Panel Discussion 1: PT program on nutrient analysis: questions to PTP

MODERATOR: Set 2.	PTP RESPONSE
2A. When did you start organising the PT programme on Nutrient analyses in Thailand	Prapasri Puwastien
2B. What are the factors encouraging you to become a PTP?. How many PT rounds you have been organised.	Table 1. PT Table 2. RM from PT
2C. Please share your experience on problems throughout the PT programme and some suggestion to improve laboratory performance	

Proficiency testing programmed organised by INMU 1989-2016, 12 PT rounds

Round	Year	Nutrients covered	Level
I	1989	Main nutrients, minerals	Regional
II	1993-4	Main nutrients, minerals	Regional
III	1998-9	Mandatory nutrients for NL	Regional
IV	1999-2000	Mandatory nutrients for NL	National
V	2001	Proximate composition	National
VI	2001-2	Total folate	International
VII	2002-3	Mandatory nutrients for NL	Regional
VIII	2005-6	Main nutrients, Fe, Zn, vit B1	International
IX	2009-10	Mandatory nutrients for NL	National
X	2010-11	Mandatory nutrients for NL	National
XI	2013-14	Mandatory nutrients for NL	National
XII	2015-16	Mandatory nutrients for NL	National

Development of food reference materials from PT program, with reference values* of various nutrients

1989	AS-FRM 1 Rice flour AS-FRM 2 Soybean flour	Main nutrients and 8 minerals
1994	AS-FRM 3 Cereal-soy AS-FRM 4 Fish flour-1	Main nutrients and 8 minerals
1998	AS-FRM 5 Weaning food AS-FRM 6 Fish flour-2	Mandatory nutrients for NL (Main nutrients, 3 minerals Cholesterol, Sat. FA, Sugars)
2003	AS-FRM 7 Milk powder	Mandatory nutrients for NL
2005-6	AS-FRM 8 Rice powder	Main nutrients and some minerals
2013	AS-FRM 9 Milk powder	Main nutrients and some minerals for NL

* From good performance laboratories

Uses of RMs:

- Internal quality control system, method validation
- Test material for PT programme in LATINFOODS, SAARCFOODS

Experience from organising PT programme:

Problems, solutions and suggestion throughout the PT programme for improvement of laboratory performance

Proficiency testing programme

1. Selection and preparation of candidate materials*

Rice flour, soybean flour, weaning food, fish powder, milk powder, snacks, whole wheat cracker….

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Sample preparation → sub-samples, packed in sealed containers

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*Followed ISO Guide 34,35, ISO 17043 ISO 5725, ISO 13528

2. Testing for homogeneity and stability of representative nutrients*

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3. Establishing assigned values of nutrients**

1) Expert/outstanding laboratories
[OCEANIA, Europe, USA, Canada]

2) PT participants

**Robust statistics and ISO 13528

Analysis of required nutrients

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Computation and statistical evaluation

