



Use of the Reference Material derived  
from APFAN PT-1 for Quality Control  
System in the Study of Nutritive  
Values of Ethnic Foods  
(Rakhine and Shan)

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Quality control in Food Laboratory

Internal quality control system:

- Precision: in-house QC sample/control chart
- Accuracy: CRMs, SRMs, RMs

External quality control system: proficiency

- testing (laboratory performance study)

Ref: Assoc.Prof. Kunchit Judprasong Internal Quality Control System

Validity/Accuracy

- is about determining whether something does what it is supposed to do

Precision

- Also known as reproducibility, repeatability, reliability all mean that the results of a test or measure are identical or closely similar each time it is conducted



**Both accurate and precise**



**Precise but not accurate**



**Neither accurate nor precise**

- Because of variation in laboratory procedures, observers, or changing conditions of test subjects (such as time, location), a test may not consistently yield the same result when repeated



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### Internal quality control in laboratory

- set of procedures undertaken by the staff to ensure quality of reports
- total process beginning with sample collection up to final reporting

### Standard Operating Procedures (SOP)

- **= comprehensively written document that describes the laboratory procedure and all other related issues**
- **Essential for ensuring uniformity in laboratory procedures**

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#### External Quality Assessment(EQA)

- According to the ISO definition, EQA (also known as 'proficiency testing' (PT) or 'EQ Control = EQC') refers to : a system of objectively checking laboratory results by means of an external agency including comparison of a laboratory's result at intervals with those of other laboratories the main objective being the establishment of trueness

#### Laboratory-performance study(Proficiency testing)

- **Objective:** to assess the performance of a laboratory (ies) [or analyst (s)]
- **Activities:** a group of laboratories analyse one or more components of one or more homogenous and stable testsamples by the methods used or selected by each laboratory.
- **Outcome:** status of laboratory performance, selection of methods for specific analysis, development of consensus values of analytes (?)



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# Participating Analytical Proficiency Testing (PT) to Improve Food Laboratory Analyses

