

Briefing on Outsourcing of Food Tests: Review and Way Forward

**Government Laboratory
November 2024**



政府化驗所
Government Laboratory

Outline

- Food Monitoring and Handling of Test Results
- Review of Outsourcing Contracts in 2024-2025
- Way Forward: Outsourcing Contracts in 2025-2026



Food Monitoring and Handling of Test Results



Food Monitoring

- Food and Environmental Department → Centre for Food Safety (CFS) → Food Surveillance Programme → Food samples to Government Laboratory → Test by GL or Outsource to contract laboratory → Results to CFS → Result interpretation by CFS → Follow-up actions for unsatisfactory results by CFS (e.g. press release, follow-up samples to GL)



Handling of test results from contract laboratories (1)

- Review Test report
- Review QC & raw data
- Follow-up actions



Handling of test results from contract laboratories (2)

- Test reports
 - HOKLAS endorsed reports or reports 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, matrix spike, duplicate, laboratory control samples, etc.
 - Information (e.g. photos) on the appearance, labelling (esp. important for samples containing sulphur dioxide) 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
 - Measurement uncertainty
 - Repeated analysis
 - Confirmation (by second technique or changes of instrumental conditions, e.g. another column). Some contracts (e.g. aflatoxins) require MS/MS for confirmation)
 - Return remaining samples to GL



Handling of test results from contract laboratories (5)

- Follow-up
 - 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*”



Handling of test results from contract laboratories (6)

- Follow-up
 - Other requirements specified in regulations (Example: Sulphur dioxide)
 - Preservatives in Food Regulation (Cap. 132BD) :
 - *Specific preservatives/antioxidants not exceeding the maximum permitted level are allowed to be used as food additives in the corresponding foods in Hong Kong.*
 - Food and Drugs (Composition and Labelling) Regulations (Cap. 132W) :
 - *If the food contains sulphite (sulphur dioxide) in a concentration of 10 parts per million or more, the name and functional class of the sulphite shall be specified in the list of ingredients.*

Reference : https://www.cfs.gov.hk/english/faq/faq_03.html



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 – 150 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 2024-25

