



Food Analysis Workshop: Proficiency Testing and
Reference Materials Development
19th-21st June 2019

**The Role of the Measurement, Standards and
Conformance Infrastructure in Sectoral Challenges**

Stewart Jones
Coordinator APFAN

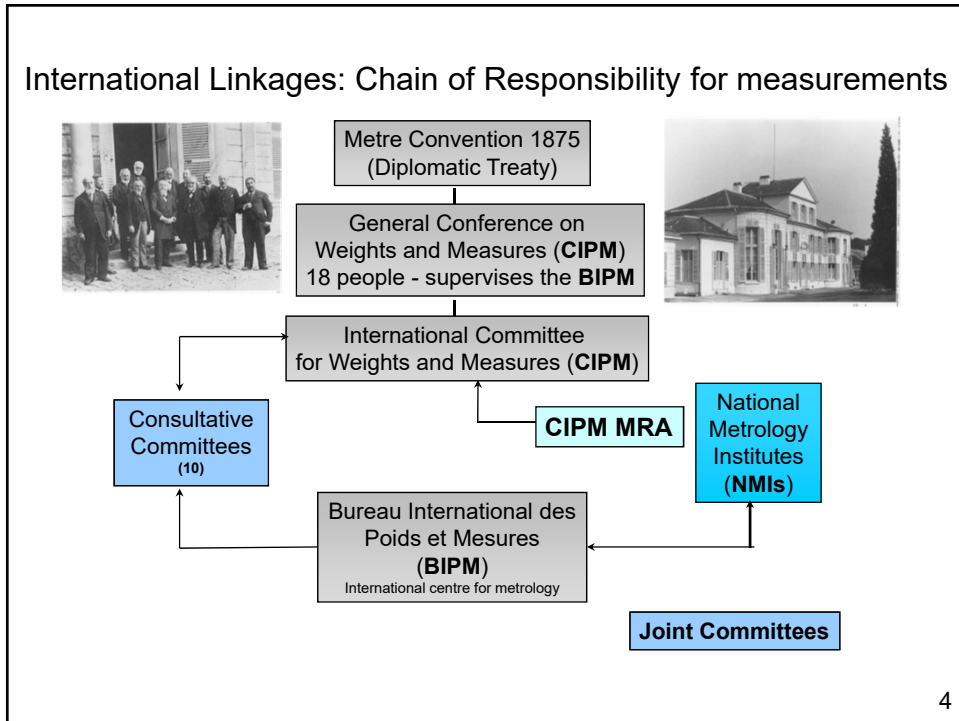
Venue: Ambassador Hotel Bangkok,
171 Sukhumvit 11
Bangkok 10110,
THAILAND

1



Always try to see the big picture

2



Fundamental SI Units

Measured Quantity	Name	Symbol	Definition
Mass	kilogram	kg	The mass of the cylinder: (a) deposited in the International Bureau of Weights and Measures; and (b) declared to be the International Prototype Kilogram by the First General Conference on Weights and Measures held in Paris in 1889.
Amount of substance	mole	mol	The amount of substance of a system which contains as many elementary entities as there are in 0.012 kg of Carbon-12.
Length	metre	m	The length of the path travelled by light in a vacuum during a time interval of 1/299 792 458 of a second.
Time	second	s	The duration of 9 192 631 770 periods of the radiation corresponding to the transition between the 2 hyperfine levels of the ground state of the caesium-133 atom.
Luminous intensity	candela	cd	The luminous intensity, in a given direction, of a source that emits monochromatic radiation of the frequency of 540×10^{12} hertz and has a radiant intensity in that direction of 1/683 watt per steradian.
Temperature	kelvin	K	The fraction of 1/273.16 of the thermodynamic temperature of the triple point of water.
Electric current	ampere	A	The unvarying electric current that, when flowing in each of two parallel straight conductors of infinite length of negligible cross-section and separated by a distance of one metre from each other in free space, produces between these conductors a force equal to 0.2×10^{-6} newtons per metre of conductor.

5

WORLD METROLOGY DAY

World Metrology Day



20 May 2019
www.worldmetrologyday.org

- World Metrology Day is an annual celebration of the signature of the Metre Convention on **20 May 1875** by representatives of seventeen nations.
- The Convention set the framework for global collaboration in the science of measurement and in its industrial, commercial and societal applications.
- The original aim of the Metre Convention - the world-wide uniformity of measurement - remains as important today as it was in 1875.

