



**Briefing Session on**  
**Outsourcing of**  
**Food Tests:**  
**Review and Way Forward**

**Government Laboratory**  
**November 2022**

# Food Monitoring



# Handling of test results from contract laboratories (1)



Review Test Certificate

Review QC



Follow-up

# Handling of test results from contract laboratories (2)

## ★ Test certificates

- HOKLAS endorsed certificates or certificates endorsed by an accreditation body recognised by HKAS under a mutual recognition arrangement (MRA)
- Signed by an approved signatory
- Sample information, test data and other relevant particulars

# Handling of test results from contract laboratories (3)

## ★ QC and other relevant information

### ★ Quality control data

- Method blank, spike recoveries, precision of duplicate test, quality control samples .... etc.

### ★ Information (e.g. photos) on the appearance and the packaging of the sample

### ★ Relevant raw data in electronic file

- Including instrumental printout, worksheets for test samples and quality control data

# Handling of test results from contract laboratories (4)

## ★ Follow-up

- ★ Test results
  - Regulatory limits, measurement uncertainty, etc.
- ★ Other requirements specified in regulations (Example)
  - Food Adulteration (Metallic Contamination) Regulations (Cap. 132V):
    - Section 3 (2) (b): “.... *specified food that has gone through a process of drying, dehydration or concentration ....*”
    - Section 3 (4): “.... *If all ingredients of a compounded food are specified food, the maximum level of a specified metal in the compound food is the sum of the maximum level of the specified metal in each ingredient multiplied by the proportion ....*”

# Salient Points (1)

- ✦ Accredited in corresponding tests
  - ✦ maintaining accreditation status (i.e. scope and reporting limit) from application to the end of contract period
- ✦ Test parameters in specified matrices
- ✦ Specified reporting limits
- ✦ Delivery time of results
  - ✦ 3 – 15 days
- ✦ Testing capacity
  - ✦ 20 – 140 samples per week

# Salient Points (2)

- ✦ Test sample collection
  - ✦ within 1 working day upon notification
  - ✦ GL Headquarters at Homantin
- ✦ Retention of remaining test samples
- ✦ Past performance will be taken into account when future quotations are evaluated