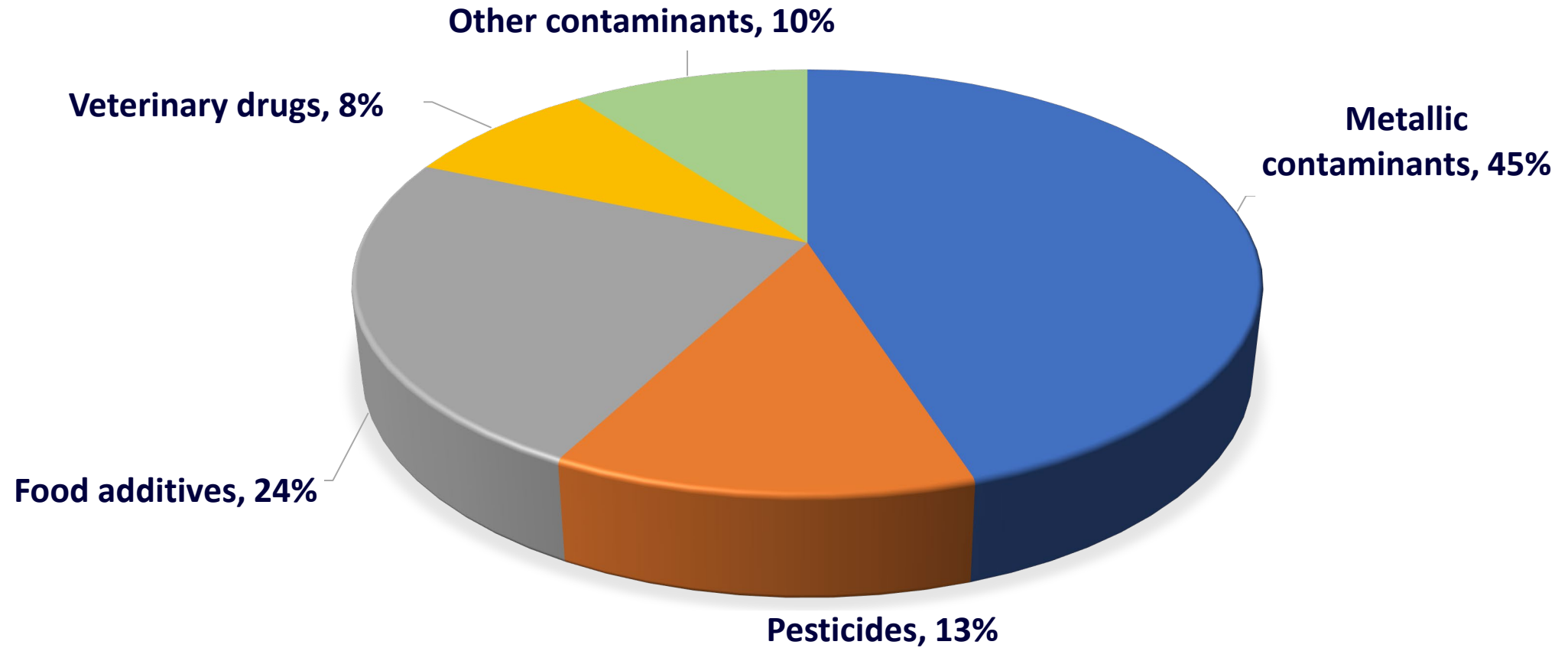


Outsourcing in 2024-25

- 22 contracts
 - Total about 129,000 tests
 - Contract period: from 5 months to 1 year
 - Quotation exercises ended in September 2024
- Invitations to quotation
 - Phase I , January 2024 (8 contracts)
 - Phase II, February 2024 (8 contracts)
 - Phase III, May 2024 (3 contracts)
 - Phase IV, June 2024 (2 contracts)
 - Phase V, September 2024 (1 contract)



Sample Distribution in 2024-25



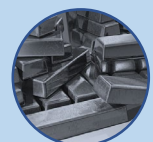
Cap. 132 Public Health and Municipal Services Ordinance

- 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



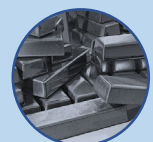
Issued Contracts (Food Additives) (1)

- Sulphur dioxide and other preservatives
 - 1 contract (12 months) for SO₂ in general foodstuffs
 - 1 contract (12 months) for SO₂, 3 acids (benzoic acid, sorbic acid, salicylic acid) and parabens in general foodstuffs
 - 1 contract (6 months) for SO₂, 2 acids (benzoic acid, sorbic acid) and parabens in general foodstuffs
 - Reporting limits: 8 mg/kg for SO₂, 30 mg/kg for parabens and 50 mg/kg for acids



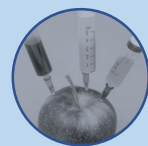
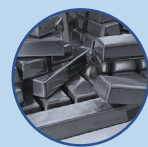
Issued Contracts (Food Additives) (2)

- Nitrite (as NaNO_2) and nitrate (as NaNO_3)
 - 1 contract (12 months) in meat and dairy products
 - Reporting limits: 5 mg/kg for nitrite (as NaNO_2) and 30 mg/kg for nitrate (as NaNO_3)
- Propionic acid
 - 1 contract (6 months) in flour confectionery
 - Reporting limit: 50 mg/kg



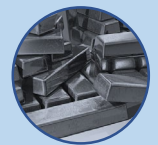
Issued Contracts (Pesticides)

- Pesticide residues
 - Pesticide Residues in Food Regulation (Cap. 132CM)
 - 6 contracts (5-12 months): Lists 24A, 24B, 24C, 24D, 24E, 24F
 - Matrices: Fruit, vegetables (including bulb vegetables) and cereal grains
 - Residue definitions in accordance with Cap. 132CM
 - Reporting limit: according to maximum residue limit (MRL) on quotation documents



Issued Contracts (Veterinary Drug Residues)

- Chloramphenicol
 - 1 contract (12 months) in meat and aquatic products
 - Reporting limit: 0.3 $\mu\text{g}/\text{kg}$
- Malachite green
 - 1 contract (12 months) in aquatic products
 - Malachite Green (MG) and Leucomalachite Green (LMG)
 - Reporting limit: MG and LMG: 0.5 $\mu\text{g}/\text{kg}$ each