## Nutrients analysed in APFAN!

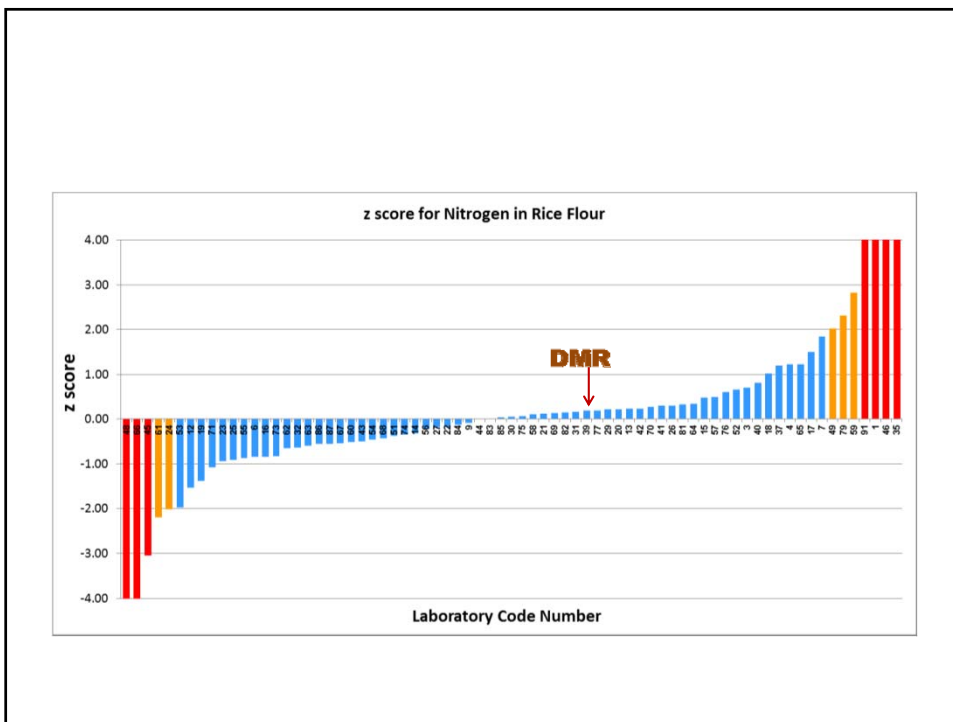
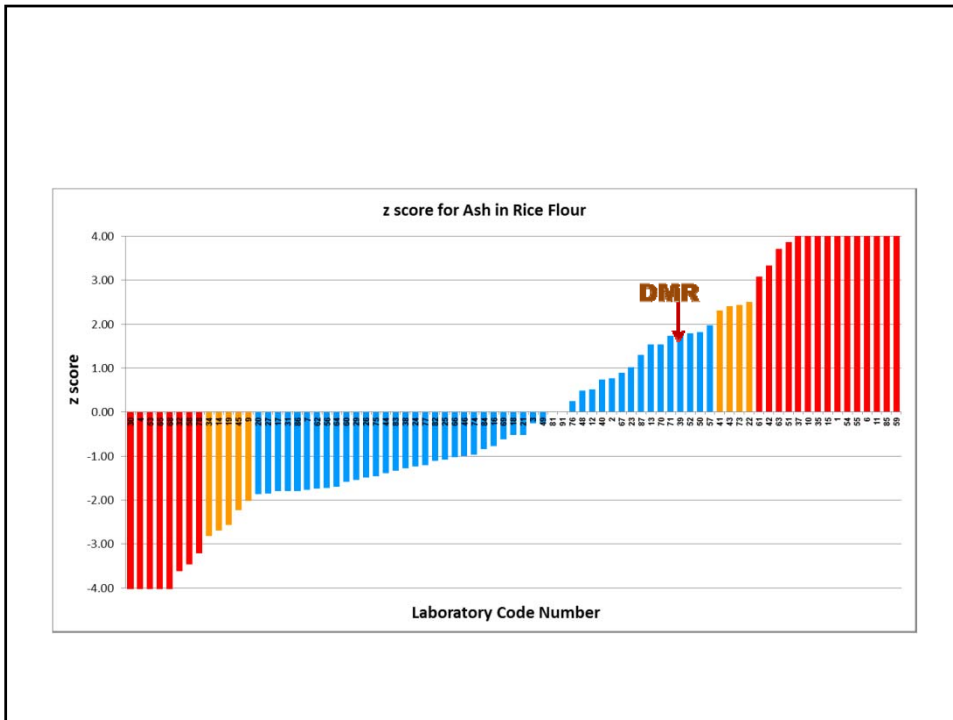
- Determination of **moisture** by Air Oven
- Determination of crude protein by Kjeldhal Method
- Determination of **total fat** by manual extraction
- Determination of **ash** by Gravimetric method

Reference: Regional Centre of ASEAN network of Food Data System. Institute of Nutrition, Mahidol University, Thailand, 2011. ASEAN Manual of Food Analysis.