# **Review of Outsourcing Contracts in 2022-23**

# Outsourcing in 2022-23

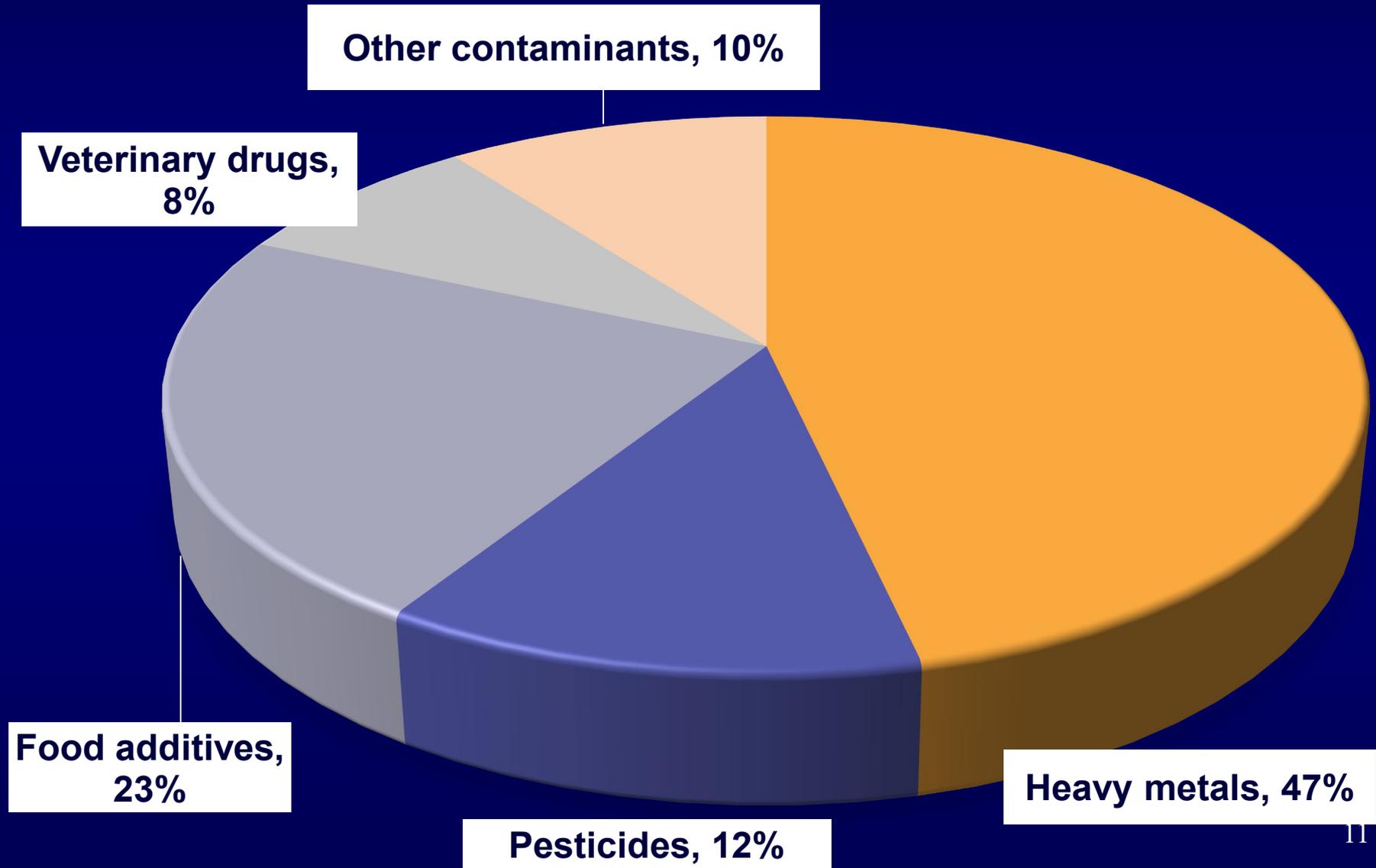
## ★ 22 contracts

- ★ total about 125,000 tests
- ★ contract period: 5 months to 1 year
- ★ Quotation exercises ended in Oct 2022

## ★ Invitations to quotation

- ★ Phase I , January 2022 (8 contracts)
- ★ Phase II, February 2022 (8 contracts)
- ★ Phase III, May 2022 (3 contracts)
- ★ Phase IV, June 2022 (2 contracts)
- ★ Phase V, September 2022 (1 contract)

# SAMPLE DISTRIBUTION IN 2022-23



# CAP 132 Public Health and Municipal Services Ordinance

- ✿ CAP 132H Colouring Matter in Food Regulations
- ✿ CAP 132V Food Adulteration (Metallic Contamination) Regulations
- ✿ CAP 132W Food and Drugs (Composition and Labelling) Regulations
- ✿ CAP 132AF Harmful Substances in Food Regulations
- ✿ CAP 132BD Preservatives in Food Regulation
- ✿ CAP 132CM Pesticide Residues in Food Regulation

# Issued Contracts (Food Additives) (1)

## ★ Sulphur dioxide and other preservatives

- ★ 3 contracts in general foodstuffs
- ★ SO<sub>2</sub> alone (1 year)
- ★ SO<sub>2</sub> + 3 acids (benzoic acid, sorbic acid, salicylic acid) + 3 parabens (1 year)
- ★ SO<sub>2</sub> + 2 acids (benzoic acid, sorbic acid) + 3 parabens (6 months)
- ★ Total about 3,240 samples
- ★ Reporting limits: 8 mg/kg for SO<sub>2</sub>, 30 mg/kg for parabens and 50 mg/kg for acids

