

## Current status on food composition data system in Thailand

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## Food composition activities in Thailand

1. Current status of food composition database in Thailand
2. Strengthening the performance of laboratories
  - 2.1 Organisation of laboratory performance  
From 1989-present: 10 rounds - see next slide
  - 2.2 Food reference materials with reference values of nutrients  
From 1989-present: 14 RMs
  - 2.3 Organisation of training courses: internal and external quality control system, nutrient analysis - on requested

## FCTs available in Thailand

### Sources of FCD available in Thailand

1. Nutritive values of Thai foods (Thai version)\*  
published by the Nutrition Division, Ministry of Public Health (MOPH). The latest version was published in 2001.
2. Amino acids composition, published by MOPH. \*\*
3. Fatty acids and cholesterol, published by MOPH.\*\*\*
4. Thai Food Composition Tables: first English version, published by INMU in 1999

Electronic versions are available

\* <http://nutrition.anamai.moph.go.th/FoodTable/Html/frame.html>

\*\* <http://nutrition.anamai.moph.go.th/temp/files/book/ชนิดและปริมาณกรดอะมิโนในอาหารไทย.pdf>

\*\*\* <http://nutrition.anamai.moph.go.th/temp/files/book/กรดไขมันและคอเลสเตอรอลในอาหารไทย.pdf>

## Food composition tables: Nutrition Division, MOPH (new: Food Research for Nutrition Section)

2001



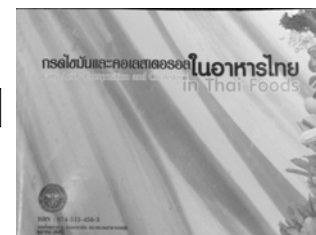
13 food groups, 761 food items:  
18 nutrients

1990



11 food groups, 368 food items:  
18 amino acids,

2002



13 food groups, 3794 food items:  
Cholesterol, total fat and  
21 fatty acids

หน้าแปลกแข็ง พืชเมล็ด ถั่วเมล็ดแห้ง และผลิตภัณฑ์ (Pulses, nuts, seeds and products)

Food ID	Nutrient Composition per 100 g. Edible Portion	Energy	Water	Protein	Fat	Carbohydrate	Density (g/ml)	Ash	Calcium	Phosphorus	Iron	Retinol	Beta-carotene	Total Vit. A	Vitamin E	Thiamin	Riboflavin	Niacin	Vitamin C
Food and Description	Kcal	grams	grams	milligrams	mcg.	RE	milligrams												
03001	กระฉับ, ถั่ว Water chesnut	93	75.9	3.5	0.2	19.3	(0.6)	1.1	15	9	1.2	-	0	0	-	0.36	0.05	1.5	8
03002	กระฉับ, ถั่ว Water chesnut, boiled	165	56.7	4.8	0.2	36.1	(0.8)	2.2	26	16	1.7	-	0	0	-	0.25	0.03	1.3	-
03003	ถั่ว, ถั่ว ถั่ว, ถั่ว	605	3.0	16.1	45.4	33.0	(2.5)	2.5	-	348	tr.	-	15	2	-	0.04	-	2.3	-
03004	เมล็ดถั่ว, ถั่ว Chestnut, raw	217	46.7	3.8	1.8	46.5	(1.1)	1.2	-	-	tr.	-	57	10	-	-	-	2.1	-
03005	งาขาว, ถั่ว Sesame seeds, white roasted	697	3.0	26.1	64.2	3.6	(4.1)	3.1	90	-	13.0	-	4	tr.	-	0.83	1.54	5.0	-
03006	งาขาว, ถั่ว Sesame seeds, white	658	3.9	20.9	57.1	15.0	(4.6)	3.1	86	650	7.4	-	0	0	-	1.08	0.11	3.3	0
03007	งาขี้ม่อน, ถั่ว, จ.แพร์	569	7.2	16.0	42.0	31.7	(19.3)	3.1	442	284	6.3	-	35	6	-	0.49	1.50	1.3	-
03008	งาขี้ม่อน, ถั่ว, จ.เขียงใหม่	600	7.2	16.7	46.5	28.6	(16.7)	1.0	-	-	-	-	84	14	-	0.66	0.22	1.3	-
03009	งาดำ, ถั่ว Sesame seeds, black	603	4.2	20.6	48.2	21.8	(9.9)	5.2	1228	584	8.8	-	0	0	-	0.94	0.27	3.5	0
03010	งาดำ, ถั่ว Sesame seeds, black,	625	2.2	20.6	51.9	18.9		6.4	1469	688	9.9	-	0	0	-	0.75	0.27	3.8	0
	ite	126	56.7	11.1	3.7	12.0	(2.2)	16.5	180	178	15.2	-	0	0	-	0.23	0.08	0.4	-
	te,soft	46	90.0	4.3	1.9	3.0	(0.1)	0.8	250	53	2.2	-	0	0	-	0.04	0.18	0.7	-
		150	69.7	13.5	6.7	8.8	(0.3)	1.3	160	230	2.8	-	-	-	-	0.03	0.18	0.8	-