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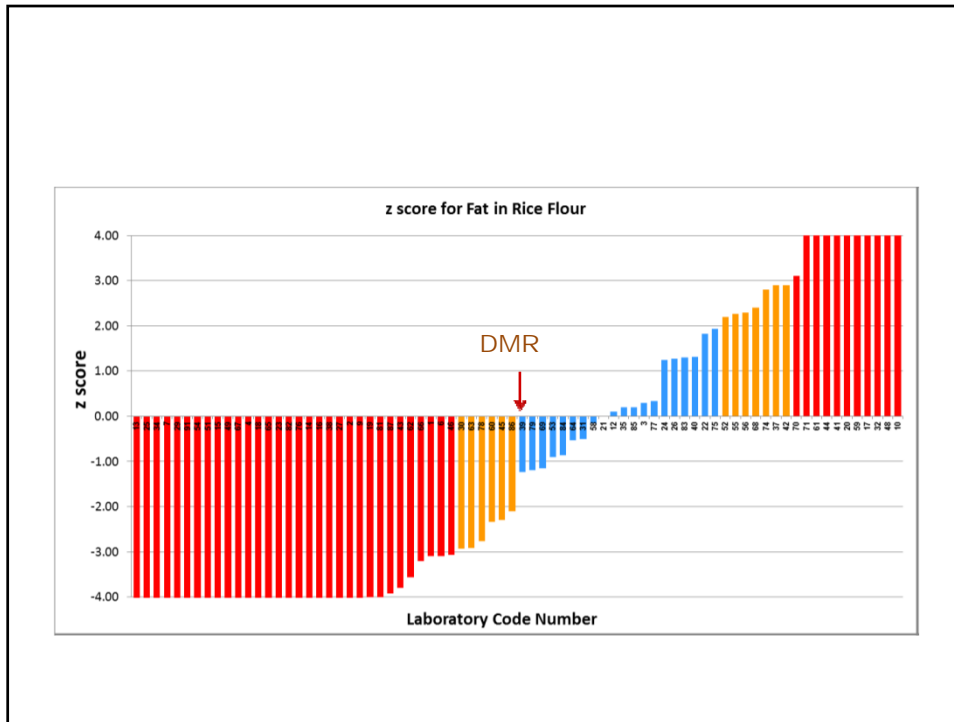
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**Nutrient content of selected ethnic foods (Rakhine and Shan) from food shops in Yangon**

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**Background and Justification**  
During the present socio-economic transition period in Myanmar, various kinds of foods are producing in great numbers.  
Current lifestyles, the choice and availability of foods, are influencing the eating patterns.  
There is a growing evidence that globalization and trade liberalization have played a key role in the dietary and nutrition transition in the developing.  
With the advent of food biotechnology and the expansion of transnational food corporations (TNCs), global food chain has undergone massive changes in terms of the ways food is grown, processed, stored, transported and consumed.  
Food miles (the distance that food travels from the place of production to reach consumer's table as a result of improved transportation systems and changing trade partners (1)).  
The way of the world in social media and today there is no question of whether or not people are going to use social media, it's a question of what types of social media one will use.  
There are many different forms of social media used by businesses, governments and the general public.  
Yangon is growing city which is due mainly to the rapid growth of population. Urbanization affects people's health and diet in various ways. People from different area of country has been drawn to Yangon for economic points of view. Therefore, there are appearance of ethnic food shops restaurants around the city of Yangon.  
Nutrient values of these food are important for calculation of nutrient intake in consumers, and provision of hard data in formulating dietary guidelines and nutrition education.

**Objectives:**  
**General Objective:**  
To find out the nutrient values of Rakhine and Shan foods from selected food shops in Yangon.  
**Specific Objectives**  
To determine the nutrients, macronutrients(carbohydrate, protein, fat) of Rakhine and Shan foods from selected food shops in Yangon.  
To explore the calorie content of Rakhine and Shan food per 100g.

**Methodology**  
**Study design**  
Descriptive study to explore the nutrient values of available Rakhine and Shan food from food shops in Yangon.  
**Study area**  
Laboratory analysis was done in Food and Nutrition Laboratory, Nutrition Research Division, Department of Medical Research.  
**Sample collection and Method**  
The name of Rakhine and Shan food establishments in Yangon municipal are were collected through social media advertisement.  
Social media advertisement include journals, magazines, website and Facebook.  
From the list obtained, 7 each of (Rakhine and Shan) food shops restaurants were randomly selected.  
A total 70 of Rakhine and Shan foods were bought from selected food shops restaurants in Yangon.  
The food will be classified as Rakhine food (Kachawadee/haung food, mauxian food, braun food, vegetable food and mixed dishes.)  
Shan food (Kachawadee/haung food, mauxian fish based food, vegetable food and mixed dishes.)  
Determination of total protein were done by the estimation of nitrogen by Kjeldahl method using Gerhardt semi-microanalysis analyzer (2).  
Fat content were determined by crude ether extraction of dry sample (2).  
The content of available carbohydrate were determined by difference, which is by subtracting from 100 to the sum of the values per 100 grams for protein, fat, moisture, ash).  
The calorie content of food were described per 100g.