6



Dr Barry Inglis

- Inaugural CEO of the National Measurement Institute, Australia.
- Elected President of CIPM 2009 and 2015.
- CIPM “Grand Challenges”.

7

CIPM - International Committee for Weights and Measures

Facilitating collaboration:

- ISO (International Organization for Standardization)
- ILAC (International Laboratory Accreditation Cooperation)
- OIML (International Organization of Legal Metrology)
- IEC (International Electrotechnical Commission)
- WHO (World Health Organization)

8

CIPM - The Big Issues

- Big data analytics:
 - IT governance, cross border data flows.
- Smart Cities.
- “The Internet of Things” (IoT).
- Sustainability.
- Nanotechnology.
- Food, health, **environment, energy.**



9

CIPM - The Big Issues

Environment:

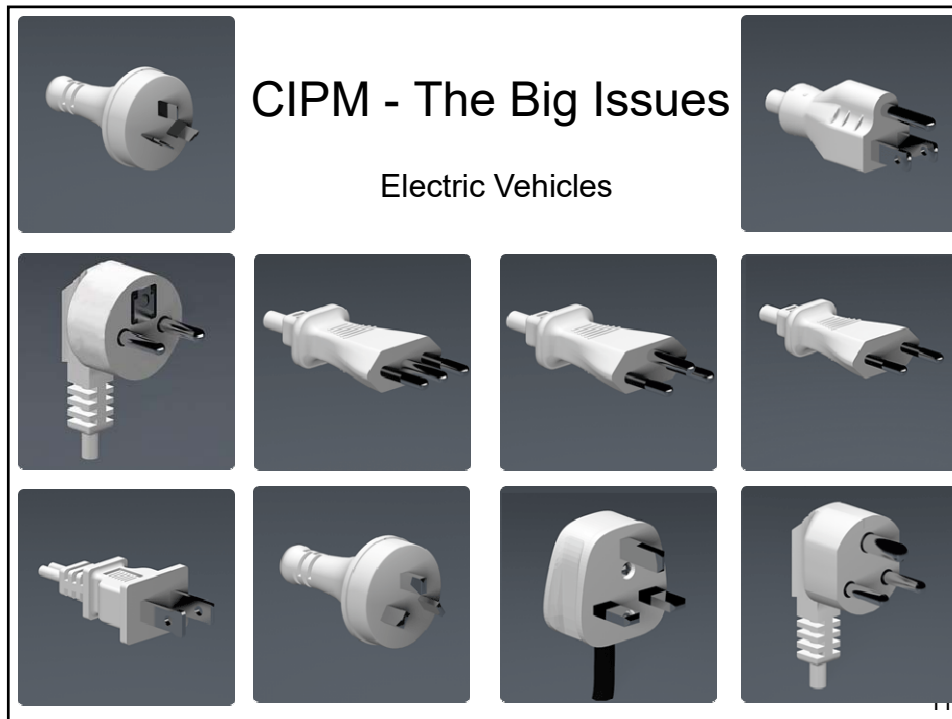
- WMO (World Meteorological Organization).



WORLD
METEOROLOGICAL
ORGANIZATION

Pressure Standards now based on SI

10



CIPM - The Big Issues

Need to engage with Standards and Conformance Systems at all levels:

- Not only internationally but also nationally:
 - ❑ NMIs, Standards Bodies, Certification Bodies, Accreditation bodies).
- Need to put something in to get something out:
 - ❑ Link into food export chains but don't want to be a 'dumping ground'.
- "Deregulation" requires underpinning of standards and conformance infrastructure.

