4. COUNTRY REPORT - MALAYSIA
STATUS OF FOOD COMPOSITION STUDIES IN MALYASIA

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INTRODUCTION

A systematic programme to compile a comprehensive Food Composition Table for use in Malaysia was initiated in 1980. Funding was obtained under the ASEAN Protein Project of the Australian - ASEAN Economic Cooperation Programme (AAECP). This analysis and compilation project was undertaken as a collaborative effort between three institutions actively involved in food composition studies, namely the Division of Human Nutrition in the Institute for Medical Research (IMR), the Food Technology Division of Malaysian Agricultural Research and Development Institute (MARDI), and the Faculty of Food Science and Technology of Universiti Pertanian Malaysia (UPM). The rationale behind the initiation of the project, and the progress made have been reviewed in earlier workshop of the Sub-Committee on Protein (Tee, 1981; Asiah Zain and Tee, 1984). Data collected under this collaborative project were compiled to update a previously published food table (Tee, 1982; Tee, 1984).

It is fortunate that under the ASEAN Food Habit Project, the Sub-Committee on Protein continued to show keen interest in food nutrient data generation compilation. Thus, funding for the collaborative project to compile a Malaysian Food Composition Table continued from 1985 till the present. Besides three institutions mentioned above, the Departement of Food Science and Nutrition of Universiti Kebangsaan Malaysia (UKM) also joined in to tackle this huge and seemingly unending task.

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This report identifies several features in the above mentioned collaborative project, relevant to this Workshop. These are grouped into three main areas to encompass: 1. the institutions actively involved in food nutrient data generation; 2. the nutrients and foods analysed: and 3. the methodologies for the analysis of these nutrients. In the concluding remarks, limitations of the project, problem encountered, as well as some areas for feature development are outlined.

It is hoped that will be able to share our experiences and learn from our colleagues from the other member countries of ASEAN who are also actively pursuing reliable food composition tables for their respective countries.

COLLABORATING INSTITUTIONS

The four institutions currently taking part in the collaborative project on compilation of Malaysian Food Composition Table are as follow:

Division of Human Nutrition
Institute for Medical Research,
Jalan Pahang,
50588 KUALA LUMPUR.

Food Technology Division,
Malaysian Agricultural Research & Development Institute (MARDI),
P. O. Box 12301, General Post Office,
50774 KUALA LUMPUR.

Faculty of Food Science and Biotechnology,
Universiti Pertanian Malaysia,
43400 UPM SERDANG.

Department of Food Science and Nutrition,
Faculty of Life Sciences,
Universiti Kebangsaan Malaysia,
43600 UKM Bangi.

Nutrient analysis in each of the above-mentioned institution is beeing carried out by research assis-

tants or laboratory technologiests, under the close supervision of several nutrionists or food scientiests. In the case of the universities, students carrying out research projects are also encouraged to contribute data for this purpose.

Each institution carries out analysis of all the nutrients listed in Table 1 (Section 3) of this report, using a set of common methodologies (to be elaborated in Section 4). The workload is divided among the institutions based on the type of foods analysed. Data generated are scrutinised and then compiled by the Institute for Medical Research (IMR).

The project is currently coordinated by University Pertanian Malaysia (UPM), and efforts are made to achieve a close working relationship. Regular meetings, at least three times a year, are held to discuss progress of the project, and the problems encountered, including technical and financial. Collaborating institutions report on the progress made half-yearly.

Funding for the project is mainly from the ASEAN Food Habits Project, supplemented by the regular budget of the various institutions. laboratory facilities are generally adequate. There is also an understanding among the institutions to assist each other in case of inavailability of certain equipment. In order to develop a pool of expertise in nutrient analysis in the country, technicians and students in the methods of analysis.

Since these institutions are also involved in a variety of other food and nutrition activities, they are also user of the food composition data. The food table is often used as a source of reference in the study of food consumption of communities, formulating diets for special groups, formulation and processing of new food products, teaching purpose, and for advisory purposes. UPM has designed a computer programme, based on data from the table, for calculating nutrient intake of individuals and comparing it with recommended intake.

NUTRIENTS AND FOODS ANALYSED

All the four institutions carry out the analysis of nutrient that are commonly listed in most food

tables. These are given priority and are as listed in Table 1. An example of the format of the Malaysian Food Table is given in Table 2.

Table 1. List of nutrients commonly analyzed by four institutions in Malaysia.

