Consultation Document

# Proposed Amendments to the Food Adulteration (Metallic Contamination) Regulations

June 2017

食物及衞生局
Food and Health Bureau

食物環境衞生署
Food and Environmental Hygiene Department

食物安全中心
Centre for Food Safety

# Consultation Document

# Proposed Amendments to the Food Adulteration (Metallic Contamination) Regulations

Food and Health Bureau
Food and Environmental Hygiene Department
Centre for Food Safety
June 2017

**Abbreviations**

| | |
|---|---|
| 1st HKTDS | The First Hong Kong Total Diet Study |
| ACFEH | Advisory Council on Food and Environmental Hygiene |
| ALARA | As low as reasonably achievable |
| CFS | Centre for Food Safety |
| Codex | Codex Alimentarius Commission |
| EU | European Union |
| FAO | Food and Agriculture Organization of the United Nations |
| FEHD | Food and Environmental Hygiene Department |
| FHB | Food and Health Bureau |
| GL | Guideline level |
| GSCTFF | General Standard for Contaminants and Toxins in Food and Feed (published by the Codex Alimentarius Commission) |
| HBGV | Health-based guidance value |
| JECFA | Joint FAO / WHO Expert Committee on Food Additives |
| ML | Maximum level |
| TDS | Total diet study |
| The Ordinance | Public Health and Municipal Services Ordinance (Cap. 132) |
| The Expert Committee | Expert Committee on Food Safety |
| The Regulations | Food Adulteration (Metallic Contamination) Regulations (Cap. 132V) |
| The USA | The United States of America |
| The Working Group | Working Group on Amendments to Food Adulteration (Metallic Contamination) Regulations |
| WHO | World Health Organization |

## CONTENTS

## Chapter 1 Introduction

1.1 Metals are naturally present and ubiquitous in the environment. Sources of human exposure to metallic contaminants are multifarious. Tobacco smoking, use of leaded petrol in vehicles, dental fillings, occupational exposure, consumption of food and use of herbal medicines are reported to be the possible sources of human exposure to metallic contaminants.

1.2 Metallic contaminants may enter the food supply chain through environmental contamination or during food production process. They may be present in food in trace amount.

1.3 Among the 10 chemicals of major public health concern identified by the World Health Organization (WHO)[1], 4 of them are metals, namely arsenic, cadmium, lead and mercury. For ordinary adults, diet is one of the important sources of exposure to these metallic contaminants.

1.4 Excessive dietary exposure to metallic contaminants may lead to chronic toxicity and cause adverse health effects, since metallic contaminants may accumulate in the body. Acute poisoning from metallic contaminants is rare and happens more likely through non-food route.

1.5 The adverse health effects posed by metallic contaminants in food depend on the chemical nature, as well as the amount and duration of individual exposure, etc. International food safety authorities such as the Joint Food and Agriculture Organization of the United Nations (FAO) / WHO Expert Committee on Food Additives (JECFA) have conducted extensive evaluations on the adverse health effects of various metallic contaminants.

[1] World Health Organization. Ten chemicals of major public health concern. Available from URL: http://www.who.int/ipcs/assessment/public_health/chemicals_phc/en/

1.6 Global-wise, a multi-pronged approach is adopted to prevent excessive intake of metallic contaminants from food. To control the problem at source, best practices such as Good Agricultural Practice and Good Manufacturing Practice are in place to control the metallic contaminant levels in food as low as reasonably achievable (ALARA). Regulatory measures such as the establishment of statutory control over the types and levels of metallic contamination in food are adopted in most jurisdictions, including Hong Kong. Also, competent authorities of individual jurisdictions provide dietary advice to their people, particularly to susceptible groups of the population[2].

[2] Taking mercury in fish as an example, the Joint FAO / WHO Expert Consultation on the Risks and Benefits of Fish Consumption concluded that there are both risks and benefits in consuming fish. In order to lower the risk and maximise the benefit from fish consumption, competent authorities of various jurisdictions (e.g. Australia, Canada, the European Union (EU), Japan, the United States of America (USA), etc.) as well as the Centre for Food Safety (CFS) have implemented risk management measures of setting MLs for methylmercury or total mercury in fish and / or given advice on fish consumption to consumers, particularly women of childbearing age and young children (see paragraph 5 of **Annex II**).

## Chapter 2 Situation in Hong Kong

### Existing regulatory control on levels of metallic contamination in food

2.1 The food safety laws of Hong Kong are mainly laid down in Part V of the Public Health and Municipal Services Ordinance (Cap. 132) (the Ordinance). The provisions in the Ordinance cover general protection for food purchasers, offences in connection with the sale of food which are not fit for human consumption and adulterated food, etc. The Food Adulteration (Metallic Contamination) Regulations (Cap. 132V) (the Regulations) focus on regulating metallic contamination in food.

2.2 Specifically, the Ordinance and the Regulations control the levels of metallic contamination in food in the following way:-

(a) Section 54 of the Ordinance stipulates that all food for sale must be fit for human consumption;

(b) Regulation 3 of the Regulations prohibits the import, consignment, delivery, manufacture or sale, for human consumption, of any food containing any metal in such amount as to be dangerous or prejudicial to health; and

(c) the First and Second Schedules to the Regulations stipulate 19 maximum permitted concentrations[3] of 7 metallic contaminants, namely arsenic, antimony, cadmium, chromium, lead, mercury and tin, in food. Amongst the 19 existing maximum permitted concentrations, the corresponding food categories of 4 metallic contaminants (namely arsenic, lead, mercury and tin) cover "all food in solid / liquid form" (**Annex I**).

[3] "Maximum permitted concentrations" under the Regulations are known as "maximum levels" (MLs) under Codex Alimentarius Commission (Codex). We will use the term ML when we amend the Regulations as proposed in order to align with the Codex terminology.

## Monitoring metallic contamination in food

2.3 CFS of the Food and Environmental Hygiene Department (FEHD) completed the First Hong Kong Total Diet Study (1st HKTDS) on inorganic arsenic[4] in 2012 and the 1st HKTDS on other metallic contaminants[5] in 2013. The two aforementioned studies estimated the dietary exposure of the local population to metallic contaminants including inorganic arsenic, antimony, cadmium, lead, methylmercury and tin etc., and assessed the associated health risks. The results showed, among other things, that:-

(a) the dietary exposures of average and high consumers of the local population to individual metallic contaminants were all below the respective health-based guidance values (HBGVs)[6] or reference end-points, and therefore was unlikely to pose any health risks;

(b) the dietary exposure to methylmercury[7] of about 11% of average women aged 20-49 of the local population, however, exceeded the relevant HBGV and methylmercury exposure during pregnancy is a public health concern;

(c) the main dietary source of inorganic arsenic for the average consumers of the local population was "cereals and their products", which contributed to 53.5% of the total exposure;

---

4 FEHD. The First Hong Kong Total Diet Study: Inorganic arsenic. Hong Kong; FEHD; 2012. Available from URL: http://www.cfs.gov.hk/english/programme/programme_firm/programme_tds_1st_HKTDS_report2_Inorganic_Arsenic.html

5 FEHD. The First Hong Kong Total Diet Study: Metallic Contaminants. Hong Kong; FEHD; 2013. Available from URL: http://www.cfs.gov.hk/english/programme/programme_firm/programme_tds_1st_HKTDS_report5_Metallic_Contaminants.html

6 HBGV is an estimate of the amount of a chemical that can be ingested over a defined time period (e.g. 24 hours or lifetime) without any appreciable health risks. For example, acute reference dose, acceptable daily intake, provisional tolerable monthly intake, etc.

7 Methylmercury is the major form of mercury in fish and is more toxic than inorganic mercury. Fish is the major dietary source of methylmercury exposure in human.

(d) the main dietary source of cadmium for the average consumers of the local population was "vegetables and their products", "fish and seafood and their products" and "cereals and their products" which contributed to 36%, 26% and 21% of the total exposure respectively; and

(e) the main dietary source of lead for the average consumers of the local population was "vegetables and their products", which contributed to 30% of the total exposure.