# Issued Contracts (Food Additives) (2)

## ★ Nitrate/Nitrite

- ★ 1 contract (1 year) in meat, meat products and dairy products
- ★ About 495 samples
- ★ Reporting limits: 5 mg/kg for nitrite (as  $\text{NaNO}_2$ ) and 30 mg/kg for nitrate (as  $\text{NaNO}_3$ )

## ★ Propionic acid

- ★ 1 contract (6 months) in flour confectionery
- ★ About 210 samples
- ★ Reporting limit: 50 mg/kg

# Issued Contracts (Pesticides) (1)

- ✦ Pesticide Residues in Food Regulation (Cap 132CM)
- ✦ 6 contracts issued
- ✦ Test parameters: selected from
  - ✦ Survey on pesticide residue testing in December 2021
- ✦ Matrices: Fruit, vegetables and cereal grains
- ✦ Total no. of samples: About 2,160

# Issued Contracts (Pesticides) (2)

## ☀ Pesticide residues

- ☀ Residue definitions
- ☀ Reporting limit: according to maximum residue limit (MRL) on quotation documents
- ☀ April 2022 to March 2023 (3 Contracts)
  - List 22A (79 pesticides) in fruit and vegetables, about 500 samples
  - List 22B (32 pesticides) in fruit and vegetables, about 500 samples
  - List 22C (60 pesticides) in cereal grain, about 405 samples

# Issued Contracts (Pesticides) (3)

## ☀ Pesticide residues

- ☀ August 2022 to January 2023 (2 Contracts)
  - List 22D (40 pesticides) in vegetables, about 105 samples
  - List 22E (78 pesticides) in fruit and vegetables, about 365 samples
  
- ☀ November 2022 to March 2023 (1 Contract)
  - List 22F (66 pesticides) in fruit and vegetables, about 285 samples

# Issued Contracts (Veterinary Drug Residues)

## ★ Chloramphenicol

- ★ 1 contract (1 year) for meat and aquatic products
- ★ About 705 samples
- ★ Reporting limit: 0.3  $\mu\text{g}/\text{kg}$

## ★ Malachite Green

- ★ 1 contract (1 year) for aquatic products
- ★ Malachite Green and Leucomalachite Green
- ★ About 710 samples
- ★ Reporting limit: MG and LMG: 0.5  $\mu\text{g}/\text{kg}$  each

# Issued Contracts (Heavy Metals) (1)

## ☀ 1 to 7 Heavy metals in general foodstuffs

- ☀ 1 year contract for 1 to 7 heavy metals out of Sb, As, Cd, Cr, Pb, Hg and Sn in general foodstuffs
- ☀ About 2855 samples
- ☀ Reporting limits: lower limits for Pb and Hg (see next slide)

## ☀ 1 to 6 Heavy metals in general foodstuffs

- ☀ 1 year contract for 1 to 6 heavy metals out of Sb, As, Cd, Cr, Pb and Hg in general foodstuffs
- ☀ About 1325 samples
- ☀ Reporting limits: lower limits for Pb and Hg (see next slide)

# Issued Contracts (Heavy Metals) (2)

- ★ 1 to 7 Heavy metals in miscellaneous foods
  - 1 year contract for 1 to 7 heavy metals out of Sb, As, Cd, Cr, Pb, Hg and Sn in miscellaneous foods
  - About 2530 samples
  - Reporting limits: see next slide

# Issued Contracts (Heavy Metals) (3)

## ☀ Reporting limits

	HMs in General Foodstuffs	HMs in Misc Foods
<b>Arsenic (as total arsenic)</b>	0.1 mg/kg	0.1 mg/kg
<b>Antimony</b>	0.2 mg/kg	0.2 mg/kg
<b>Cadmium</b>	0.02 mg/kg	0.02 mg/kg
<b>Chromium</b>	0.2 mg/kg	0.2 mg/kg
<b>Lead</b>	0.05 mg/kg	0.1 mg/kg
<b>Mercury (as total mercury)</b>	0.01 mg/kg	0.03 mg/kg
<b>Tin</b>	10 mg/kg	10 mg/kg