Issued Contracts (Metallic Contaminants) (1)

- Metallic contaminants
 - 3 contracts (each 12 months) on total heavy metals (As, Sb, Cd, Cr, Pb, Hg, Sn)
 - Heavy metals (1-7M) in general foodstuffs
 - Heavy metals (1-6M) in general foodstuffs (No Sn)
 - Heavy metals in miscellaneous foods
 - 2 contracts (each 12 months) on metal speciation
 - Methylmercury in fish
 - Inorganic arsenic in rice and aquatic products



Issued Contracts (Metallic contaminants) (2)

Reporting limits:

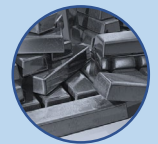
- Methyl mercury: 0.5 mg/kg
- Inorganic arsenic: 0.1 mg/kg

Reporting Limits (mg/kg)	1-7M (Low RL)	1-6M (Low RL)	1-7M (High RL)
Arsenic (as total As)	0.1	0.1	0.1
Antimony	0.2	0.2	0.2
Cadmium	0.02	0.02	0.02
Chromium	0.2	0.2	0.2
Lead	<u>0.05</u>	<u>0.05</u>	<u>0.1</u>
Mercury (as total Hg)	<u>0.01</u>	<u>0.01</u>	<u>0.03</u>
Tin	10	----	10



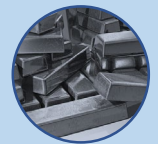
Issued Contracts (Other Contaminants) (1)

- Sudan dyes
 - 1 contract (12 months) in general foodstuffs
 - Sudan I, II, III, IV, Sudan Orange G, Sudan Red 7B, Dimethyl Yellow
 - Reporting limits: 20 µg/kg each
- Melamine
 - 1 contract (12 months) in general foodstuffs and liquid infant formula
 - Reporting limit: 1 mg/kg (General foodstuff)
 - Reporting limit: 0.15 mg/kg (Liquid infant formula)



Issued Contracts (Other Contaminants) (2)

- Boric acid
 - 1 contract (6 months) in general foodstuffs
 - Reporting limit: 50 mg/kg
- Aflatoxins
 - 1 contract (12 months) in oils, nuts and cereals
 - Reporting limit: 0.5 µg/kg each of aflatoxin B1, B2, G1, G2



Way Forward:

Outsourcing Contracts in 2025-26



Outsourcing Contracts in 2025-26

- Around 130,000 tests
- Some contracts begin in April 2025
 - Invitations to quotation will be sent in January / February 2025
- Contract period
 - From 5 months to 1 year



Technical Specifications (Entry requirements) (1)

- Invitation to Quotation – Part 5 Technical Specifications
 - Provide laboratory services in Hong Kong
 - Accredited by HKAS under HOKLAS, or an accreditation body under MRA
 - Copy of notification letter and relevant pages issued by accreditation body indicating the accredited reporting limits



Technical Specifications (Entry requirements) (2)

- Relevant pages issued by accreditation body indicating:
 - Category (i.e. Food)
 - Item tested or measured (e.g. General foodstuff)
 - Specific test or property measured (e.g. Preservatives: - Benzoic acid)
 - Method used (e.g. In-house Method GL-AD-5(A))
 - Reporting limit (e.g. 20 ppm)



Technical Specifications (Entry requirements) (3)

- Service Provider's accredited reporting limits shall be equal to or better than the level stated in table
 - Enter reporting limits for each analyte in column 4
 - Indicate compliance (yes or no, tick as appropriate)

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	Acephate	Acephate	0.1	0.05	✓	
2	Acetamiprid	Acetamiprid	0.01	0.01	✓	
3	Aldicarb	Sum of aldicarb and its sulphoxide and sulphone, expressed as aldicarb	0.02	0.02	✓	



Technical Specifications (Entry requirements) (4)

- 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 or equivalent
- **Satisfactory positive results** in the PT
 - Results that were **correctly quantified** with z-scores within the range of **± 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
- Metallic contaminants
- Other contaminants



Contracts on Additives (1)