2.4 CFS conducts a routine food surveillance programme and regularly takes food samples at import, wholesale and retail levels for various food safety testing (e.g. microbiological, chemical and radiation testing), including the testing of metallic contaminants. For the period from January 2014 to December 2016, among the food samples tested under CFS' food surveillance programme, the unsatisfactory cases concerning metallic contaminations accounted for 0.01-0.03% of the total samples tested:-

| | **Number of samples tested in CFS' food surveillance programme** | **Number of unsatisfactory samples** | **Number of unsatisfactory samples concerning metallic contaminations (% of the total number of samples tested)** |
|---|---|---|---|
| 2014 | 64 100 | 139 | 8 (0.01%) |
| 2015 | 64 300 | 195 | 10 (0.02%) |
| 2016 | 65 500 | 152 | 17 (0.03%) |

**Regulatory responses to unsatisfactory samples**

2.5 In case there is an unsatisfactory result (such as breaching of a maximum permitted concentration), CFS takes the following risk assessment, management and communication work.

***Risk assessment***

2.6 Upon receipt of an unsatisfactory result of a food sample, CFS takes investigation and enforcement actions as required under the law.

2.7 For metallic contaminants in food which do not have a maximum permitted concentration, CFS conducts risk assessment of the test result based on local food consumption data to determine whether the consumption of the food concerned may be dangerous or prejudicial to health. If the food is considered unfit for human consumption, enforcement actions commensurate with the results of risk assessment would be considered.

***Risk management***

2.8 CFS takes follow-up action on the unsatisfactory samples, including informing the vendors concerned of the test results, instructing them to stop selling the affected food items and tracing the sources of the food items in question.

***Risk communication***

2.9 Timely and effective communication of food surveillance results to the public and the trade is critical to the effective functioning of the food surveillance programme, as this can enable the public and the trade to take necessary safeguarding actions to reduce the risks. CFS attaches great importance to its risk communication work and has put in place the following established announcement mechanism to facilitate the communication with the

public, media and trade:-

(a) CFS releases a monthly Food Safety Report that summarises all food surveillance results of the previous month. Also, CFS conducts surveys on targeted food, popular food and seasonal food. If test results indicate that a food sample poses immediate risks to public health or is related to issues of public concern, CFS issues press releases immediately to explain the risks involved and advise the public against consuming the food concerned;

(b) apart from announcement through press releases, the food surveillance results are uploaded onto the CFS' Facebook page. Also, CFS gives advice to consumers on measures to reduce health risks posed by the problem food; and

(c) when there is a product recall, CFS issues Rapid Alerts to trade and Food Alerts to public to inform them about the product recall, and to advise the public to refrain from consuming the affected products.

## Chapter 3 The Need to Update the Regulations

3.1 The Regulations were enacted in 1960. The latest major amendments to the First and Second Schedules to the Regulations, which stipulate the maximum permitted concentrations of metallic contaminations, were made in 1983[8].

3.2 Over the years, Codex Alimentarius Commission (Codex)[9] has revised its standards on metallic contamination[10] in view of the advancement of science and the outcome of the risk assessment. Also, various other jurisdictions have revised their standards on metallic contamination taking into account the evolving Codex standards, the occurrence data of metallic contamination in foods and the food consumption patterns / dietary practices of their own economies, as well as their risk assessment results etc.

3.3 All along, CFS keeps abreast of international development, including both the revision of standards by Codex and other jurisdictions as well as their experience in implementing the revised standards. Apart from total diet study (TDS) as mentioned in paragraph 2.3, CFS also conducts risk assessment studies on individual metallic contamination in food (such as mercury in fish) as well as the dietary exposure of population subgroup to metallic contamination in food (such as secondary school students). CFS takes surveillance and enforcement actions under the Ordinance and the Regulations, regardless of whether there are maximum permitted concentrations for individual food / food groups. In addition, CFS publishes consumer advisory and risk communication messages to enhance transparency of information and public education (see paragraph

---

[8] The Administration made reference to the Codex standards and the standards of various other jurisdictions such as Australia, Japan, Singapore, the United Kingdom and the USA when making amendments to the First and Second Schedules to the Regulations in 1983.

[9] Codex, established by FAO and WHO in 1960s, is the single most important international source of reference for consumers, food producers, processors, national food control agencies and the international trade in developing food associated standards.

[10] Codex reviews the types of metallic contaminants on which MLs should be set and the MLs from time to time. The latest round of update by Codex is expected to be promulgated in July 2017. We have taken into account the proposed update of the Codex standards in our proposal for amending the Regulations.

2.9).

3.4 The Food and Health Bureau (FHB) and CFS conducted a comprehensive review on the Regulations with a view to identifying aspects in the Regulations which need enhancement / updating, in consultation with the Working Group on Amendments to Food Adulteration (Metallic Contamination) Regulations (the Working Group)[11], the Expert Committee on Food Safety (the Expert Committee)[12] and the Advisory Council on Food and Environmental Hygiene (ACFEH)[13]. FHB and CFS have made reference to the Codex's latest standards on metallic contamination, relevant standards of other jurisdictions[14], local food consumption pattern / dietary practices and results of risk assessment, etc. in reviewing and proposing enhancement / updating to the Regulations.

3.5 FHB, CFS and the aforementioned advisory committees consider it necessary to enhance and update the Regulations along the following directions, with a view to better protecting public health, facilitating effective regulation and promoting harmonisation between local and international standards:-

(a) to replace the existing food categories of "all food in solid / liquid form" (see paragraph 2.2(c) and **Annex I**) with specific MLs targeting individual food / food groups, with a view to aligning with the Codex principle (see paragraph 4.2) and modern international regulatory trends of specifying metallic contamination standards for individual

[11] The Working Group, set up under the Expert Committee on Food Safety (the Expert committee), consists of representatives from the Expert Committee, local and overseas academics / experts, as well as representatives from relevant Government bureaux and departments.

[12] The Expert Committee, set up under CFS, is responsible for advising the Director of Food and Environmental Hygiene in the formulation of food safety measures, review of food safety standards in light of international practices, trends and developments, as well as risk communication strategies. The Expert Committee consists of academics, professionals, food experts, members of the trade and consumer group, and other experts. The current membership includes experts from other places.

[13] ACFEH, set up under the Food and Health Bureau, advises the Secretary for Food and Health on food and environmental hygiene issues. It consists of academics, professionals, food experts, members of the trade, and other experts.

[14] Such as the relevant standards in Australia, Canada, the EU, Japan, Korea, the Mainland, New Zealand, Singapore, the USA, etc.

food / food groups of significant dietary exposure;

(b) to adopt Codex MLs unless otherwise justified;

(c) to establish MLs for food / food groups which are of significance to the population in Hong Kong and which there is no relevant Codex MLs;

(d) to update the food descriptions and nomenclatures in the Regulations[15], with reference to the available Codex's food descriptions and nomenclatures or those of other jurisdictions as appropriate; and

(e) to incorporate interpretation of MLs into the Regulations, given that there is currently no interpretation in the Regulations on how the maximum permitted concentrations can be applied to food in a dried, dehydrated or concentrated form; as well as multi-ingredient products.

3.6 Details of the proposed amendments to the Regulations are set out in Chapter 5.

[15] There is no interpretation of the food definition as well as the portion of the food commodity to which a "maximum permitted concentrations" apply under the existing Regulations.

## Chapter 4 Practices of Codex and Other Jurisdictions

### Codex

4.1 Codex deliberates, adopts, reviews and updates various MLs of contaminants and toxins, including metallic contaminants[16], for various types of food from time to time.

4.2 The Codex ML for a contaminant in a food is the maximum concentration of that substance recommended by Codex to be legally permitted in that commodity. According to the Codex principles for establishing MLs in food, MLs shall only be set for food in which the contaminant may be found in amounts that are significant for the total exposure of the consumer, i.e. the general local population. In other words, it is not necessary to set MLs for each and every type of food that contain a contaminant. In addition, MLs shall be set in such a way that the consumer is adequately protected. At the same time, other legitimate factors[17] need to be considered. The principles of Good Manufacturing Practice and Good Agricultural Practice as defined by Codex, among others, shall be considered. MLs shall be based on scientific principles leading to standards which are designed to assure the quality and safety of food, so that there is no unjustified barrier to international trade.