# Issued Contracts (Heavy Metals) (4)

## ✦ Inorganic arsenic

- ✦ 1 year contract for inorganic arsenic in rice and aquatic products
- ✦ About 920 samples
- ✦ Reporting limits: 0.1 mg/kg

## ✦ Methylmercury

- ✦ 1 year contract for methylmercury in fish
- ✦ About 450 samples
- ✦ Reporting limits: 0.5 mg/kg

# Issued Contracts (Other Contaminants) (1)

## ★ Sudan Dyes

- ★ 1 contract (1 year) in general foodstuffs
- ★ Sudan I, II, III, IV, Sudan Orange G, Sudan Red 7B, Dimethyl Yellow
- ★ About 1,070 samples
- ★ Reporting limits: 20 µg/kg each

## ★ Melamine

- ★ 1 contract (1 year) in general foodstuffs
- ★ About 420 samples
- ★ Reporting limit: 1 mg/kg

# Issued Contracts (Other Contaminants) (2)

## ✦ Boric acid

- ✦ 1 contract (6 months) in general foodstuffs
- ✦ About 95 samples
- ✦ Reporting limit: 50 mg/kg

## ✦ Aflatoxins

- ✦ 1 contract (12 months) in oils, nuts and cereals
- ✦ About 190 samples
- ✦ Reporting limit: 0.5 ug/kg each of aflatoxin B1, B2, G1, G2

**Way Forward:**  
**Outsourcing Contracts**  
**in 2023-24**

# Outsourcing Contracts in 2023-24

- ✦ Around 128,000 tests
- ✦ Some contracts begin in April 2023
  - ✦ Invitations to quotation will be sent in January / February 2023
- ✦ Contract period
  - ✦ 6 months to 1 year

# Technical Specifications (1)

## ("Entry requirements")

### Accreditation – scope and reporting limits

**PART 5**  
**TECHNICAL SPECIFICATIONS**

2. Service Provider shall be accredited by Hong Kong Accreditation Service (HKAS) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) or by an accreditation body with which HOKLAS has concluded mutual recognition agreements/arrangements (MRA), before the Quotation Closing Date, with the Scope of Accreditation including the testing of residues of 19 pesticides in cereal grains.

XX Accreditation body

Name of accreditation body

Note.  
Please provide:

- (i) a copy of notification letter / accreditation certificate(s) pertaining to the test scope as in Clause 3 of Terms of Quotation,
- (ii) a summary of test methods accredited by the accreditation body for the provision of service, including the reporting limits and measurement uncertainties of all test parameters as given in the Services Specifications,
- (iii) contact information (e.g. email address) of the accreditation body, if other than HKAS;
- (iv) other relevant documents deemed necessary for quotation evaluation.

Column 4	Column 5
<b>Required Reporting Limit (mg/kg)</b>	<b>Service Provider's Reporting Limit (mg/kg)</b>
0.05	0.01
0.1	0.1

No.	Pesticide	Residue definition	Column 4	Column 5	Compliance (tick as appropriate)	
			Required Reporting Limit (mg/kg)	Service Provider's Reporting Limit (mg/kg)	Yes	No
1	Atrazine	Atrazine	0.05			
2	Carfentrazone ethyl	Sum of carfentrazone-ethyl and carfentrazone-chloropropionic acid (alpha,2-dichloro-5-(4-difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl)-4-fluorobenzenepropanoic acid)	0.1			

# Technical Specifications (2) ("Entry requirements")

## Accreditation – scope and reporting limits

2. Service Provider shall be accredited by Hong Kong Accreditation Service (HKAS) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) or by an accreditation body with which HOKLAS has concluded mutual recognition agreements/arrangements (MRA), before the Quotation Closing Date, with the Scope of Accreditation including the testing of residues of 19 pesticides in cereal grains.