**Findings**  
The results of the survey pointed out 50 kinds of food, which were then categorized into rice and noodle based food (12 recipes), meat fish based food (13 recipes), vegetable based food (17 recipes) and mixed dishes (3 recipes).

**Table (1) The type of analyzed identified foods.**

Food Type	Number of Recipes
Rice based food	12
Noodle based food	13
Vegetable based food	17
Mixed dishes	3
<b>Total</b>	<b>45</b>

**Table (2) Nutrient values of Rakhine food per 100g**

Food Name	Energy (kcal)	Protein (g)	Total Fat (g)	Total Carb (g)	Total Fiber (g)
Mauxian food	142.0	11.0	4.0	19.0	0.0
Kachawadee/haung food	133.0	7.0	3.0	19.0	0.0
Braun food	170.0	11.0	4.0	21.0	0.0
Mauxian fish based food	165.0	11.0	4.0	21.0	0.0
Vegetable based food	108.0	4.0	1.0	17.0	0.0
Mixed dishes	108.0	4.0	1.0	17.0	0.0
<b>Total</b>	<b>626.0</b>	<b>48.0</b>	<b>17.0</b>	<b>104.0</b>	<b>0.0</b>

**Table (3) Nutrient values of Shan food per 100g**

Food Name	Energy (kcal)	Protein (g)	Total Fat (g)	Total Carb (g)	Total Fiber (g)
Mauxian food	142.0	11.0	4.0	19.0	0.0
Kachawadee/haung food	133.0	7.0	3.0	19.0	0.0
Braun food	170.0	11.0	4.0	21.0	0.0
Mauxian fish based food	165.0	11.0	4.0	21.0	0.0
Vegetable based food	108.0	4.0	1.0	17.0	0.0
Mixed dishes	108.0	4.0	1.0	17.0	0.0
<b>Total</b>	<b>626.0</b>	<b>48.0</b>	<b>17.0</b>	<b>104.0</b>	<b>0.0</b>

**Table (4) Comparison of calorie content of Rakhine and Shan food**

Food Type	Rakhine Food (kcal/100g)	Shan Food (kcal/100g)
Rice based food	115.00	115.00
Noodle based food	137.50	137.50
Vegetable based food	108.00	108.00
Mixed dishes	108.00	108.00
<b>Total</b>	<b>468.50</b>	<b>468.50</b>

**Discussion**  
Most of the Rakhine food in this study were low in fat and energy levels. Compared with Shan food.  
Calories of Rakhine food showed a variation between 50.15/100g and 162.0/100g.  
Fat content of Rakhine food showed a variation between 0.9g/100g and 14.0g/100g.  
The highest calories content was found in bean noodle salad while the lowest was in water spinach salad.  
The highest fat content was found in ery ground and bamboo shoot curry while the lowest is in water spinach salad.  
Calories of Shan food showed a variation between 11.72 /100g and 149.0/100g.  
Fat content of the Shan food showed a variation between 0.02g/100g and 19.0g/100g.  
The highest calories content was found Shan style fried fish while the lowest was in fermented mustard soup.  
The highest fat content was found in food vegetable linear while the lowest was in fermented mustard soup.

**Conclusion and Recommendations**  
The majority of traditional Rakhine food is based on curries, soup and salad and the majority of Shan food is based on steamed food, soup, salad and fried food.  
The nutrient value of the dishes reveals a high variation in nutrient composition.  
The nutrient value of Rakhine and Shan food in this study could not represent the food from Rakhine, Shan and Shan state.  
The data can be useful for calculation nutrient intake.  
The further study is needed to analyze the regional food from Rakhine and Shan state.

**References**  
1. Shwe S, Nyein U, Myint Ayein, et al. Self-sufficiency in rice and food security in South Asian perspective. *Archives of Food Science*, 2012, 2: 35.  
2. *Principles of Food Analysis*, 7th Edition, Pearson, Institute of Nutrition, Mahidol University, Thailand, 2004.

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