---

[16] Majority of these MLs are set out in the General Standard for Contaminants and Toxins in Food and Feed (CODEX STAN 193-1995) (GSCTFF). Some are set out in the "Codex Standard for Natural Mineral Waters (CODEX STAN 108-1981)" and the "General Standard for Bottled / Packaged Drinking Waters (Other than Natural Mineral Waters) (CODEX STAN 227-2001)".

[17] The consideration of legitimate factors, relevant for the health protection of consumers and for the promotion of fair practices in food trade, shall be performed in accordance with the Codex Working Principles for Risk Analysis for Food Safety for Application by Governments (CAC/GL 62-2007) and the Criteria for Consideration of the Other Factors Referred to in the Second Statement of Principles (see Statements of Principle Concerning the Role of Science in the Codex Decision-Making Process and the Extent to which other Factors are Taken into Account, Appendix of the Codex Procedural Manual (25th edition)). Relevant production, storage and handling practices used throughout the food chain including traditional practices, methods of analysis, sampling and inspection, feasibility of enforcement and compliance, and the prevalence of specific adverse health effects shall be taken into account. In addition, the economic consequences and the feasibility of risk management options shall also be considered.

4.3 One of the key Codex criteria for establishing MLs of contaminants in food is that MLs for metallic contaminants should be set ALARA and at levels necessary to protect public health. During the establishment of MLs in food, Codex has considered the scientific expert advice from JECFA and taken into account the following criteria:-

(a) toxicological information of the metallic contaminant(s);

(b) analytical data of the metallic contaminant(s) in representative samples;

(c) intake data, including the food consumption data and the dietary exposure of the metallic contaminant(s);

(d) technological considerations (e.g. contamination processes, production and manufacturing practices, etc.); and

(e) risk assessment and risk management considerations (e.g. alternative solutions).

4.4 Codex MLs in general are established for primary agricultural commodities, on the basis of edible part of the product unless otherwise specified, and are expressed on a fresh weight basis. The product, when moving in international trade, is usually defined with reference to the relevant Codex classification as appropriate.

4.5 Also, Codex has provided guidance regarding the application of MLs to processed food or compounded (or multi-ingredient) food in its GSCTFF. When products are concentrated, dried or diluted, use of the concentration or dilution factor is generally appropriate in order to be able to obtain a primary judgement of the contaminant levels in these processed products. The maximum contaminant concentration in a multi-ingredient food can likewise be calculated from the composition of the food.

**Practices of other jurisdictions**

4.6 Regulation of metallic contamination in food is well developed in the international arena. Major jurisdictions such as Australia, the EU, Japan, Korea, the Mainland, New Zealand, Singapore and the USA have statutory regulation on metallic contamination in food, though the regulatory coverage may vary from jurisdiction to jurisdiction.

4.7 Nowadays, most jurisdictions do not set MLs for all types of food (including food in solid and liquid forms) as far as metallic contamination levels are concerned. This practice is in line with Codex's principle that MLs should only be set for food in which the contaminants may be found in amounts that are significant for the total exposure of the consumer, i.e. the general local population (see paragraph 4.2 above).

4.8 Malaysia, Thailand and Singapore are the exceptions, but their regulatory requirements, similar to the Regulations, were established in 1980s or before. Australia and New Zealand once adopted a general ML for "other foods" for various metallic contaminants, in addition to MLs for specific food / food groups. However, the general ML was repealed during their regulatory review in 1999 due to the low contribution to total exposure from a contaminant by these "other foods" and the practical difficulties in setting a meaningful ML for these "other foods".

## Chapter 5 Proposed Amendments to the Regulations

### To replace the existing food categories of "all food in solid / liquid form" with specific MLs targeting individual food / food groups

5.1 As mentioned in paragraph 4.7, most jurisdictions nowadays do not set MLs for all types of food (including food in solid and liquid forms). This practice is in line with Codex's principle that MLs should only be set for food / food groups in which the contaminants may be found in amounts that are significant for the total exposure of the consumer, i.e. the general local population.

5.2 Setting specific MLs targeting individual food / food groups will be conducive to a more focused, tailor-made and proportionate regulation over metallic contamination in food, calibrated in accordance with the known risks associated with the food item concerned.

5.3 For food / food groups without specific MLs under the Regulations, CFS will continue to conduct risk assessment to assess whether the food concerned will be dangerous or prejudicial to health by virtue of Section 54 of the Ordinance and Regulation 3 of the Regulations.

### To adopt Codex MLs unless otherwise justified

5.4 To harmonise the food standards of Hong Kong with international food standards, we propose to adopt MLs for metallic contaminants in various food / food groups recommended by Codex[18] and incorporate them into the Regulations unless there are strong scientific justifications to adopt a different standard. Keeping the Regulations abreast of the Codex standards will safeguard food safety, bring our regulatory practices in alignment with

[18] Majority of these MLs are set out in GSCTFF. Some are set out in the "Codex Standard for Natural Mineral Waters (CODEX STAN 108-1981)" and the "General Standard for Bottled/ Packaged Drinking Waters (Other than Natural Mineral Waters) (CODEX STAN 227-2001)".

international standards, and prevent possible trade barriers and disputes.

5.5 Having reviewed the latest Codex standards, we propose to adopt all Codex MLs on metallic contaminants, save 7 Codex MLs, into the proposed amendments to the Regulations. The 7 Codex MLs which we do not propose to adopt for the food categories specified by Codex and the justifications are set out in **Annex II**.

**To establish MLs for food / food groups which are of significance to the population in Hong Kong and which there is no relevant Codex MLs**

5.6 We propose to establish MLs for food / food groups which are of significance to the local population and which there is no relevant Codex MLs.

5.7 To identify specific food / food groups which are of significance to the local population, we have taken into account factors such as the local food consumption pattern / dietary practice, results of risk assessment studies and TDS conducted locally in the past, recent food incidents in Hong Kong and other jurisdictions, and relevant standards of other jurisdictions[19].

5.8 In proposing the MLs of these food / food groups, we have taken into account Codex's ALARA principle[20]. Also, we have assessed whether the proposed MLs are adequate to protect public health and comparable to the MLs adopted by other jurisdictions.

[19] Such as the relevant standards in Australia, Canada, the EU, Japan, Korea, the Mainland, New Zealand, Singapore, the USA, etc.

[20] According to GSCTFF, contaminant levels in food shall be as low as reasonably achievable (ALARA) through best practices such as Good Agricultural Practice and Good Manufacturing Practice following an appropriate risk assessment.

**To update the food descriptions and nomenclatures in the Regulations, with reference to the available Codex's food descriptions and nomenclatures or those of other jurisdictions as appropriate**

5.9 At present, the food descriptions and nomenclatures in the Regulations are different from the Codex's food descriptions and nomenclatures. We propose to update the Regulations in light of international food descriptions and nomenclatures under the Codex, which would help bring the Regulations in alignment with the internationally accepted food descriptions and nomenclatures, as well as facilitate interpretation of the proposed metallic contamination levels under the Regulations by local and overseas stakeholders alike.

5.10 Where there is no available Codex's food description and nomenclature, we have made reference to those of other jurisdictions as appropriate.

**To incorporate interpretation of MLs into the Regulations, given that there is currently no interpretation in the Regulations on how the maximum permitted concentrations can be applied to food in a dried, dehydrated or concentrated form; as well as multi-ingredient products**

5.11 As a general rule, Codex MLs are set for primary agricultural products. According to Codex's guidance, when products are concentrated, dried or diluted, use of concentration or dilution factor is generally appropriate in order to be able to obtain a primary judgement of the contaminant levels in these processed products. The maximum contaminant concentration in a multi-ingredient food can, likewise, be calculated from the composition of the food (see paragraph 4.5). We propose to adopt these principles in interpreting MLs in the Regulations so as to keep the Regulations on par with the international practice.