Name of accreditation body: **XX Accreditation body**

Note:  
Please provide:

(i) a copy of notification letter / accreditation certificate(s) pertaining to the test scope as in Clause 3 of Terms of Quotation,

(ii) a summary of test methods accredited by the accreditation body for the provision of service, including the reporting limits and measurement uncertainties of all test parameters as given in the Services Specifications,

(iii) contact information (e.g. email address) of the accreditation body, if applicable.

a copy of notification letter / accreditation certificate(s) / extract of accreditation report(s) / confirmation from accreditation body pertaining to the test scope and the most updated accredited reporting limit(s) as in clause 3 of Terms of Quotation.

<\*<GL may verify the submitted information with relevant accreditation bodies>

**Appendix I of accreditation report**

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Appendix I

**Scope of Assessment:**  
Government Laboratory – Analytical and Advisory Services Division  
政府化驗所 - 分析及諮詢事務部

Government Laboratory				Reporting limit
TEST CATEGORY 測試類別	ITEMS, MATERIALS OR PRODUCTS TESTED 測試項目 - 材料或產品	SPECIFIC TESTS OR PROPERTIES MEASURED 特定測試或量度的特性	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED 規格、標準方法或應用技術	
FOOD				
	Fish	Multiresidue ✓	In-house Methods GL-TE-96 (LC-ECF-M5)	0 ug/kg
	Drinking Water	Chlorine(VI) ✓	In-house Methods GL-TD-97 (LC-ECF-M5)	0.1 ug/L
	Rice	Inorganic arsenic ✓	In-house Methods GL-TD-100 (HG-ECF-M5)	0.1 ug/kg

# Technical Specifications (3)

## ("Entry requirements")

### Proficiency Test

- ★ At least one *Proficiency Test* in the past 12 months (calculated from closing date of quotation)
  - ★ *Proficiency Test* shall be organized by a proficiency test provider accredited in accordance with ISO/IEC 17043:2010 or equivalent
- ★ *Satisfactory positive results in the PT*
  - ★ Results that were correctly quantified with z-scores within the range of  $\pm 2.0$  in Proficiency Tests
- ★ Within test scope of Service Specifications

# Other General Requirements

- ✦ **Maintain accreditation status**
  - ✦ Maintaining the accreditation status (i.e. scope and reporting limit) from application to the end of contract period
- ✦ **Test sample collection**
  - ✦ within 1 working day upon notification
  - ✦ at specified locations
- ✦ **Report results within specified period**
- ✦ **Retention / return of remaining test samples**

# Outsourcing: Test Areas

- ✱ Food additives
- ✱ Pesticide residues
- ✱ Veterinary drug residues
- ✱ Heavy metals
- ✱ Other contaminants

# Contracts on Additives (1)

## ★ Sulphur dioxide and other preservatives

- ★ About 3 contracts
- ★ About 3,200 samples in total
- ★ Different combinations of :
  - ★ SO<sub>2</sub>
  - ★ SO<sub>2</sub> + 2 or 3 acids (benzoic acid, sorbic acid, with or without salicylic acid) + 3 parabens
- ★ Reporting limits: 8 mg/kg for SO<sub>2</sub>, 30 mg/kg for parabens and 50 mg/kg for acids

## Contracts on Additives (2)

- ✱ Propionic acid in flour confectionary (About 210 samples)
  - ✱ Reporting limit: 50 mg/kg
- ✱ Nitrate / nitrite in meat, meat products and dairy products (About 750 samples)
  - ✱ Reporting limit: 30 mg/kg as  $\text{NaNO}_3$  and 5 mg/kg as  $\text{NaNO}_2$

# Contracts on Pesticide Residues

- About 6 contracts planned for FY 2023-24
- About 2,200 samples in total
- Cover residues definition (unless otherwise stated in service specifications)
- Reporting limit: according to MRL on quotation documents
- Depend on testing capability of service providers at time of launch

# Contracts on Veterinary Drug Residues

- ✱ Chloramphenicol in meat and aquatic products  
(About 750 samples)
  - ✱ Reporting limit: 0.3  $\mu\text{g}/\text{kg}$
  
- ✱ Malachite green in aquatic products  
(About 750 samples)
  - ✱ Reporting limit: 0.5  $\mu\text{g}/\text{kg}$ , each for MG or LMG