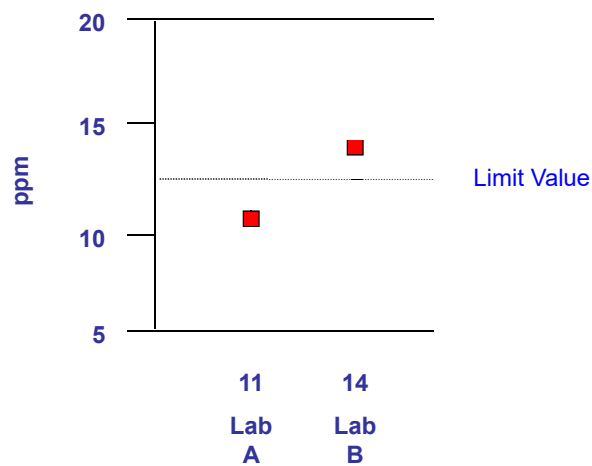
Conformity Assessment

- **Conformity assessment, or compliance assessment,** is any activity to determine that a process, product, or service meets relevant standards and requirements.
- Conformity assessment activities may include:
 - Testing
 - Surveillance
 - Inspection
 - Auditing
 - Certification
 - Registration
 - Accreditation

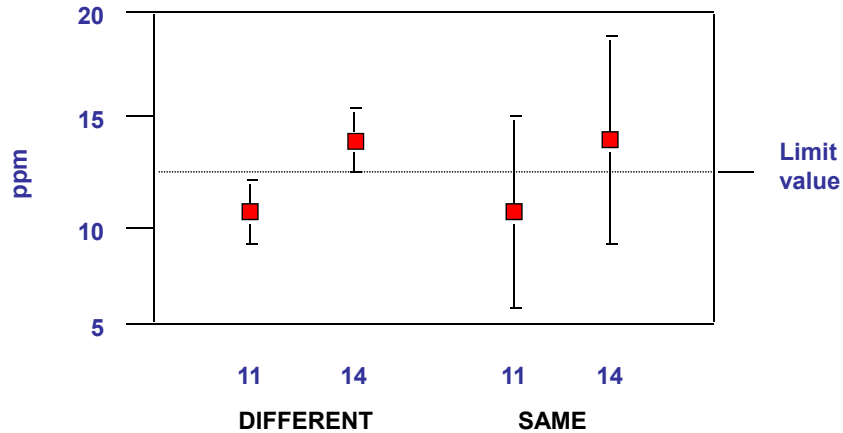


What does it mean for food analysts?

- Comparison of Results



Comparison of Results and MU



15

Comparability is Not Enough



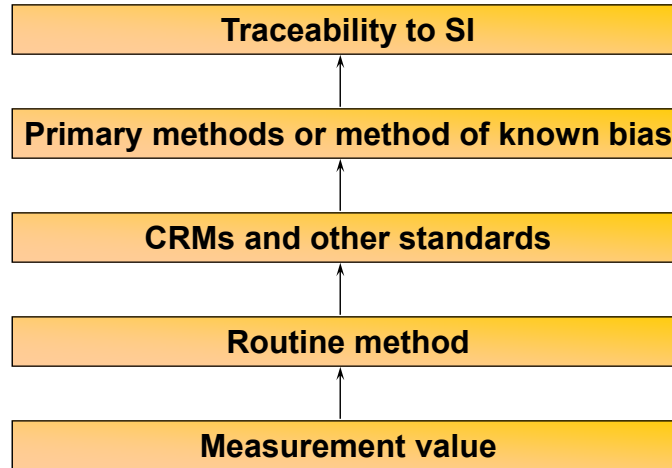
- **TRACEABILITY**

- “A property of the result of a measurement
- or the value of a standard
- whereby it can be related to stated references
- usually national or international standards
- through an unbroken chain of comparisons
- all having stated uncertainties.”

International Vocabulary of Basic and General Terms in Metrology (VIM)

16

Traceability to SI



17

The main changes in ISO/IEC 17025:2017

6. Resource requirements

6.4 Equipment

6.4.1

- Description of items considered as equipment is more inclusive (including, but not limited to, measuring instruments, software, measurement standards, reference materials, reference data, reagents, consumables or auxiliary apparatus).

6.4.6

- Specific requirements for calibration (in terms of validity of the reported results, and metrological traceability).