**Overview of the proposed MLs**

5.12 Under the proposed amendments to the Regulations:-

(a) the total number of metallic contaminants covered will increase from 7 to 14. On top of the 7 metals currently regulated under the Regulations (i.e. arsenic, antimony, cadmium, chromium, lead, mercury and tin), there will be 7 additional metals, i.e. (i) barium, (ii) boron, (iii) copper, (iv) manganese; (v) nickel, (vi) selenium and (vii) uranium. For the 7 additional metals, MLs are set exclusively with regard to "natural mineral waters" and / or "bottled / packaged drinking waters (other than natural mineral waters)" following the relevant Codex standards[21], but not in other food;

(b) the total number of MLs under the Regulations will increase from 19 to 145. The increase in the number of MLs is mainly the result of the proposed new approach of replacing the existing food categories of "all food in solid / liquid form" with specific MLs targeting individual food / food groups. A summary of the existing and proposed number of metals and their MLs under the Regulations is tabulated below:-

[21] The relevant Codex standards are the "Codex Standard for Natural Mineral Waters" (CODEX STAN 108-1981) and the "General Standard for Bottled / Packaged Drinking Waters (Other than Natural Mineral Waters)" (CODEX STAN 227-2001).

| Metallic Contaminants | Current Regulations (No. of MLs) | Proposed Amendments (No. of MLs) |
|---|---|---|
| **Antimony** | 3 | 9 |
| **Arsenic** | 4 | 17 |
| **Cadmium** | 3 | 28 |
| **Chromium** | 3 | 10 |
| **Lead** | 2 | 52 |
| **Mercury** | 2 | 15 |
| **Tin** | 2 | 2 |
| **7 additional metals** (i.e. (i) barium, (ii) boron, (iii) copper, (iv) manganese; (v) nickel, (vi) selenium and (vii) uranium) | 0 | 12 |
| **Total** | 19 | 145 |

(c) of the 145 proposed MLs, 90 of them are more stringent than the existing maximum permitted concentrations and 6 of them are less stringent than the existing maximum permitted concentrations. A comparison showing the full list of the existing and proposed MLs is at **Annex III**; and

(d) we have not set ML for each and every type of food that may contain a metallic contaminant. Rather, we have set MLs for those types of food on an absolutely necessary basis only and will continue to make use of risk assessment as the safety net, striking a balance between safeguarding public health and avoiding undue regulation.

**Assessment on implications on food supply**

5.13 According to the results of the routine food surveillance programme and additional baseline studies of CFS, the levels of metallic contamination in food available in local market can generally comply with the proposed MLs. The proposed MLs are not likely to affect the food supply in Hong Kong in general.

**Capability of the local testing and laboratory sector**

5.14 CFS had invited the local private testing and laboratory sector to a discussion on its capacity on testing metallic contaminants in food as proposed in the amendments to the Regulations. The local private testing and laboratory sector's initial feedback was that it would be capable of providing testing services for the metallic contaminants as proposed, provided that the sector was given sufficient time in advance to gear up for making available such testing services.

**Regulatory responses to unsatisfactory samples**

5.15 In case there is an unsatisfactory sample, CFS will take risk assessment, management and communication work as established (see paragraphs 2.5 to 2.9).

5.16 As the number of food groups of the proposed MLs will be increased, the types of samples to be collected under CFS' food surveillance programme may be adjusted accordingly. Through redeployment and where necessary, acquisition of resources through established mechanism, CFS will ensure that sufficient manpower resources are deployed for conducting routine food surveillance. Also, CFS will ensure that the enforcement team will be well versed with the new food classification.

**Implementation timetable**

5.17 We will take into account the views received during the three-month public consultation exercise before finalising the legislative proposals and tabling the Amendment Regulations to the Legislative Council for consideration. We will consider giving a reasonable grace period for the Amendment Regulations to come into effect, so that the trade and the private testing and laboratory sector will have reasonable time to get prepared for the updated standards.

## Chapter 6 Views Sought

6.1 We propose to amend the Regulations along the following directions / principles:-

(i) to replace the existing food categories of "all food in solid / liquid form" with specific MLs targeting individual food / food groups, with a view to aligning with the Codex principle and modern international regulatory trends of specifying metallic contamination standards for individual food / food groups of significant dietary exposure;

(ii) to adopt Codex MLs unless otherwise justified;

(iii) to establish MLs for food / food groups which are of significance to the population in Hong Kong and which there is no relevant Codex MLs;

(iv) to update the food descriptions and nomenclatures in the Regulations, with reference to the available Codex's food descriptions and nomenclatures or those of other jurisdictions as appropriate; and

(v) to incorporate interpretation of MLs into the Regulations, given that there is currently no interpretation in the Regulations on how the maximum permitted concentrations can be applied to food in a dried, dehydrated or concentrated form; as well as multi-ingredient products.

6.2 We welcome your views on the proposed amendments to the Regulations as set out in details in Chapter 5, in particular the aforementioned proposed directions / principles.

6.3 Please send your comments by letter, facsimile or e-mail to CFS on or before 5 September 2017:-

Centre for Food Safety
Food and Environmental Hygiene Department
43/F, Queensway Government Offices,
66 Queensway, Hong Kong
Facsimile: (852) 2893 3547
E-mail address: metal_consultation@fehd.gov.hk

6.4 Members of the public are free to supply their personal data when giving views on the consultation document. Any personal data provided with a submission will only be used for purpose of this consultation exercise.

6.5 The submissions and personal data collected may be transferred to the relevant Government bureaux, departments or agencies for purposes directly related to this consultation exercise. The parties receiving the data are bound by such purposes in their subsequent use of the data.

6.6 The names and views of individuals and organisations submitting their views in response to the consultation document (senders) may be published for public viewing after conclusion of the consultation exercise. CFS may, either in discussion with others or in any subsequent report, whether privately or publicly, quote the senders and the views they submitted in response to the consultation document. We will respect the wish of senders to remain anonymous and / or keep the views confidential in part or in whole, but if no such wish is indicated, it will be assumed that the sender can be named and his / her views be published for public information.

6.7 Any sender providing personal data to CFS in his submission will have the right of access and correction with respect to such personal data. Any request for data access or correction of personal data should be made in writing to the contact specified in paragraph 6.3 above.

**Annex I**

# Current Regulations

## Schedule 1: Maximum permitted concentration of certain metals naturally present in specified foods

| Metal | Description of food | Maximum permitted concentration in parts per million |
|---|---|---|
| Arsenic ($AS_2O_3$) | Solids being fish and fish products | 6 |
| | Solids being shellfish and shellfish products | 10 |

## Schedule 2: Maximum permitted concentration of certain metals present in specified foods

| Metal | Description of food | Maximum permitted concentration in parts per million |
|---|---|---|
| Antimony (Sb) | Cereals and vegetables | 1 |
| | Fish, crab-meat, oysters, prawns and shrimps | 1 |
| | Meat of animal and poultry | 1 |
| Arsenic ($AS_2O_3$) | Solids other than- | |
| | (i) fish and fish products; and | |
| | (ii) shellfish and shellfish products | 1.4 |
| | All food in liquid form | 0.14 |
| Cadmium (Cd) | Cereals and vegetables | 0.1 |
| | Fish, crab-meat, oysters, prawns and shrimps | 2 |
| | Meat of animal and poultry | 0.2 |
| Chromium (Cr) | Cereals and vegetables | 1 |
| | Fish, crab-meat, oysters, prawns and shrimps | 1 |
| | Meat of animal and poultry | 1 |
| Lead (Pb) | All food in solid form | 6 |
| | All food in liquid form | 1 |
| Mercury (Hg) | All food in solid form | 0.5 |
| | All food in liquid form | 0.5 |
| Tin (Sn) | All food in solid form | 230 |
| | All food in liquid form | 230 |

**Annex II**

## The 7 Codex Maximum Levels (MLs) of Metallic Contaminants in Food which Are Not Proposed to be Adopted and the Justifications

Having reviewed the latest Codex standards, we propose to adopt all Codex MLs on metallic contaminants, except ML for cadmium in "rice, polished", guideline level (GL)[1] for methylmercury in predatory fish, and 5 MLs for tin in certain meat products in containers other than tinplate containers. The scientific justification of not adopting the following 7 Codex MLs are set out below:-

*(a) Codex ML for cadmium in "rice, polished"*

2. The existing ML for cadmium in cereals (including polished rice) under the Regulations is 0.1 mg/kg. Currently, Codex has established an ML of 0.4 mg/kg for cadmium in "rice, polished". However, it is noted that during the development of such Codex ML, Japan supported the ML of 0.4 mg/kg because some rice samples in Japan contained relatively high levels of cadmium. On the other hand, some jurisdictions expressed their concern that the intake assessment conducted by JECFA had not comprehensively taken into consideration different food intake patterns in some countries / regions and exposure of cadmium to vulnerable groups including children. Taking into account the dietary habit of the Hong Kong population and the relevant standards adopted by various jurisdictions (i.e. the EU, Korea, the Mainland, and Singapore have adopted MLs of 0.2 mg/kg for cadmium in polished rice), a proposed ML for cadmium in "rice, polished" at 0.2 mg/kg, more stringent than Codex, is considered justified to protect public health in Hong Kong.