- Sulphur dioxide and other preservatives
 - About 3 contracts
 - Three combinations of :
 - SO_2
 - SO_2 + 2 or 3 acids (benzoic acid, sorbic acid, with or without salicylic acid) + 3 parabens
 - Reporting limits: 8 mg/kg for SO_2 , 30 mg/kg for parabens and 50 mg/kg for acids
 - Contract durations: 6 months to 12 months



Contracts on Additives (2)

- Use titrimetric method for reporting sulphur dioxide results
 - When sulphur dioxide is found to exceed the reporting limit of 8 mg/kg, the test result based on **titrimetric / titration method** shall be reported. Upon request, the Contractor shall provide all test data including those obtained from alternative techniques where applicable.
 - Preferably confirmed by **gravimetric method**.



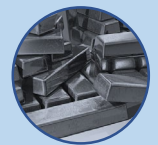
Contracts on Additives (3)

- Propionic acid in flour confectionary
 - Contract period: July 2025 to December 2025
 - Reporting limit: 50 mg/kg
- Nitrate / nitrite in meat, meat products and dairy products
 - Contract period: April 2025 to March 2026
 - Reporting limit: 30 mg/kg as NaNO_3 and 5 mg/kg as NaNO_2



Contracts on Pesticide Residues (1)

- About 6 contracts planned for FY 2025-26
- Contract durations: 5 months to 12 months
- 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 Pesticide Residues (2)

- Lists 25 A, B, C, D, E, F
 - List 25A (~79 pesticides) in fruit and vegetables
 - List 25B (~32 pesticides) in fruit and vegetables (can be separated by GC)
 - List 25C (~62 pesticides) in cereal grain
 - List 25D (~40 pesticides) in bulb vegetables
 - List 25E (~71 pesticides) in fruit and vegetables
 - List 25F (~66 pesticides) in fruit and vegetables



Contracts on Veterinary Drug Residues

- Chloramphenicol in meat and aquatic products
 - Contract period: April 2025 to March 2026
 - Reporting limit: 0.3 µg/kg
- Malachite green in aquatic products
 - Contract period: April 2025 to March 2026
 - Malachite Green (MG) and Leucomalachite Green (LMG)
 - Reporting limit: MG and LMG: 0.5 µg/kg each



Contracts on Metallic contaminants (1)

- Three contracts on heavy metals (total) from one to seven metals
 - As, Sb, Cd, Cr, Pb, Hg, and Sn
- One contract on inorganic arsenic
- One contract on methylmercury
- Contract period: April 2025 to March 2026



Contracts on Metallic contaminants (2)



- 1-7 heavy metals
- Vegetables, sauces, compound foods, etc.
- Lower RL for lead (0.05 mg/kg) and mercury (0.01 mg/kg)



Contracts on Metallic contaminants (3)



- 1-6 heavy metals (**no Tin**)
- Cereals, rice, flour
- Lower RL for lead (0.05 mg/kg) and mercury (0.01 mg/kg)



Contracts on Metallic contaminants (4)



- 1-7 Metallic contaminants
- Meat, fish, fruits
- Higher RL for lead (0.1 mg/kg) and mercury (0.03 mg/kg)



Contracts on Metallic contaminants (6)

Reporting Limits

Reporting Limits (mg/kg)	1-7M (Low RL)	1-6M (Low RL)	1-7M (High RL)
Arsenic (as total As)	0.1	0.1	0.1
Antimony	0.2	0.2	0.2
Cadmium	0.02	0.02	0.02
Chromium	0.2	0.2	0.2
Lead	<u>0.05</u>	<u>0.05</u>	<u>0.1</u>
Mercury (as total Hg)	<u>0.01</u>	<u>0.01</u>	<u>0.03</u>
Tin	10	----	10



Contracts on Metallic contaminants (7)

- Inorganic arsenic in rice and aquatic products
 - Contract period: April 2025 to March 2026
 - Reporting limit: 0.1 mg/kg
- Methylmercury in fish
 - Contract period: April 2025 to March 2026
 - Reporting limit: 0.5 mg/kg



Contracts on Other Contaminants (1)

