	52
United States of America	107	107
European Union	2582	2155
Grand Total	**5834**	**5407**

Table FM-2: Fresh farmed mushrooms: Mean and maximum for 2018 raw and LOQ-limited datasets

Dataset	Mean	Maximum
Raw dataset	0.039	0.58
LOQ-limited dataset	0.039	0.58

Table FM-3: Percentage of fresh farmed mushroom samples meeting hypothetical MLs:LOQ-limited dataset

Current and hypothetical MLs (mg/kg)	Samples ≤ MLs	
	Number	Percentage
*0.5**	5387	100%
0.3	5303	98%
0.2	5169	96%
0.1	4826	89%

*HypotheticalMLsshowninitalics

Table WI-1: Wine: Data contribution by country to 2018 raw and LOQ-limited datasets

Country	Raw dataset	LOQ-limited dataset
Australia	37	37
Belgium	6	6
Canada	5972	5972
France	4	4
Hong Kong	4	4
New Zealand	16	16
Singapore	51	10
Thailand	9	9
USA	767	767
European Union	3317	2517
Grand Total	**10183**	**9342**

Table WI-2: Wine: Mean and maximum for 2018 raw and LOQ-limited datasets

Dataset	Mean	Maximum
Raw dataset	0.013	0.584
LOQ-limited dataset	0.012	0.584

Table WI-3: Percentage of wine samples meeting hypothetical MLs:LOQ-limited dataset

Current and hypothetical MLs (mg/kg)	Samples ≤ MLs	
	Number	Percentage
0.2	9334	100%
*0.1**	9238	99%
0.05	9029	97%
0.04	8889	95%

*HypotheticalMLsshowninitalics

Table SA-1: Salt: Data contribution by country to 2018 raw and LOQ-limited datasets

Country	Raw dataset	LOQ-limited dataset
Canada	2	2
China	4	4
Singapore	12	12
Thailand	116	116
USA	14	14
European Union	332	216
Grand Total	**480**	**364**

Table SA-2: Salt: Mean and maximum for 2018 raw and LOQ-limited datasets

Dataset	Mean	Maximum
Raw dataset	0.168	3.390
LOQ-limited dataset	0.078	2.813

Table SA-3: Percentage of salt samples meeting hypothetical MLs:LOQ-limited and Supplemental LOQ-limited datasets

Current and hypothetical MLs (mg/kg)	Samples ≤ MLs			
	LOQ-limited dataset		Supplemental LOQ-limited dataset	
	Number	Percentage	Number	Percentage
2	363	100%	476	100%
*1.5**	362	100%	470	98%
1	360	99%	460	96%
0.9	360	99%	455	95%
0.8	359	99%	452	95%
0.6	357	98%	445	93%
0.4	337	93%	409	86%

*HypotheticalMLsshowninitalics

Table FS-1: Fat spreads and blended spreads: Data contribution by country to 2018 raw and LOQ-limited datasets

Country	Raw dataset	LOQ-limited dataset
Australia	41	41
Canada	2	2
France	4	4
New Zealand	9	9
Singapore	8	0
Thailand	18	18
USA	72	72
European Union	388	285
Grand Total	**542**	**431**

Table FS-2: Fat spreads and blended spreads: Mean and maximum for 2018 raw and LOQ-limited datasets

Dataset	Mean	Maximum
Raw dataset	0.004	0.18
LOQ-limited dataset	0.004	0.18

Table FS-3: Percentage of fat spreads and blended spreads samples meeting hypothetical MLs:LOQ-limited and Supplemental LOQ-limited datasets

Current and hypothetical MLs (mg/kg)	Samples ≤ MLs			
	LOQ-limited dataset		Supplemental LOQ-limited dataset	
	Number	Percentage	Number	Percentage
0.1	430	100%	454	100%
*0.05**	420	97%	440	97%
0.04	419	97%	436	96%
0.03	413	96%	429	94%
0.02	405	94%	416	91%

*HypotheticalMLsshowninitalics

Table EF-1: Edible fats and oils: Data contribution by country to 2018 raw and LOQ-limited datasets

Country	Raw dataset	LOQ-limited dataset
Argentina	1	1
Australia	15	15
Belgium	11	11
Canada	280	274
France	23	23
China	8	8
Hungary	1	1
Japan	17	17
New Zealand	18	18
Singapore	1356	17
Slovakia	42	42
Thailand	300	294
USA	217	217
Uruguay	1	1
European Union	2567	1720
Grand Total	**4857**	**2659**

Table EF-2: Edible fats and oils: Mean and maximum for 2018 raw and LOQ-limited datasets

Dataset	Mean	Maximum
Raw dataset	0.016	1.620
LOQ-limited dataset	0.007	0.385

Table EF-3: Percentage of edible fats and oils samples meeting hypothetical MLs:LOQ-limited and Supplemental LOQ-limited datasets

Current and hypothetical MLs (mg/kg)	Samples ≤ MLs			
	LOQ-limited dataset		Supplemental LOQ-limited dataset	
	Number	Percentage	Number	Percentage
0.1	2633	99%	3267	99%
*0.08**	2613	98%	3213	97%
0.07	2596	98%	3171	96%
0.06	2583	97%	3135	95%
0.04	2533	95%	3015	91%

*HypotheticalMLsshowninitalics

APPENDIX III

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