*(b) Codex GL for methylmercury in predatory fish*

3. The existing ML for mercury in "all food in solid form" (including fish) under the Regulations is 0.5 mg/kg of total mercury. According to GSCTFF, Codex has established GLs for methylmercury[2] in fish (other than predatory fish) and predatory fish at 0.5 mg/kg and 1 mg/kg respectively.

---

[1] According to GSCTFF, a Codex guideline level (GL) is the maximum level of a substance in a food commodity which is recommended by Codex to be acceptable for commodities moving in international trade. When the GL is exceeded, governments are advised to decide whether and under what circumstances the food should be distributed within their territory or jurisdiction.
Because Codex has decided that the preferred format of a Codex standard in food is an ML, the existing or proposed guideline levels shall be reviewed for their possible conversion to an ML after a risk assessment performed by JECFA, if appropriate.

[2] Methylmercury is the major form of mercury in fish. It is more toxic than inorganic mercury.

4. The above Codex GLs are less stringent than the existing standard under the Regulations. According to the report of the 1st HKTDS on metallic contaminants[3], about 11% of women aged 20-49 (childbearing age) had dietary exposure to methylmercury exceeded the relevant HBGV even though the average population was not at risk. Methylmercury exposure during pregnancy is of a public health concern due to potential health risks to the foetus. Fish has been known as the major dietary source of methylmercury. Hence, if we strictly follow the relevant Codex GL which is less stringent than the existing ML for mercury in predatory fish in Hong Kong, this would not be appropriate from a local public health perspective. As such, a proposed ML of 0.5 mg/kg for methylmercury (the major form of mercury in fish) in fish, including predatory fish, is therefore proposed. Even though the above proposed ML when applied to predatory fish is more stringent than the Codex GL of 1 mg/kg for methylmercury in predatory fish, we expect that the proposed ML will have minimal impact on the supply of fish to Hong Kong, and at the same time will not compromise local food safety.

5. In addition, CFS would continue its efforts in delivering dietary advice to susceptible population subgroups following the recommendation from Codex. Moderate consumption of a variety of fish is recommended as fish contains many essential nutrients, such as omega-3 fatty acids and high quality proteins. Pregnant women, women planning pregnancy and young children should avoid eating large or predatory fish and the types of fish which may contain high levels of methylmercury (e.g. tuna, alfonsino, shark, swordfish, marlin, orange roughly and king mackerel).

*(c) 5 Codex MLs for tin in certain meat products in containers other than tinplate containers*

6. The existing ML for tin in all food in solid form (including canned food) under the Regulations is 230 mg/kg. According to GSCTFF, Codex has adopted an ML of 250 mg/kg for tin in canned foods (other than beverages). On the other hand, Codex has also established 5 MLs of 50 mg/kg for tin in certain meat products, namely cooked cured chopped meat, cooked cured ham, cooked cured pork shoulder, corned beef and luncheon meat, in containers other than tinplate containers. However, competent authorities of other jurisdictions such as Australia, Canada, the EU, the Mainland and New Zealand have only

[3] FEHD. The First Hong Kong Total Diet Study: Metallic Contaminants. Hong Kong; FEHD; 2013. Available from URL: http://www.cfs.gov.hk/english/programme/programme_firm/programme_tds_1st_HKTDS_report5_Metallic_Contaminants.html

adopted MLs for canned food but not MLs specified for the above meat products in containers other than tinplate containers.

7. While reasons for Codex establishing lower MLs for the concerned meat products could not be identified, these MLs were in fact established back in 1981. Taking into account that the ML for tin at 250 mg/kg in canned food is adequate to safeguard food safety (i.e. tin contamination in containers other than tinplate containers is not expected) and the practices of other jurisdictions, we suggest confining our proposal to the Codex ML for tin in canned foods (including the meat products specified in the preceding paragraph) at 250 mg/kg (and another Codex ML for tin in canned beverages at 150 mg/kg).

**Annex III**

# Comparison of the Existing and Proposed Maximum Levels (MLs) for Metallic Contaminants in Food

## Antimony (Sb)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Vegetables | 1 | 1 | Notes 1-8 |
| Cereals | 1 | 1 | |
| Meat of animal | 1 | 1 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Meat of poultry | 1 | 1 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Fish | 1 | 1 | Applies to whole commodity after removing the digestive tract. |
| Crabs, prawns and shrimps | 1 | 1 | Applies to edible portion of the crab, including the liver and gonads or parts thereof after removal of shell. |
| Oysters | 1 | 1 | Applies to whole commodity after removal of shell. |
| Natural mineral waters (Note 9) | Not available (Note 10) | 0.005 mg/L | |
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 9) | Not available (Note 10) | 0.02 mg/L | |

Note 1: Bulb/dry onions and garlic: refers to whole commodity after removal of roots and adhering soil and whatever parchment skin is easily detached.

Note 2: Head cabbages and kohlrabi: refers to whole commodity as marketed, after removal of obviously decomposed or withered leaves; Cauliflower and broccoli: refers to flower heads (immature inflorescence only); Brussels sprouts: refers to "buttons" only.

Note 3: "Fruiting vegetables, Cucurbits" and "Fruiting vegetables, other than Cucurbits": refers to whole commodity after removal of stems.

Note 4: Leafy vegetables (including Brassica leafy vegetables): refers to whole commodity as usually marketed, after removal of obviously decomposed or withered leaves.

Note 5: Legume vegetables: refers to whole commodity as consumed. The succulent forms may be consumed as whole pods or as the shelled product.

Note 6: Pulses: applicable to whole commodity

Note 7: Root and tuber vegetables: refers to whole commodity after removing tops and adhering soil (by rinsing in running water or by gentle brushing of the dry commodity); Potato: refers to peeled potato.

Note 8: Stalk and stem vegetables: refers to whole commodity as marketed after removal of obviously decomposed or withered leaves; Rhubarb: refers to leaf stems only; Globe artichoke: applies to flower head only; Celery and asparagus: refers to the whole commodity after removing adhering soil.

Note 9: Adopted from Codex standards.

Note 10: Not available under the Regulations. When antimony is detected in food without specified MLs, CFS will conduct risk assessment to assess whether the detected level is dangerous or prejudicial to health, in accordance with Regulation 3(2) of the Regulations. The risk assessment will take into account a host of factors including HBGV for antimony, the detected level of antimony, relevant food consumption pattern, etc.