<http://nutrition.anamai.moph.go.th/FoodTable/Html/frame.html>

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## The First English version Thai Food Composition Tables, 1999



- 16 food groups
- 1050 food items
- 21+3 nutrients
- Analysed data, except CHO (calculation by difference)

Section 1. The concise Thai Food Composition Tables: fresh and processed foods

Section 2. Total fat, saturated fat, cholesterol and sugars

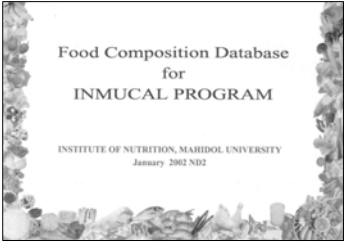
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## Database in INMUCAL



Updated version: January 2006  
Food composition database ND3.3

Source of data:

- Analysed data
- Borrowed data
- Calculated data

- 22 food groups
- 1923 food items
- 26 nutrients

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## Sources of data

Thai FCD -Thai: analysed data at MOPH

Thai FCD -Eng: analysed data at INMU, published journals, books, reports, thesis, unpublished data from various government laboratories in Thailand

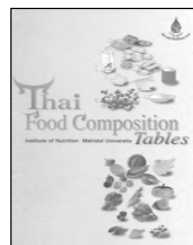
INMUCAL Database: analysed, borrowed and calculated FCD

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Thai FCD – Eng



Food groups: 16

Food code system: Alpha-numeric system

Considered criteria for acceptance: method of analysis

THAI FCTs : 16 Food groups and alphabetic character



Food group	# items	Character
1. Cereals and cereal products	45	A
2. Starchy root, tubers and products	13	B
3. Legumes, nuts, seeds and products	88	C
4. Vegetables and products	249	D
5. Fruits and products	124	E
6. Meat, meat products & other animals	100	F
7. Finfish, shellfish, aquatic animal	168	G
8. Egg and products	16	H
9. Milk and milk products	29	J

THAI FCTs : Food groups and alphabetic character

Food group	# items	Character
10. Fats, oils and products	17	K
11. Sugars, syrup and confectionary	4	M
12. Condiments and spices	64	N
13. Beverages, nonalcoholic	10	Q
14. Fast foods: franchise foods	10	S
15. Mixed food dishes: local	104	T
16. Miscellaneous	24	U

Letter 'I', 'L', and 'O' were excluded, to avoid confusion with the number

Nutrient, criteria of acceptance, INFOODS tagname, and number of decimal places

Nutrients and unit	Criteria of acceptance	INFOODS Tagnames	No. of decimal places
Moisture, g	all methods	WATER	1
Protein, g	total N x converting factor	PROCNT	1
Fat, g	all methods, with acid digestion	FAT	1
Dietary fibre, g	Enzymatic gravimetric method	FIBTG	1
Total available CHO, g (include FIBTG)	calculated by difference: 100g - (total g of water+ protein+fat+ash)	CHOCDF	1
Ash, g	all methods	ASH	1
Energy, kcal	calculated by (4 x g protein)+ (9 x g fat) + (4 x g total CHO)	ENERC	none

Nutrients and unit	Criteria of acceptance	INFOODS Tagnames	No. of decimal places
Calcium, mg	}	CA	none
Phosphorus, mg	}	P	none
Iron, mg	}	FE	1
Sodium, mg	}	NA	none
Potassium, mg	}	K	none
Copper, mg	}	CU	2
Zinc, mg	}	ZN	1
Vitamin B1, mg	} all methods	THIA	2
Vitamin B2, mg	}	RIBF	2
Niacin, mg	}	NIA	1
Vitamin C, mg	}	VITC	none
Vitamin A (Retinol), mg	}	RETOL	none
b-carotene, mg	}	CARTB	none
Total vitamin A (Retinol Equivalent, RE), mg RE	}	VITA	none
Total saturated fatty acids, g	Gas-liquid chromatography	FASAT	1
Cholesterol, mg	Gas-liquid chromatography	CHOLE	none
Sugars, total, g	Sum of free monosaccharides and disaccharides	SUGAR	1