# Contracts on Heavy Metals (1)

- ✦ About 8,200 samples in total
- ✦ Inorganic arsenic
  - ✦ Matrices: rice and aquatic products
  - ✦ Reporting limit: 0.1 mg/kg
  - ✦ Contract period: Apr 2023 – Mar 2024
- ✦ Methylmercury
  - ✦ Matrix: fish
  - ✦ Reporting limit: 0.5 mg/kg
  - ✦ Contract period: Apr 2023 – Mar 2024

# Contracts on Heavy Metals (2)

- ✦ About 3 contracts with 2 including Tin
- ✦ Contract period: Apr 2023 – Mar 2024

	Lower reporting limits	Regular reporting limits
<b>Arsenic (as total arsenic)</b>	0.1 mg/kg	0.1 mg/kg
<b>Antimony</b>	0.2 mg/kg	0.2 mg/kg
<b>Cadmium</b>	0.02 mg/kg	0.02 mg/kg
<b>Chromium</b>	0.2 mg/kg	0.2 mg/kg
<b>Lead</b>	0.05 mg/kg	0.1 mg/kg
<b>Mercury (as total mercury)</b>	0.01 mg/kg	0.03 mg/kg
<b>Tin</b>	10 mg/kg	10 mg/kg

# Contracts on Other Contaminants (1)

- ★ Sudan dyes in general foodstuffs (About 1,050 samples)
  - ★ Sudan I, II, III, IV, Sudan Orange G, Sudan Red 7B and Dimethyl Yellow
  - ★ Reporting limit : 20 µg/kg each
- ★ Melamine in general foodstuffs and liquid infant formula (About 460 samples)
  - ★ Reporting limit: 1 mg/kg for general foodstuffs; 0.15 mg/kg for liquid infant formula
- ★ Boric acid in general foodstuffs (About 100 samples)
  - ★ Reporting limit: 50 mg/kg

## Contracts on Other Contaminants (2)

- ✦ Aflatoxin in oils, nuts and cereal (About 250 samples)
  - ✦ Aflatoxin B1, B2, G1, G2
  - ✦ Reporting limit : 0.5  $\mu\text{g}/\text{kg}$  each
- ✦ Confirmation by MS/MS technique
- ✦ Contract period – 12 months

# Survey on Pesticide Residues Testing

- Survey on pesticide residues testing will be conducted in December 2023
  - Multi-residue test methods
  - Food matrices: - Fruit and vegetables  
- Cereal grains

# Test Parameters of Interest

## ★ Cap132AF Harmful Substances in Food Regulations (Amendment) 2021

- ★ Nitrofurans (e.g. AOZ, AMOZ) in aquatic products
- ★ Synthetic hormones in meat
- ★ Beta-agonist (Clenbuterol & Salbutamol) in meat
- ★ Benzo(a)pyrene (BaP) in fat and oil and milk formula
- ★ 3-MCPD in condiments
- ★ Patulin in apple juice & its beverage products
- ★ Deoxynivalenol (DON) in cereal-based food

## ★ Cap132U Sweeteners in Food Regulations

- ★ Sweeteners in general foodstuff

.....*keep in view the development* .....

Please visit the website of CFS for the relevant technical information:

- ★ [https://www.cfs.gov.hk/english/food\\_leg/food\\_leg.html](https://www.cfs.gov.hk/english/food_leg/food_leg.html)

# GL's proficiency test (PT) programmes

## ☀ PT programmes

- ☀ Boric acid in food
- ☀ Propionic acid in flour confectionery
- ☀ Salicylic acid in food

[https://www.govtlab.gov.hk/en/our\\_work/proficiency\\_testing\\_programmes.html](https://www.govtlab.gov.hk/en/our_work/proficiency_testing_programmes.html)



# ISO 14001 Certification

- ✦ GL has since 1998 established, implemented, maintained and continually improved an environmental management system (EMS) in accordance with ISO 14001 standard.
- ✦ Environmental friendly approach (e.g. chemical waste handled by ISO 14001 certified company)



**Thank You**