## Arsenic (As)

| Food items | Existing maximum permitted concentration (expressed as ($As_2O_3$)) (ppm) | Existing maximum permitted concentration (expressed as inorganic arsenic) (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|---|
| | | | **Expressed as total arsenic** | |
| Vegetables | 1.4 | 1.1 | 0.5 | Notes 1-8 |
| Cereals | 1.4 | 1.1 | 0.5 | Not apply to rice. |
| Meat of animal | 1.4 | 1.1 | 0.5 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Meat of poultry | 1.4 | 1.1 | 0.5 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Animal, edible offal of | 1.4 | 1.1 | 0.5 | |
| Poultry, edible offal of | 1.4 | 1.1 | 0.5 | |
| Edible fats and oils (Note 9) | 1.4 [solid food]/ 0.14 [liquid food] | 1.1 [solid food]/ 0.1 [liquid food] | 0.1 | Not apply to fish oil.* |
| Fat spreads and blended spreads (Note 9) | 1.4 | 1.1 | 0.1 | |
| Salt, food grade (Note 9) | 1.4 | 1.1 | 0.5 | |
| Natural mineral waters (Note 9) | 0.14 | 0.1 | 0.01 (mg/L) | |
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 9) | 0.14 | 0.1 | 0.01 (mg/L) | |
| | | | **Expressed as inorganic arsenic** | |
| Rice, husked (Note 9) | 1.4 | 1.1 | 0.35 | |
| Rice, polished (Note 9) | 1.4 | 1.1 | 0.2 | |

| Food items | Existing maximum permitted concentration (expressed as ($As_2O_3$)) (ppm) | Existing maximum permitted concentration (expressed as inorganic arsenic) (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|---|
| Aquatic animals | 10 | 7.9 | 0.5 | Not apply to fish and intestine of sea cucumber.<br><br>Applies to edible portion of the crab, including the liver and gonads or parts thereof after removal of shell.<br><br>Cephalopods: Applies to whole commodity after removal of shell and viscera.<br><br>Scallops: Applies to whole commodity after removal of shell and viscera. |
| Fish | 6 | 4.8 | 0.1 | Whole commodity after removing the digestive tract. |
| Fish oil* | 0.14 | 0.1 | 0.1 | |
| Seaweed | 1.4 | 1.1 | 1 | |

* Proposed Codex standard, subject to further deliberation of the meeting of the Codex Alimentarius Commission in July 2017.

Note 1: Bulb/dry onions and garlic: refers to whole commodity after removal of roots and adhering soil and whatever parchment skin is easily detached.

Note 2: Head cabbages and kohlrabi: refers to whole commodity as marketed, after removal of obviously decomposed or withered leaves; Cauliflower and broccoli: refers to flower heads (immature inflorescence only); Brussels sprouts: refers to “buttons” only.

Note 3: “Fruiting vegetables, Cucurbits” and “Fruiting vegetables, other than Cucurbits”: refers to whole commodity after removal of stems.

Note 4: Leafy vegetables (including Brassica leafy vegetables): refers to whole commodity as usually marketed, after removal of obviously decomposed or withered leaves.

Note 5: Legume vegetables: refers to whole commodity as consumed. The succulent forms may be consumed as whole pods or as the shelled product.

Note 6: Pulses: applicable to whole commodity.

Note 7: Root and tuber vegetables: refers to whole commodity after removing tops and adhering soil (by rinsing in running water or by gentle brushing of the dry commodity); Potato: refers to peeled potato.

Note 8: Stalk and stem vegetables: refers to whole commodity as marketed after removal of obviously decomposed or withered leaves; Rhubarb: applies to leaf stems only; Globe artichoke: refers to flower head only; Celery and asparagus: refers to the whole commodity after removing adhering soil.

Note 9: Adopted from Codex standards.

## Barium (Ba)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Natural mineral waters (Note 1) | Not available (Note 2) | 0.7 (mg/L) | |
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 1) | | 1.3 (mg/L) | |

Note 1: Adopted from Codex standards.

Note 2: Not available under the Regulations. When barium is detected in food without specified MLs, CFS will conduct risk assessment to assess whether the detected level is dangerous or prejudicial to health, in accordance with Regulation 3(2) of the Regulations. The risk assessment will take into account a host of factors including HBGV for barium, the detected level of barium, relevant food consumption pattern, etc.

## Boron (B)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Natural mineral waters (Note 1) | Not available (Note 2) | 5 (mg/L) | |
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 1) | | 2.4 (mg/L) | |

Note 1: Adopted from Codex standards.

Note 2: Not available under the Regulations. When boron is detected in food without specified MLs, CFS will conduct risk assessment to assess whether the detected level is dangerous or prejudicial to health, in accordance with Regulation 3(2) of the Regulations. The risk assessment will take into account a host of factors including HBGV for boron, the detected level of boron, relevant food consumption pattern, etc.

## Cadmium (Cd)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Bulb vegetables (Note 1) | 0.1 | 0.05 | Note 2 |
| Brassica vegetables (Note 1) | 0.1 | 0.05 | Not apply to Brassica leafy vegetables.<br><br>Note 3 |
| Fruiting vegetables, Cucurbits (Note 1) | 0.1 | 0.05 | Note 4 |
| Fruiting vegetables, other than Cucurbits (Note 1) | 0.1 | 0.05 | Not apply to tomatoes.<br><br>Note 4 |
| Leafy vegetables (including Brassica leafy vegetables) (Note 1) | 0.1 | 0.2 | Note 5 |
| Legume vegetables (Note 1) | 0.1 | 0.1 | Note 6 |
| Pulses (Note 1) | 0.1 | 0.1 | Note 7 |
| Root and tuber vegetables (Note 1) | 0.1 | 0.1 | Note 8 |
| Stalk and stem vegetables (Note 1) | 0.1 | 0.1 | Note 9 |
| Vegetables unless otherwise specified | 0.1 | 0.1 | Notes 2-9 |
| Cereals (Note 10) | 0.1 | 0.1 | Not apply to buckwheat, cañihua, quinoa, wheat and rice. |
| Wheat (Note 1) | 0.1 | 0.2 | |
| Rice, husked | 0.1 | 0.2 | |
| Rice, polished | 0.1 | 0.2 | |
| Meat of cattle, pigs and sheep | 0.2 | 0.05 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Meat of poultry | 0.2 | 0.05 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Liver of cattle, pigs and sheep | Not available (Note 11) | 0.5 | |
| Liver of poultry | Not available (Note 11) | 0.5 | |

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Kidney of cattle, pigs and sheep | Not available (Note 11) | 1 | |
| Kidney of poultry | Not available (Note 11) | 1 | |
| Fish | 2 | 0.1 | Whole commodity after removing the digestive tract. |
| Bivalve molluscs (Note 12) | 2 [oysters] / Not available (Note 11) | 2 | Applies to whole commodity after removal of shell.<br><br>Scallops: Applies to whole commodity after removal of shell and viscera. |
| Cephalopods (Note 1) | Not available (Note 11) | 2 | Applies to whole commodity after removal of shell and viscera. |
| Crustaceans | 2 [crab-meat, prawns and shrimps] / Not available (Note 11) | 2 | Applies to edible portion of the crab, including the liver and gonads or parts thereof after removal of shell. |
| Gastropods | Not available (Note 11) | 2 | Applies to whole commodity after removal of shell and viscera. |
| Salt, food grade (Note 1) | Not available (Note 11) | 0.5 | |
| Natural mineral waters (Note 1) | Not available (Note 11) | 0.003 (mg/L) | |
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 1) | Not available (Note 11) | 0.003 (mg/L) | |

Note 1: Adopted from Codex standards.

Note 2: Bulb/dry onions and garlic: refers to whole commodity after removal of roots and adhering soil and whatever parchment skin is easily detached.

Note 3: Head cabbages and kohlrabi: refers to whole commodity as marketed, after removal of obviously decomposed or withered leaves; Cauliflower and broccoli: refers to flower heads (immature inflorescence only); Brussels sprouts: refers to “buttons” only.

Note 4: “Fruiting vegetables, Cucurbits” and “Fruiting vegetables, other than Cucurbits”: refers to whole commodity after removal of stems.

Note 5: Leafy vegetables (including Brassica leafy vegetables): refers to whole commodity as usually marketed, after removal of obviously decomposed or withered leaves.

Note 6: Legume vegetables: refers to whole commodity as consumed. The succulent forms may be consumed as whole pods or as the shelled product.

Note 7: Pulses: applicable to whole commodity.

Note 8: Root and tuber vegetables: refers to whole commodity after removing tops and adhering soil (by rinsing in running water or by gentle brushing of the dry commodity); Potato: refers to peeled potato.

Note 9: Stalk and stem vegetables: refers to whole commodity as marketed after removal of obviously decomposed or withered leaves; Rhubarb: refers to leaf stems only; Globe artichoke: applies to flower head only; Celery and asparagus: refers to the whole commodity after removing adhering soil.