General composition	Vitamins	Minerals
moisture	thiamine	calcium
ash	riboflavin	iron
protein	niacin	phosphorus
fat	ascorbic acid	sodium
crude fibre	vitamin A	potassium
	carotene	

Other nutrients that have been analysed by these institutions include: dietary fibre, amino acid and fatty acid composition, cholesterol, folic acid, sugars, direct determination of energy content, and minor elements such as Zn, Mn, Mg, Pb, Cd, and Hg. These nutrient are however analysed for a relatively limited number of foodstuffs and more for purposes of research studies. Nevertheless, most of these data would be included in the next update of the malaysian food table. Furthermore, there is now greater emphasis on the analysis of these nutrients amongst these institutions, and more data would become available in the feature, particularly for fatty acid and amino acid composition, as well as sugars. It is felt that these nutrient could become "standard" listings in food tables.

Although the bulk of the data compiled to date are those of raw foods, other foodstuffs currently being analysed include cooked meals, processed foods, and various traditional foods in the country. Demand for data on nutrient composistion of cooked and processed foods has been increasing. As mentioned in Section 2 of this report, each institution is assigned to tackle the analysis of each of these types of foods.

Table 2. An example of the format of the Malaysia Food Table

No.	Food Item	Kcal Refuse	Nutrient Composition, per 100 g Edible Portion																		
			Proximate Composition							Minerals					Vitamins						
			% Energy	g Moist.	g Prot.	g Fat	g CHO	g Fibre	g Ash	mg Ca	mg P	mg Fe	mg Na	mg K	ug Ret.	ug Carot.	ug Total A	mg Vit.B1	mg Vit.B2	mg Niacin	mg Vit.C
	10. FISH AND SHELLFISH - (continue)																				
539	Oyster (Tiram); *Ostrea edulis*	-	61	85.2	9	2	1.7	0	2.1	106	-	7.1	-	-	0	1620	270	0.24	0.22	2.60	14.0
540	Painted Sweetlip (Kaci); *Spilotichtys pictus*	57	83	78.2	19.8	0.2	0.5	0	1.3	39	211	0.4	84	365	29	-	29	0.01	0.09	3.10	-
541	(Patong/Kepor); *Pristolepis fasciatus*	52	105	77.4	16.7	3.7	1.2	0	1	48	223	1.5	-	-	-	-	-	0.04	0.39	0.00	-
542	Perch, Climbing (Puyu/ betok); *Anabas testudineus*	54	157	71.4	17	9.4	1	0	1.2	83	239	2.2	-	-	-	0	-	0.04	0.43	1.90	-
543	Perch, Sea (Siakap); *Lates calcalifer*	45	109	75.4	20.1	3.1	0.2	0	1.2	26	195	0.5	35	301	16	0	16	0.05	0.10	2.00	-

Table 2. (continued)

No.	Food Item	Kcal Refuse	Nutrient Composition, per 100 g Edible Portion																		
			Proximate Composition							Minerals					Vitamins						
			% Energy	g Moist.	g Prot.	g Fat	g CHO	g Fibre	g Ash	mg Ca	mg P	mg Fe	mg Na	mg K	ug Ret.	ug Carot.	ug Total A	mg Vit.B1	mg Vit.B2	mg Niacin	mg Vit.C
544	Perch, Giant Sea (Siakap); *Lates calcalifer*	56	83	78.1	19.5	0.1	1	0	1.3	26	220	0.4	76	416	14	0	14	0.20	0.20	2.40	-
545	Pomfret, Black (Bawal Hitam); *Parastromateus niger*	44	95	76.5	20.3	1.4	0.4	0	1.4	39	237	0.5	57	226	48	0	48	0.28	0.18	4.20	-
546	Pomfret, Chinese (Bawal Tambak); *Pampus chinensis*	54	96	78.4	17.7	2.8	0	0	1.3	28	217	0.2	153	283	47	0	47	0.60	0.10	1.90	-
547	Pomfret, White (Bawal Putih); *Pampus argentus*	42	113	76.1	19.3	4	0	0	1.2	16	182	0.5	123	316	27	0	27	0.19	0.09	1.90	-
548	Pomfret, dried	-	174	44.6	34.8	3	1.9	0	1.5	-	-	-	-	-	-	-	-	-	-	-	-

METHODOLOGIES

For the analysis of nutrients listed in Table 1, all four institutions use a common set of methodology. These methods have been adapted and modified from various sources and have been found to be workable through years of experience. A working manual of these methods have been distributed to the institutions. Minor variations may be introduced by the individual laboratory to suit its own need.

