

## Review

# Taking the Indonesian nutrition history to leap into betterment of the future generation: development of the Indonesian Nutrition Guidelines

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Nutrition history in Indonesia began in 1887, when Christiann Eijkman discovered the relationship between vitamin B-1 deficiency and beri-beri. In the 1950's, the socialization of nutrition messages started with the introduction of "Healthy Four Perfect Five" (*Empat Sehat Lima Sempurna-ESLS*). For the next 25 years after that, ESLS became a favorite in nutrition education and was nationally known. Although the ESLS was never evaluated, food consumption pattern of Indonesians are never balanced. Undernutrition is rampant and overnutrition emerged. In 1995 the Indonesian food-based dietary guidelines was launched by the Ministry of Health, and formally incorporated into the nutrition policy. The Guide has 13 messages. Again, the guidelines were never evaluated; in 2010 undernutrition persists and the prevalence of degenerative diseases increased. Thus, it is urgent for Indonesia to have concrete Nutrition Guidelines (*Gizi Seimbang*) covering messages like: (1) consume a variety of foods; (2) keep clean; (3) be active, exercise regularly; and (4) monitor body weight. The guidelines shall be developed for all age groups. The guidelines were tested to over 300 audiences and the responses were promising. Dissemination of the messages widely within the formal channels is compulsory. The new Nutrition Guideline messages are an open concept ready to be revised accordingly. It is evident that nutrition sciences and its application had undergone rapid changes over time and Indonesia need to adopt accordingly and timely. Although, outcomes may not be seen in a short time, longer term output will benefit future generations.

**Key Words:** Dietary Guidelines, Indonesia, history, nutrition, nutrition guidelines

## INTRODUCTION

Nutrition history in Indonesia began in 1887, when Christiaan Eijkman discovered the relationship between vitamin B-1 deficiency and beri-beri in Batavia (now Jakarta, the capital).<sup>1</sup> About 8 decades afterward, starting in the 1950's and throughout the 21<sup>st</sup> century, nutrition in Indonesia has taken many forms. In 1950, Institute of Nutrition (*Lembaga Makanan Rakyat*) was established, followed by the establishment of Health Polytechnics (*Akademi Gizi*) in 1953, the inclusion of nutrition science into Medical School curriculum of the first University in Indonesia (*Indonesia University-UI*), in 1955; and later in 1958 by Bogor Agriculture University (*Institut Pertanian Bogor-IPB*). On the same year, the first Professor in Nutrition, Prof. Poerwo Soedarmo MD., was recognized nationally, followed by the establishment of the Nutrition Division of Medical School of UI (1960) and Department of Community Nutrition and Family Resources at IPB in 1976. This was followed by other state universities in 4 cities Makassar, Yogyakarta, Surabaya, and Padang. The establishment of five Nutrition professional associations between 1957 to 2005 enriched the movement of Nutrition within the country.

In the history of the development of nutrition science globally, in the 1970s through the 1990s, Indonesia has contributed significantly. The country has reached its golden age of nutrition, whereby nutrition science was developed and applied at the public and community level

and made contribution to the improvement of the wellbeing of the people.<sup>2</sup> Prominent researches have been published in international journal and cited widely up to now. These included iron supplementation and productivity studies in 1970's.<sup>3</sup> The Vitamin-A and infant mortality study in Aceh in 1980's,<sup>4</sup> Complementary feeding and Cognitive development of Infant and Children under the age of five in the late 1980 and 1990s.<sup>5</sup> To top it off, nation-wide community nutrition programs was forcefully implemented. These were: (1) "Family Nutrition Improvement program" (locally known as *Usaha Perbaikan Gizi Keluarga-UPGK*), which covered holistic activities to improve economy, consumption, and nutritional status monitoring; (2) the establishment of village weighing posts (locally known as *Pos Pelayanan Terpadu-Posyandu*), which included the recruitment of health volunteer (cadres), in 1975 throughout the 1990s; (3) community-based school feeding program (locally known as *Pemberian Makanan Tambahan Anak Sekolah-PMTAS* (1994-1997) and (4) a four-yearly National Food and Nutrition Workshop (locally known as *Widya Karya*

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*National Pangan dan Gizi-WNPG I-IX (1969-2008)*. In the 1970's through 1990's, nutrition had been explicitly recognized in the main stream of national development, especially in human development.