Note 10: Codex has established an ML of 0.1 mg/kg for cadmium in cereal grains (not applicable to buckwheat, cañihua, quinoa, wheat and rice).

Note 11: Not available under the Regulations. When cadmium is detected in food without specified MLs, CFS will conduct risk assessment to assess whether the detected level is dangerous or prejudicial to health, in accordance with Regulation 3(2) of the Regulations. The risk assessment will take into account a host of factors including HBGV for cadmium, the detected level of cadmium, relevant food consumption pattern, etc.

Note 12: Codex has established an ML of 2 mg/kg for cadmium in marine bivalve molluscs (not applicable to oysters and scallops).

## Chromium (Cr)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Vegetables | 1 | 0.5 | Not apply to pulses.<br><br>Notes 1-7 |
| Pulses | 1 | 1 | Note 8 |
| Cereals | 1 | 1 | |
| Meat of animal | 1 | 1 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Meat of poultry | 1 | 1 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Fish | 1 | 1 | Whole commodity after removing the digestive tract. |
| Crabs, prawns and shrimps | 1 | 1 | Applies to edible portion of the crab, including the liver and gonads or parts thereof after removal of shell. |
| Oysters | 1 | 1 | Applies to whole commodity after removal of shell. |
| Natural mineral waters (Note 9) | Not available (Note 10) | 0.05 (mg/L) | |
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 9) | Not available (Note 10) | 0.05 (mg/L) | |

Note 1: Bulb/dry onions and garlic: refers to whole commodity after removal of roots and adhering soil and whatever parchment skin is easily detached.

Note 2: Head cabbages and kohlrabi: refers to whole commodity as marketed, after removal of obviously decomposed or withered leaves; Cauliflower and broccoli: refers to flower heads (immature inflorescence only); Brussels sprouts: applies to “buttons” only.

Note 3: “Fruiting vegetables, Cucurbits” and “Fruiting vegetables, other than Cucurbits”: refers to whole commodity after removal of stems.

Note 4: Leafy vegetables (including Brassica leafy vegetables): refers to whole commodity as usually marketed, after removal of obviously decomposed or withered leaves.

Note 5: Legume vegetables: refers to whole commodity as consumed. The succulent forms may be consumed as whole pods or as the shelled product.

Note 6: Root and tuber vegetables: refers to whole commodity after removing tops and adhering soil (by rinsing in running water or by gentle brushing of the dry commodity); Potato: applies to peeled potato.

Note 7: Stalk and stem vegetables: refers to whole commodity as marketed after removal of obviously decomposed or withered leaves; Rhubarb: refers to leaf stems only; Globe artichoke: applies to flower head only; Celery and asparagus: refers to the whole commodity after removing adhering soil.

Note 8: Pulses: applicable to whole commodity.

Note 9: Adopted from Codex standards.

Note 10: Not available under the Regulations. When chromium is detected in food without specified MLs, CFS will conduct risk assessment to assess whether the detected level is dangerous or prejudicial to health, in accordance with Regulation 3(2) of the Regulations. The risk assessment will take into account a host of factors including HBGV for chromium, the detected level of chromium, relevant food consumption pattern, etc.

## Copper (Cu)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Natural mineral waters (Note 1) | Not available (Note 2) | 1 (mg/L) | |
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 1) | | 2 (mg/L) | |

Note 1: Adopted from Codex standards.

Note 2: Not available under the Regulations. When copper is detected in food without specified MLs, CFS will conduct risk assessment to assess whether the detected level is dangerous or prejudicial to health, in accordance with Regulation 3(2) of the Regulations. The risk assessment will take into account a host of factors including HBGV for copper, the detected level of copper, relevant food consumption pattern, etc.

## Lead (Pb)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Fruits (Note 1) | 6 | 0.1 | Not apply to cranberry, currants and elderberry.<br><br>Note 2 |
| Cranberry (Note 1) | 6 | 0.2 | Note 3 |
| Currants (Note 1) | 6 | 0.2 | Note 4 |
| Elderberry (Note 1) | 6 | 0.2 | Note 3 |
| Bulb vegetables (Note 1) | 6 | 0.1 | Note 5 |
| Brassica vegetables (Note 1) | 6 | 0.1 | Not apply to Brassica leafy vegetables.<br><br>Note 6 |
| Fruiting vegetables, Cucurbits (Note 1) | 6 | 0.05 | Note 7 |
| Fruiting vegetables, other than Cucurbits (Note 1) | 6 | 0.05 | Note 7 |
| Leafy vegetables (Brassica leafy vegetables) (Note 1) | 6 | 0.3 | Not apply to spinach.<br><br>Note 8 |
| Legume vegetables (Note 1) | 6 | 0.1 | Note 9 |
| Pulses† | 6 | 0.1 | Note 10 |
| Root and tuber vegetables (Note 1) | 6 | 0.1 | Note 11 |
| Edible fungi | 6 | 1 | |
| Canned fruits (Note 1) | 6 | 0.1 | Applies to the product as consumed. |
| Jams, jellies and marmalades† | 6 | 0.4 | |
| Mango chutney (Note 1) | 6 | 1 | |
| Canned vegetables (Note 1) | 6 | 0.1 | Applies to canned brassica vegetables.†<br><br>Applies to the product as consumed. |

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Preserved tomatoes † | 6 | 0.05 | |
| Processed tomato concentrates† | 6 | 0.05 | |
| Table olives (Note 1) | 6 | 0.4 | |
| Pickled cucumbers (cucumber pickles) (Note 1) | 6 | 0.1 | |
| Canned chestnuts and canned chestnuts puree† | 6 | 0.05 | |
| Cereal grains (Note 1) | 6 | 0.2 | Not apply to buckwheat, cañihua and quinoa. |
| Meat of cattle, pigs and sheep (Note 1) | 6 | 0.1 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Meat of poultry (Note 1) | 6 | 0.1 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Cattle, edible offal of (Note 1) | 6 | 0.5 | |
| Pig, edible offal of (Note 1) | 6 | 0.5 | |
| Poultry, edible offal of (note 1) | 6 | 0.5 | |
| Aquatic animals | 6 | 1 | Not apply to fish, bivalve molluscs and crustaceans.<br><br>Applies to edible portion after removal of viscera. |
| Fish (Note 1) | 6 | 0.3 | Whole commodity after removing the digestive tract. |
| Bivalve molluscs | 6 | 1.5 | Applies to whole commodity after removal of shell.<br><br>Scallops: Applies to whole commodity after removal of shell and viscera. |

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Crustaceans | 6 | 0.5 | Applies to edible portion of the crab, including the liver and gonads or parts thereof after removal of shell. |
| Milk (Note 1) | 1 | 0.02 | |
| Secondary milk products (Note 1) | 6 [solid food] /1[liquid] | 0.02 | Applies to the food as consumed. |
| Infant formula, formula for special medical purposes intended for infants and follow-up formula (Note 1) | 6 | 0.01 | Applies to formula as consumed. |
| Eggs | 6 | 0.2 | Not apply to lime preserved eggs. |
| Lime preserved eggs | 6 | 0.5 | |
| Edible fats and oils (Note 1) | 6 [solid food] /1[liquid] | 0.1 | |
| Fat spreads and blended spreads (Note 1) | 6 | 0.1 | |
| Salt, food grade (Note 1) | 6 | 2 | |
| Natural mineral waters (Note 1) | 1 | 0.01 (mg/L) | |
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 1) | 1 | 0.01 (mg/L) | |
| Fruit juices (Note 1) | 1 | 0.03 | Not apply to juices exclusively from berries and other small fruits.<br><br>Applies to whole commodity (not concentrated) or commodity reconstituted to the original juice concentration, ready to drink.<br><br>Applies also to nectars, ready to drink. |

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Fruit juices exclusively from berries and other small fruits (Note 1) | 1 | 0.05 | Applies to whole commodity (not concentrated) or commodity reconstituted to the original juice concentration, ready to drink.<br><br>Applies also to nectars, ready to drink. |
| Carbonated beverages | 1 | 0.2 (mg/L) | |
| Tea beverages | 1 | 0.2 (mg/L) | |
| Coffee beverages | 1 | 0.2 (mg/L) | |
| Wine (Note 1) | 1 | 0.2 | |
| Tea leaves | 6 | 5 | |
| Dried chrysanthemum | 6 | 5 | |
| Leaves of Chinese Holly | 6 | 2 | |
| Coffee beans | 6 | 0.5 | |

† Proposed Codex standard, subject to further deliberation of the meeting of the Codex Alimentarius Commission in July 2017.