Methodology for each of the nutrient analysed shall not be discussed in detail in this report since the workshop sessions will examine these at length. Copies of a recent up date of the above mentioned manual (IMR, 1986) will be made available for later discussions. Methods for the analysis of nutrients other than those listed in Table 1 will also be made available.

Food analysed in the project are usually obtained from retail outlets around Kuala Lumpur and Petaling Jaya. Generally, three samples from three different sources are analysed. Each sample is analysed separately in duplicate. Although it is realised that there are greater variations for cooked meals, neither time nor money permit study on more than there samples, in duplicate, of these foods.

In order to maintain quality of food composition data, constant supervision of the analysts is undertaken. Recovery studies are carried out wherever possible. In addition, data are scrutinised prior to acceptance for compilation.

CONCLUDING REMARKS

With the completion of the current phase of the Food Habits Project in 1987, the collaborative project for the compilation of a Malaysian Food Composition Table would also have concluded yet another stage of the project satisfactorily. It is anticipated that by the end of next year,, substantial amount of new data would have been generated. A second update to the original table will be made, and a fairly comprehensive Malaysian Food Table will be available to all users.

It would appear that a start has been made in this area. It is therefore time to consider future steps to be taken. Thus far, emphasis has been given to the compilation of a table for *immediate* use. The limited resources available - expertise, financial and time - did not premit closer scrutiny of the data, and the analysis of a wider range of other nutrients. Future developments and emphasis would thus be in these areas.

Several aspects with regards to the usefulness of the data generated need to be examined. Quality of the data would be foremost in the mind of most food analysts. Present quality control measures are clearly not adequate. Although the four institutions in the project are using similar methodologies, there has to be a regular monitoring of inter-laboratory variations of the results obtained. Consultations and discussions amongst laboratories could greatly help to keep such variations to a minimum level. In addition, the use of external food reference materials would greatly improve the quality of data.

The second aspect relates to the representativeness of the data. Greater care should be made towards obtaining random samples of foodstuffs. Samples of foods produced in other parts of the country should also be analysed.

A third aspect in relation to the usefulness of the data generated pertains to terminology and nomenclature of the foods analysed. Proper documentation of the foods has been a problem and greter attention will have to be paid to this.

In relation to the nutrients analysed, there is now increasing interest amongst the institutions to analyse a wider range of minerals and vitamins for food composition data. It is now necessary to pay greater attention to these data due to increasing demand.

Another area that the group plans to give greater attention is the mechanism of compilation of food composition data. Currently, the data generated are stored in a micro-computer, using a commercial software package. Plans are being made to improve the computerisation of data storage and retrieval.

The implementation of these plans would necessarily be dependent on resources available. Human resources are viewed to be most important. Technical expert-

ise will have to be upgraded to meet this increasing sophistication in data generation and compilation. A motivated and dedicated staff is the best asset a laboratory can have.

The above has touched on some aspects for the improvement of nutrient composition data generation within the country. In a wider context, in line with the objectives of this workshop, much could be gained from collaboration amongst ASEAN countries. This report will not dwell into the various areas of collaboration as the organisers have outlined these very well, and the group discussion sessions will spell out the details. This group look forward to learning from our colleagues in the ASEAN countries, and participating in the various collaborative programmes to be identified.

REFERENCES

Asiah M. Zain and Tee E. Siong (1984). *Use of analytical techniques in food research in Malaysia*. Report of the 2nd ASEAN Workshop on Food Analytical Techniques, 19-24 March 1984, Surabaya, Indonesia.

IMR (1986). *Laboratory procedures in nutrient analysis of foods*. Division of Human Nutrition, Institute for Medical Research, Kuala Lumpur.

Tee E. Siong (1981). *Techniques in the analysis of nutrients in Malaysian foods - a review*. Report of the 1st ASEAN Workshop on Food Analytical Techniques, 12-14 February 1981, Singapore.

Tee E. Siong (1982). *Nutrient composition of Malaysian foods: a preliminary table*. Division of Human Nutrition, Institute for Medical Research, Kuala Lumpur.

Tee E. Siong (1985). *Nutrient composition of Malaysian foods: a preliminary table (1st update)*. ASEAN Protein Project-National Sub-Committee Malaysia, Kuala Lumpur.

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