#### DEVELOPMENT OF NUTRITION GUIDELINES

The socialization of nutrition messages started in the 1950's when Prof Poerwo Soedarmo MD, known as the father of nutrition in Indonesia, introduced the term "Healthy Four Perfect Five" (locally known as Empat Sehat Lima Sempurna-ESLS). The slogan was developed to educate people about the importance of nutrition. The message is a modification of the United State's (US) "Basic Seven and Basic Four".<sup>6,7</sup> This slogan is depicted in a circle form, with staple (carbohydrate source), side dish (protein and fat sources), vegetables, and fruits (vitamin and mineral sources) on the outside and milk in the middle. For the next 25 years, ESLS became a favorite in nutrition education and was nationally known, especially in school-age children. Its values are inherited among the public even until today.<sup>8</sup>

As time passes by, new nutrition knowledge and facts forced countries to revisit their messages. Nutrition messages in many Asian countries in 1990's must not focus on food only, but also consider other factors such as water and environmental sanitation, physical exercise, and smoking and alcohol.<sup>9</sup> The ESLS, which inadvertently gave higher values for milk, produced a problematic situation for the government of developing nations because of its unavailability locally and high price. Moreover, ESLS did not contain messages on portion size or quantity of foods that must be consumed for each food groups. The US, for example, had revised its Dietary Guidelines from that of promoting health and preventing nutritional deficiencies in the 1970's to that of preventing chronic diseases in the 1980's, and that of including balance intake and physical activity in 2005 and 2010.<sup>10</sup> The assumption of that ESLS would make Indonesia practice a healthy food habit and be healthy was not materialized, as with the experience in the US. On the contrary, food habits of American were getting worse, with high intakes of fat, sugar, salt, and low intakes of fiber. Although the ESLS was never evaluated, it is obvious that the food consumption pattern of Indonesians were not balanced, as undernutrition was rampant and overnutrition emerged. Unfortunately, there was never any evaluation of the effect of ESLS on knowledge, attitudes, and practice of the public with regard to healthy eating.

Although about 20 years too late, the government of Indonesia introduced the term "Guide to Balance Diet" in 1993 (locally known as Pedoman Umum Gizi Seimbang-PUGS). This was due to a commitment of countries to the International Conference on Nutrition in 1992. In 1995 the guide was launched by the Ministry of Health (MoH)<sup>11</sup> and formally incorporated in the nutrition policy and program of the 4<sup>th</sup> five year plan known as REPELITA VI (1994-1998). Information in the guidelines was based on research results carried out by the Nutrition Center for Research and Development, MoH. The Guide has 13 messages, namely: (1) food variation, (2) eat food with sufficient energy, (3) consume complex carbohydrate for energy, (4) energy from fat and oil should only provide

25% of the total energy, (5) use only iodized salt, (6) eat iron-rich foods, (7) give exclusive breast milk to infants 0-4 month (now 0-6 month), (8) eat breakfast daily, (9) drink sufficient clean and safe water, (10) regular sport for fitness, (11) avoid alcoholic drink, (12) eat clean and safe food, and (13) always read food labels.

The pictorial representation of the guidelines is a universal pyramid with three layers: (1) bottom layer: energy sources, (2) middle layer: fruit and vegetables, (3) top layer: animal and plant protein source food. In 2002, the cone was modified to four layers, with energy source foods, vegetables and fruit, animal and plant protein, and sugar and salt, from the bottom to the top layer respectively. In addition, the following revisions were made: (1) separation between animal and plant proteins, in which milk is included in the animal protein group, (2) addition of sugar and salt, (3) inclusion of suggested amount for consumption (servings), (4) fats and oils were not included in the guide, and (5) message no. 7 was revised to "Provide only breast milk for baby until four months old, after which breast milk should be supplemented with complementary foods". For the next eight years after that, no real attempt was made to revise the guidelines, nor socialize healthy eating and physical wellbeing. Starting with the new era of the reformed government (1998-2004), nutrition science and its application were declining and nutrition lost its identity.<sup>12</sup> At the same time, the dietary guidelines were dormant, less socialized, not adopted in nutrition education at schools, and unpopular both among the public and nutrition professionals. Some industries still advertised the old ESLS slogan. A recent study covering 132 elementary school children found out that 90% stated that balance diet is equivalent to Healthy 4 Perfect 5.<sup>8</sup> This showed that the new pyramid guide is not known.

As in many other countries, the prevalence of undernutrition in Indonesia is declining. However, the trend of obesity and degenerative diseases increased. The increase prevalence of non-communicable disease indicators should raise concern: hypertension 32%, stroke 6%, heart 7%, diabetes mellitus 6%, and glucose intolerance 10%.<sup>13</sup> The prevalence of overweight and obesity is astonishingly similar across age groups: 12% in children under the age of five (defined as WFH >2 SD), 10% in male and 6% in female 6-9 years (defined by BMI >2 SD); 19% for 15 years and above (defined as BMI 25-27 and >27 respectively). Furthermore, the practice of unhealthy lifestyles was high. Most people (94%) age 10 years and above do not consume enough fruit & vegetable, i.e. consuming less than 5 portions of vegetables and/or fruit per day within the week. This practice is relatively similar across age groups, sex, education levels, urban/rural area of residence, and quintile capita per day expenditure. About half (48%) of the population age 10 years and above do not take part in enough physical activity, i.e. at least 10 minutes per activity and 150 minutes for 5 days within a week. This situation is similar to that experienced by the US in the 1970's. Thus, it is time to reposition nutrition in the upcoming national and regional mid-and-long term development policies.