Note 1: Adopted from Codex standards.

Note 2: Berries and other small fruits: refers to whole commodity after removal of caps and stems; Pome fruits: applies to whole commodity after removal of stems; Stone fruits, dates and olives: refers to whole commodity after removal of stems and stones, but the level calculated and expressed on the whole commodity without stem; Pineapple: refers to whole commodity after removal of crown; Avocado, mangos and similar fruit with hard seeds: refers to whole commodity after removal of stone but calculated on whole fruit.

Note 3: Applicable to whole commodity after removal of caps and stems.

Note 4: Applicable to fruit with stem.

Note 5: Bulb/dry onions and garlic: refers to whole commodity after removal of roots and adhering soil and whatever parchment skin is easily detached.

Note 6: Head cabbages and kohlrabi: refers to whole commodity as marketed, after removal of obviously decomposed or withered leaves; Cauliflower and broccoli: refers to flower heads (immature inflorescence only); Brussels sprouts: refers to “buttons” only.

Note 7: “Fruiting vegetables, Cucurbits” and “Fruiting vegetables, other than Cucurbits”: refers to whole commodity after removal of stems.

Note 8: Leafy vegetables (including Brassica leafy vegetables): refers to whole commodity as usually marketed, after removal of obviously decomposed or withered leaves.

Note 9: Legume vegetables: refers to whole commodity as consumed. The succulent forms may be consumed as whole pods or as the shelled product.

Note 10: Pulses: refers to whole commodity.

Note 11: Root and tuber vegetables: refers to whole commodity after removing tops and adhering soil (by rinsing in running water or by gentle brushing of the dry commodity); Potato: refers to peeled potato.

## Manganese (Mn)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Natural mineral waters (Note 1) | Not available (Note 2) | 0.4 (mg/L) | |

Note 1: Adopted from Codex standards.

Note 2: Not available under the Regulations. When manganese is detected in food without specified MLs, CFS will conduct risk assessment to assess whether the detected level is dangerous or prejudicial to health, in accordance with Regulation 3(2) of the Regulations. The risk assessment will take into account a host of factors including HBGV for manganese, the detected level of manganese, relevant food consumption pattern, etc.

## Mercury (Hg)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| | | **Expressed in methylmercury** | |
| Fish (Note 1) | 0.5 (total mercury) | 0.5 | Whole commodity after removing the digestive tract. |
| | | **Expressed in total mercury** | |
| Vegetables | 0.5 (total mercury) | 0.01 | Not apply to edible fungi.<br><br>Notes 2-9 |
| Edible fungi | 0.5 (total mercury) | 0.1 | |
| Rice, husked rice, polished rice, maize, maize flour, wheat, wheat flour | 0.5 (total mercury) | 0.02 | |
| Meat of animal | 0.5 (total mercury) | 0.05 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Meat of poultry | 0.5 (total mercury) | 0.05 | Applies to whole commodity (without bones).<br><br>Also applies to fat from the meat. |
| Animal, edible offal of | 0.5 (total mercury) | 0.05 | |
| Poultry, edible offal of | 0.5 (total mercury) | 0.05 | |
| Aquatic animals | 0.5 (total mercury) | 0.5 | Not apply to fish.<br><br>Applies to edible portion of the crab, including the liver and gonads or parts thereof after removal of shell.<br><br>Cephalopods: Applies to whole commodity after removal of shell and viscera.<br><br>Scallops: Applies to whole commodity after removal of shell and viscera. |
| Milk | 0.5 (total mercury) | 0.01 | |
| Secondary milk products | 0.5 (total mercury) | 0.01 | Applies to the food as consumed. |

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Eggs | 0.5 (total mercury) | 0.05 | |
| Salt, food grade (Note 10) | 0.5 (total mercury) | 0.1 | |
| Natural mineral waters (Note 10) | 0.5 (total mercury) | 0.001 (mg/L) | |
| | | **Expressed in inorganic mercury** | |
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 10) | 0.5 (total mercury) | 0.006 (mg/L) | |

Note 1: Codex has established a guideline level (GL) of 0.5 mg/kg of methylmercury in fish (not applicable to predatory fish).

Note 2: Bulb/dry onions and garlic: refers to whole commodity after removal of roots and adhering soil and whatever parchment skin is easily detached.

Note 3: Head cabbages and kohlrabi: refers to whole commodity as marketed, after removal of obviously decomposed or withered leaves; Cauliflower and broccoli: applies to flower heads (immature inflorescence only); Brussels sprouts: applies to “buttons” only.

Note 4: “Fruiting vegetables, Cucurbits” and “Fruiting vegetables, other than Cucurbits”: refers to whole commodity after removal of stems.

Note 5: Leafy vegetables (including Brassica leafy vegetables): refers to whole commodity as usually marketed, after removal of obviously decomposed or withered leaves.

Note 6: Legume vegetables: refers to whole commodity as consumed. The succulent forms may be consumed as whole pods or as the shelled product.

Note 7: Pulses: refers to whole commodity

Note 8: Root and tuber vegetables: refers to whole commodity after removing tops and adhering soil (by rinsing in running water or by gentle brushing of the dry commodity); Potato: refers to peeled potato.

Note 9: Stalk and stem vegetables: refers to whole commodity as marketed after removal of obviously decomposed or withered leaves; Rhubarb: refers to leaf stems only; Globe artichoke: applies to flower head only; Celery and asparagus: refers to the whole commodity after removing adhering soil.

Note 10: Adopted from Codex standards.

## Nickel (Ni)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Natural mineral waters (Note 1) | Not available (Note 2) | 0.02 (mg/L) | |
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 1) | | 0.07 (mg/L) | |

Note 1: Adopted from Codex standards.

Note 2: Not available under the Regulations. When nickel is detected in food without specified MLs, CFS will conduct risk assessment to assess whether the detected level is dangerous or prejudicial to health, in accordance with Regulation 3(2) of the Regulations. The risk assessment will take into account a host of factors including HBGV for nickel, the detected level of nickel, relevant food consumption pattern, etc.

## Selenium (Se)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Natural mineral waters (Note 1) | Not available (Note 2) | 0.01 (mg/L) | |
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 1) | | 0.04 (mg/L) | |

Note 1: Adopted from Codex standards.

Note 2: Not available under the Regulations. When selenium is detected in food without specified MLs, CFS will conduct risk assessment to assess whether the detected level is dangerous or prejudicial to health, in accordance with Regulation 3(2) of the Regulations. The risk assessment will take into account a host of factors including HBGV for selenium, the detected level of selenium, relevant food consumption pattern, etc.

## Tin (Sn)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Canned foods | 230 | 250 | Not apply to canned beverages. |
| Canned beverages | 230 | 150 | |

## Uranium (U)

| Food items | Existing maximum permitted concentration (ppm) | Proposed maximum level (ML) (mg/kg, unless otherwise specified) | Portion of the commodity/product to which the proposed ML applies (The proposed ML applies to the edible portion if there is no specification) |
|---|---|---|---|
| Bottled/packaged drinking waters (other than natural mineral waters) (Note 1) | Not available (Note 2) | 0.03 (mg/L) | |

Note 1: Adopted from Codex standards.

Note 2: Not available under the Regulations. When uranium is detected in food without specified MLs, CFS will conduct risk assessment to assess whether the detected level is dangerous or prejudicial to health, in accordance with Regulation 3(2) of the Regulations. The risk assessment will take into account a host of factors including HBGV for uranium, the detected level of uranium, relevant food consumption pattern, etc.

Published by the Centre for Food Safety, Food and Environmental Hygiene Department
Printed by the Government Logistics Department (06/2017)