↓

Test material with assigned values of nutrients + documents

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4. Proficiency Testing

Followed ISO ISO 17043***

5. Evaluation of laboratory performance

Values from good performance laboratories

↓

6. Reference materials with reference values of nutrients

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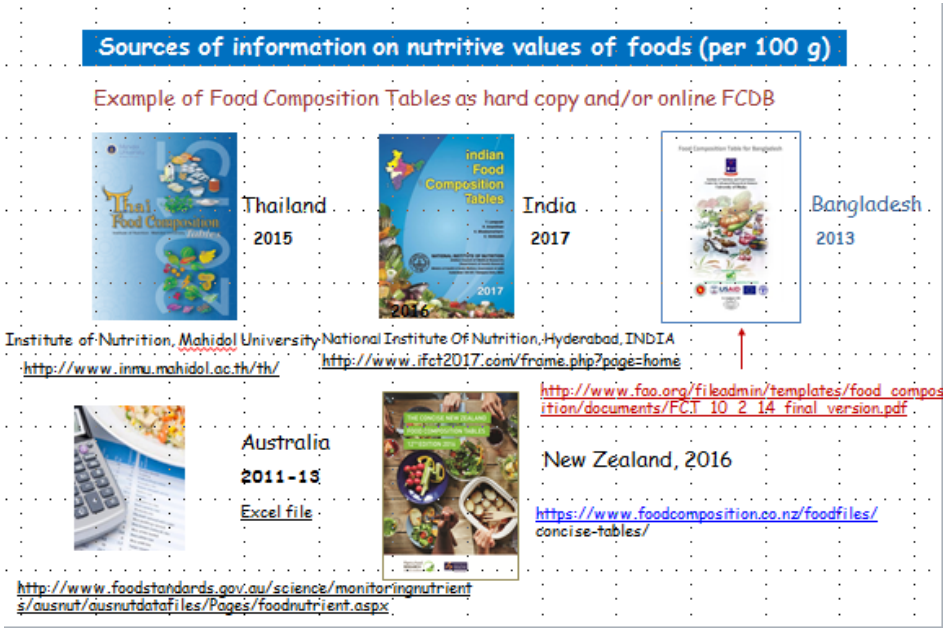
PT programme organised at INMU, 1989-2015: sharing experience

Step 1. Setting objective, selection of target measurands and test material

Target measurands	Selected test materials
1989-1994 (PT-1, PT-2) Main nutrients and minerals	Homogenised single ingredient samples (available on shelf) Plant origin: rice flour, soybean flour, Animal origin: milk powder, fish powder Homogenised food products of mixed ingredients (available on shelf) - instant cereal-soy beverage - weaning food
1998-2006 (PT-3, PT-7, PT-8) Mandatory nutrients for NL: Energy and 13 nutrients: - protein, fat, sat. fat, cholesterol - DF, sugars, - Minerals Na, Ca, Fe. - Vitamins: A, B1, B2 - (ash and moisture, for calculation CHO by difference)	
2009 to 2015: PT-9 to PT-12 Mandatory nutrients for NL	12x commercial packages milk powder 12x packages of instant cereal-soy beverage
	To evaluate the effect of sample preparation on analytical performance 12x commercial packages of salted broad bean + 2x homogenised salted broad bean powder 12x commercial packages of whole wheat cracker + 2x homogenised salted cracker powder

Common problems: Selection of test material and its preparation – suggestion from experience at INMU

Common problems	Possible solutions/key experience
1. Selected test material: a food sample cannot serve all target measurands	Includes test materials from plant and animal origins to cover all mandatory nutrients for NL
2. Some selected test material contain negligible to low amounts of some nutrients by nature → analytical performance cannot be evaluated	Select more appropriate test material for the required measurands, e.g., using brown (unpolished) rice which contains higher levels of lipid, dietary fibre and vitamin B1 than that of white (polished) rice. *Where could we get the information?*



Common problems: selection of test material and its preparation - suggestion from experienced at INMU