### Calculated data in Thai FCTs

1. Total protein
2. Carbohydrate
3. Energy
4. Total vitamin A (Retinol Equivalent or RE)

Needs information on "conversion factors" and specific factors used for calculation

### Calculated data

1. Crude protein: total N x conversion factor  
see Table 7, page xv

Table 7. Factors for converting nitrogen to protein

Foods	Conversion factors
Milk	6.38
Barley, oats and rye	5.83
Rice	5.95
Wheat flour, refined	5.70
Wheat, whole-kernel	5.83
Almonds	5.18
Peanuts, Brazilnuts	5.46
Soybean	5.71
Nut and seeds, others	5.30
Mixed diet and others	6.25

Jones DB (1941). Factors for converting percentages of N in foods and feeds into percentage of protein, U.S. Dept, Agric, Cir.183,22 pp.

### Calculated data: (continued)

2. CHO: by calculation, include DF  
 $CHO_{CDF} = 100 - \text{moist} - \text{protein} - \text{fat} - \text{ash}$
3. Energy (ENERC): factors used for calculation protein, lipid, CHO = 4, 9, 4 Kcal/g, respectively.

4.  $\beta$ -carotene to total vitamin A or retinol equivalent (RE):  
converting factor

- Nutritive values of Thai foods (MOPH) and Thai FCTs  
 $6 \mu\text{g of } \beta\text{-carotene} = 1 \mu\text{g of RE}$
- INMUCAL:  $12 \mu\text{g of } \beta\text{-carotene} = 1 \mu\text{g of RE}$

• International converting factor: not yet fixed, needs more research on bioavailability (2005)

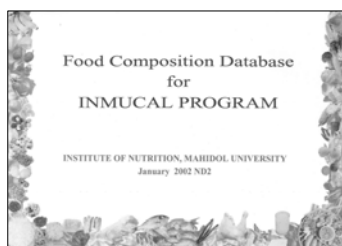
## Used of Thai FCD in Thailand

### THAI FCTs

- Source of nutrient data
- Used mostly by researchers, R&D
- nutrition labelling of fresh and non-processed foods - rare

### INMUCAL Evaluation programme

- **INMUCAL** provides a hard copy of **INMUCAL- FCTs**
- **INMUCAL- FCD**: analysed + borrowed and calculated FCD
- **INMUCAL** is a program used for
  - Estimation of nutrient intake
  - Recipe calculation
  - Development of other related programme - school lunch
  - Dietetics and nutrition counseling
  - etc.



## Food composition activities in Thailand

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## 10 main laboratory performance studies organised by INMU

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

Following ISO Guide 43 and ISO/IEC 17043

## Reference materials with reference values of nutrients

- |               |  |  |
|---------------|--|--|
| <b>1989</b>   | AS-FRM 1 Rice flour<br>AS-FRM 2 Soybean flour  | } Main nutrients and 8 minerals  |
| <b>1994</b>   | AS-FRM 3 Cereal-soy<br>AS-FRM 4 Fish flour-1   |  |
| <b>1998</b>   | AS-FRM 5 Weaning food<br>AS-FRM 6 Fish flour-2 | } Mandatory nutrients for NL<br>(Main nutrients, 3 minerals<br>Cholesterol, Sat. FA, Sugars) |
| <b>2003</b>   | AS-FRM 7 Milk powder                           | Mandatory nutrients for NL   |
| <b>2005-6</b> | AS-FRM 8 Rice powder                           | Main nutrients and some minerals   |
| <b>2009</b>   | FRM 17 Broad bean powder                       | Mandatory nutrients for NL   |

\*Followed ISO guide 34, 35, ISO/IEC 17043 and 13528

## Future activities of THAIFOODS

1. Food composition database
  - Update the Thai FCTs in 2008-2012
2. RMs development and laboratory performance study: continue working
3. Workshop, training courses on:
  - Proficiency testing providers
  - Test material preparation and evaluation
  - Statistical evaluation in PT study
  - Quality control system: internal and external
  - Training course on nutrient analysis: on request
  - Nutrition labelling

# Thank You