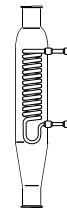
18

7.7 Ensuring the validity of results

- Clause separates requirements for monitoring done within the laboratory (7.7.1) and those involving comparison with other laboratories (7.7.2):
- **Data from internal activities (7.7.1) required to be recorded such that trends can be detected and, where practicable, statistical techniques applied;**
- **Both required to be planned and reviewed, analyzed, used to control and (if applicable) improve laboratory activities;**
- **Action required when results of analysis of data found to be outside pre-defined criteria.**

19

Proficiency Testing in Accreditation ISO/IEC 17025:2017



7.7.2 The laboratory shall monitor its performance by comparison with results of other laboratories, where available and appropriate. This monitoring shall be planned and reviewed and shall include either or both of:

- a) participation in proficiency testing;**
- b) participation in interlaboratory comparisons other than proficiency testing.**

20



A novel approach
to food safety



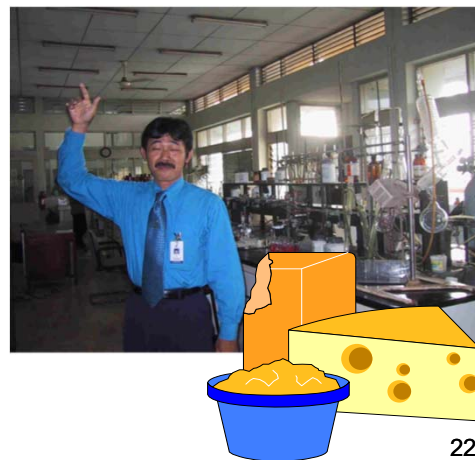
A regional
approach to trade

21

Laboratory Capacity Building: The Importance of Sound Measurement

Implicit in both of these food safety and trade systems is the existence of a reliable food analysis laboratory system to help identify and assess risks.

**THE FOOD TESTING
LABORATORY
IS AN INTEGRAL
PART OF FOOD
SAFETY and FOOD
TRADE SYSTEMS**



22

ASEAN Food Safety Network (AFSN)

- AFSN established in 2003 and the website launched at www.aseanfoodsafetynetwork.net.
- Includes the ASEAN Consultative Network plus the Expert Group on Food Safety, Task Force on Codex, and Working Group on Halal Foods; and
- The ASEAN Food Safety Network (AFSN) and the ASEAN Food Testing Laboratories Committee (AFTLC).

AFSN Enables dissemination of food safety regulations, and access to information for new requirements or urgent occurrences.



Global Food Safety Partnership (GFSP)

<https://www.gfsp.org/about-us>

Aligning Food Safety Capacity Building Initiatives:

- Food safety training and technical support tailored to the specific needs of individual countries.
- Safe food handling behaviours that reduce risks across the whole food value chain.
- Critical to food security, poverty alleviation, and economic growth.
- Opens new economic opportunities to participate in the global food value chain.



Asia Pacific Economic Cooperation (APEC) Food Safety Cooperation Forum (FSCF)

APEC FSCF established in April 2007 to:

- Better coordinate food safety capacity building activities.
- harmonise food standards with international standards.
- Improve public health.



Partnership Training Institute Network (PTIN) - To strengthen laboratory capacity through science-based, internationally accepted laboratory practices.

25

World Trade Organization

- Established in 1995 as a successor of the General Agreement on Tariffs and Trade (GATT).
- Includes almost 153 member nations and covers 97% of world trade.
- Headquarters located in Geneva, Switzerland.

For international trade in food, the two of the most important agreements are the:

- Sanitary and Phytosanitary Agreement (SPS)
- Technical Barriers to Trade (TBT) Agreement



The ASEAN Economic Community (AEC)

- 13th ASEAN Summit in Singapore, 2007, to establish a common market for ASEAN members through removing trade barriers and tariffs.
- AEC based on “**four freedoms**” (the movement of products, services, labour, and capital).
- AEC plan **focused** on the four pillars of integration:
 - (i) a single market and production base,
 - (ii) a competitive economic region,
 - (iii) Equitable economic development, and
 - (iv) Integration with the global economy.
- ASEAN goal of becoming a successful trading region with more than 3 billion people, a combined GDP of about \$17 trillion, and about 40 percent of world trade.”

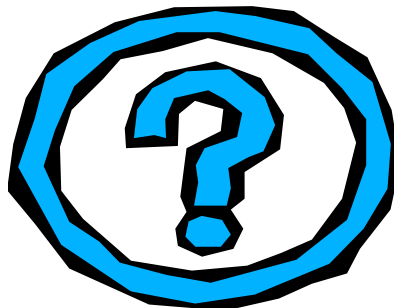


ASEAN = Association of South East Asian Nations

27



What are your “Grand Challenges”



28