Common problems

3. Test material with high fat:
   for example,

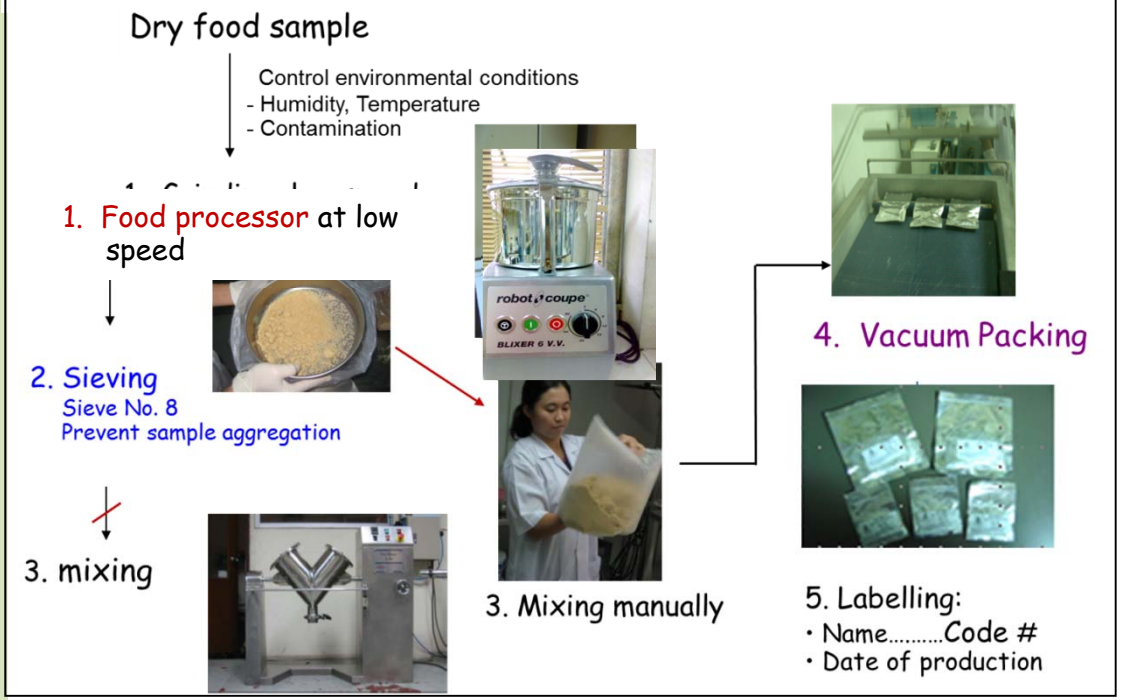
- Salted broad bean:
  total fat 27.8 g/100g,
  moisture 2.79 g/100 g)
- Whole wheat cracker:
  total fat 28.1 g/100 g,
  moisture: 1.80 g/100 g)

caused problems on sample preparation and may affect sample homogeneity and analyses of some nutrients

4. There were two PT rounds:
   participants prepared a single composite sample of test material with high fat, from 12 single samples
   The sample may not be sufficiently homogeneous, which could affect the submitted results.

Possible solutions

Homogenisation of test material with high fat:
e.g., salted broad bean, whole wheat cracker



To verify the possible effect of sample preparation, PT provider sent additional 2 packages of the same high-fat test material which prepared and homogeneity by the PT provider

Suggestions for participating laboratories

How could PT participants achieve good performance in proficiency testing programme ?

PT participating laboratories: Some suggestions

- ☺ Before receiving/opening the test material of a PT programme , search for general nutrient information to get some idea for planning the whole process including sample preparation

- ☺ A trial on the sample preparation may be required, especially for high-lipid containing test material

- ☺ Read carefully all attached documents from PT provider *(e.g., instruction, Results form, units of expression, Summary form for methods used)*

- ☺ Special treatment may be required for analysis of some nutrients in some test materials which must be followed: *e.g., acid hydrolysis prior to organic solvent extraction is required for total fat analysis in sample of plant origin (e.g., cereals, legume seeds and their products); defatted sample is required for analysis of dietary fibre when fat content is ≥ 10 %*

PT participating laboratories: *Some suggestions (cont.)*

- ☺ Proper amount of test material must be used in each analysis
- ☺ Use routine procedures and standard methods for nutrients analyses that fit for special purpose, *i.e., sugars for NL is specified as mono- and di-saccharides, thus results derived from HPLC analysis are acceptable.*
- ☺ Throughout the process of the analysis and before submitting the analytical for printing, *double-check of* the report/your PT results; pay attention to important information related to the quality and reliability of the results: *unit of expression, number of decimal places, conversion factor (e.g., total N to protein)*, etc.

FAO/INFOODS Guidelines for Checking Food Composition Data prior to the Publication of a User Table/Database, Version 1.0, 2012. FAO, Rome, Italy

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INMU-PTP Working team

Thank you for your participation

Additional Question: at the end of the session,If time available

As I know, INMU is not an accredited PT provider. Do you have any specific reasons for not having applied to ISO 17043 accreditation?

Institute of Nutrition,
Mahidol University

Thank you for your attention

Questions -discussion