- Sudan dyes in general foodstuffs
 - Contract period: April 2025 to March 2026
 - Sudan I, II, III, IV, Sudan Orange G, Sudan Red 7B and Dimethyl Yellow
 - **Reporting Limit updated: ~~20 µg/kg each~~ → 10 µg/kg each**



Contracts on Other Contaminants (2)

- Melamine in general foodstuffs and liquid infant formula
 - Contract period: April 2025 to March 2026
 - Reporting limit: 1 mg/kg for general foodstuffs; and
 - Reporting limit: **0.15 mg/kg** for liquid infant formula
 - 3 working days



Contracts on Other Contaminants (3)

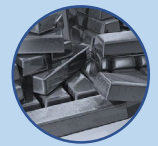
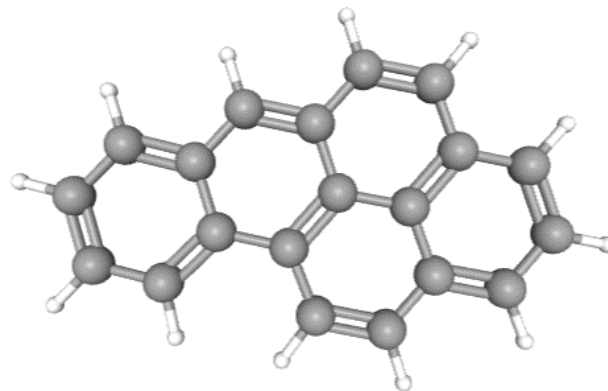
- Aflatoxin in oils, nuts and cereal
 - Aflatoxin B1, B2, G1, G2
 - Contract period: April 2025 to March 2026
 - Reporting limit : 0.5 µg/kg each
 - Confirmation by MS/MS technique
- Boric acid in general foodstuffs
 - Contract period: July 2025 to December 2025
 - Reporting limit: 50 mg/kg



Potential New Outsourcing Contract

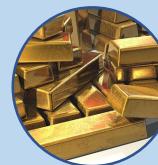
- **Benzo[a]pyrene**

- > 100 samples
- Fat / Oil
- Cap. 132AF: $\leq 5 \mu\text{g/kg}$
- Reporting limit : $5 \mu\text{g/kg}$
- Confirmation by MS or MS/MS technique



Amendment to Food Adulteration Regulations (Cap. 132V)

- Public consultation: 3 months
- To Legislative Council: 2nd half of 2025
- Transitional Period: 18 months
- <https://www.legco.gov.hk/yr2024/english/panels/fseh/papers/fseh20241008cb2-1168-5-e.pdf>



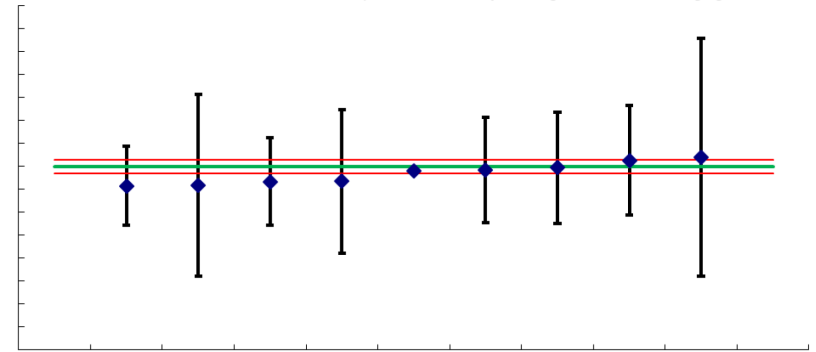
Test Parameters of Interest

- **Cap. 132AF Harmful Substances in Food Regulations (Amendment) 2021**
 - Nitrofurant (e.g. AOZ, AMOZ) in aquatic products
 - Synthetic hormones in meat
 - Beta-agonist (Clenbuterol & Salbutamol) in meat
 - 3-MCPD in condiments
 - Patulin in apple juice & its beverage products
 - Deoxynivalenol (DON) in cereal-based food
- **Cap. 132U Sweeteners in Food Regulations**
 - Sweeteners in general foodstuff
- 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
 - Inorganic arsenic in aquatic product
- 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)