Measurement Role in the Development of National Initiatives on Food Safety

Submitted by: APMP
Measurement role in the development of national initiatives on food safety

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Discussion

Two issues involved:

• Protection of food consumers in one’s own country – public health

• Acceptance by international markets of the nation’s export products in food - trade
National Food Safety Issues: The Role of Chemistry/Biology

The usual question society asks, and science answers, to discover if food is safe:

Is a particular substance or organism in the food at levels that imperil the health of anyone that eats it?

Food Safety: The Measurement Questions

- Does food contain material that is known to be harmful to human health?
- If so, what is the level of concentration of that harmful component?
- At that measured level, how do we decide whether that component presents a risk that requires action?
Who Asks These Questions?

Generally, some organisation given the responsibility by government to ensure the safety of the food supply

- National
- Provincial
- Local

In other words, “the Regulator”

Who Answers These Questions?

Generally, some organisation that provides commercial services in analytical chemistry or biology

- Provincial government laboratory
- National government laboratory
- Private sector laboratory

In other words, “the Laboratory”
Food Safety: The Measurement Requirements

• Ability to detect and quantify contaminants
  – Microbiological
  – Inorganic chemical
  – Organic chemical

• Ability to make judgements on detected levels
  – comparison with regulations (national, international)
  – use of measurement uncertainty

Measurement Accuracy

• If we are to make good decisions, it is essential that we know:

  1. that our measurement results are not biased
  2. just what level of accuracy they represent, OR
  3. just what level of measurement uncertainty is associated with them
Who Ensures that the Answers to these Questions are Correct?

A combination of organisations:

- national metrology institute
- international standards setting bodies
- technical accreditation bodies

In other words, “the National Measurement Infrastructure”

But surely most measurements are accurate enough already?
European Study of 129 Laboratories: Lead in wine (Year 2000)

- In this study 131 laboratories submitted results
- Only 34 (26%) agreed with the true value within their stated uncertainty
- Some 56 (43%) were more than 25% wrong
- Some 39 (30%) were more than 50% wrong

Unfortunately, Many Laboratories Can Give Bad Results!

The number of laboratories that were more than 50% wrong exceeded the number that gave the correct result.
So, What’s Missing?

Traceability!!

Measurement result can be connected to some accessible reference of known accuracy.

Accuracy is thereby transferred to the measurement result.

Common References Deliver Traceability

A common reference

Now all four labs have measurement results of known accuracy that they can compare reliably.
What’s Happening on the International Food Scene?

Greater Volumes

World Trade in Rice

Thousands of tonnes

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More Demanding Specifications

International requirements have become more demanding:

For example, EU requirements for minimum detection levels of substances for which there is “zero tolerance”
- 1987  10 parts per billion (ppb)
- 1990  5 ppb
- 1995  2 to 5 ppb
- 2002  0.3 to 2 ppb

Greater Level of Scrutiny

An example:

Japan Vows Better Screening of Chinese Food (DJ)
Source: Dow Jones Newswires

Tokyo, Feb. 4, 2008 - Japan Monday pledged to step up screening of food imports from China amid a nationwide scare over Chinese-made dumplings that left hundreds complaining of illness.

Ten people were diagnosed with pesticide poisoning after eating the frozen meat dumplings, prompting major food makers to recall food products manufactured at the same factory in China.

As Chinese experts held a second day of closed-door talks with Japanese officials, Prime Minister Yasuo Fukuda vowed to strengthen scrutiny of imports.

"This is actually a matter of national security if it is linked to the Japanese people's lives,” Fukuda told a parliamentary committee.

"Considering the current situation in Japan in which exports and imports are increasing - which is essential for Japan in maintaining growth momentum - it's extremely important to have a system of checking the flow of people and goods at the borders," he said.
Greater Level of Scrutiny

A second example:

*Rules would establish 'high risk' list of imported foods*

Food Navigator website 02-Mar-2007

*Proposed rules on imported foods and feeds of non-animal origin would establish a list of products deemed to need higher regulatory scrutiny at the EU's borders.*

*Food and drink processors, among others, would face increased costs and time when importing such "high risk" foods.*

*They would be required to give advance notice when bringing such foods into the EU, and would have to provide more documentation to regulators. They would also have to pay fees for the extra regulatory work.*

Conclusion

- Every economy faces increased requirements for the accurate monitoring of food quality:
  - trade
  - public health

- Need for better national measurement infrastructures

- Need for greater international linkage of measurement standards
Thank you for your attention!