## WHAT MESSAGES TO CONVEY TO PROFESSIONALS AND THE PUBLIC

Having mentioned all of the above, thus, it is urgent for Indonesia to have concrete nutrition guidelines, covering not only dietary, but also non-dietary messages. My colleagues and I propose to call it Nutrition Guidelines or locally called principles of “*Gizi Seimbang*”. The following messages are essentials to be included in the guidelines: (1) consume variety of food; (2) keep clean; (3) be active, exercise regularly; and (4) monitor body weight. It is important to convey common message that nutritional status is not merely related to food only, but also to cleanliness and sanitation, physical activity, and ideal stature. The guidelines shall be developed for all age groups, starting with infancy, young and school aged children, adolescents, adults, including pregnant and lactating mothers, and the elderly. Breastfeeding and infection are still center issues for Indonesia. Exclusive breastfeeding until 6 months of age, continue breastfeeding up to 24 months, and education to promote breastfeeding and prevent infection should be part of the nutrition guide to prevent undernutrition. Breastfeeding and physical activity are both relevant messages to prevent obesity.

The popular and traditional “pyramid-like” cone, (locally called *Tumpeng*) will be used as pictorial representation of the nutrition guidelines. The *Tumpeng* is a ceremonial serving of a complete menu in a large plate made of bamboo with a narrow-space cone on the top of the “pyramid”. The menu consists of yellow rice, complete with vegetable salad, egg, chicken, fish, and beef, for 5 to 10 people for each serving. The “*Tumpeng Gizi Seimbang*” (TGS) shall consist of five layers (from top to bottom): fat-sugar-salt, vegetable and animal protein source, vegetables and fruits, staple food, and drinking water (Figure 1). The cone is placed in a large tray as its base, decorated with symbols of washing hand, various exercises, i.e. cycling, jogging, swimming, and a person with

a weighing scale. With these decorations, it is hope that TGS could convey the four principles of healthy life style: variety of Food to meet individual requirement, cleanness and food safety, regular activity and sport, and ideal weight monitoring.

My colleagues and I tested this new Nutrition Guidelines in front of over 300 audiences that consisted of elementary, secondary and high schools teachers 28%, university students 14%, health care professionals 12%, housewives and community workers (locally known as *PKK*) 12%, university lecturers 11%, government officials & civil servants 10%, reporters 9%, and others that included industry, NGO and UN agency representatives. The responses were promising. About two-third of the respondents (68%) had the opinion that the four principle messages were very informative and easy to understand (n=353) (unpublished data). Most respondents (88%) agreed that the four principles were clearly depicted in the TGS (n=363). From the four principles, about half of the participants (42%) mentioned that consuming variety of food was the easiest to practice, followed by personal hygiene (38%), monitoring body weight (18%), and physical activity (9%) (n=359). When asked about proposed slogan, the top four words that came up were: Balance Diet/Nutritional Guidelines (*Gizi Seimbang or berimbang*) 86%, healthy/fit/strong (*sehat/kuat/bugar*) 52%, smart/achiever/better life (*cerdas/berprestasi/kreatif/mandiri/unggul*) 49%, and future generation (*generasi masa depan*) 15%. About half of the respondents think that the most effective way in socializing the nutritional guidelines is through educational institutions (54%) and radio/television (50%). Other methods were less suggested: brochure/leaflet (15%), newspaper and government (each 11%). From various levels of education, most respondents (91%) answered elementary school as the best channel, followed by junior high (19%), high school (11%), and university (9%); (n=359). Aware-



Figure 1. Proposed pictorial presentation of the Nutrition Guidelines “*Tumpeng Gizi Seimbang*”

ness of the principles “physical activity” and “monitor body weight”, as well as information about servings and their examples should be socialized more. The dissemination resulted in 48 articles in newspapers, magazines, tabloids, and e-news written by journalists. Financially, the articles in total are worth 1 billion rupiah (approximately USD 100,000) of advertisement. This shows that reporters, the media, and the readers could be effective disseminator of the new messages. The Ministries of Education, Agriculture, and Health recognized that the guidelines are good reference educational materials for the public.

### **CHALLENGES: HOW DO WE KNOW IF THE MESSAGES ARE EFFECTIVE**

Effectiveness of any nutrition guidelines ideally should be measured by trend of changes in knowledge, attitudes and practice in food consumption behavior and diseases. To measure behavior output requires the implementation of national or regional household dietary or food consumption studies, periodically. In the long run (5-10 years) it should be followed up by measuring the impact of epidemiological transition of diseases to see if dietary and disease patterns are changing. The challenge is the availability of existing knowledge, attitude, and practice (KAP) and food consumption data as the baseline. If there are no relevant data available, national or regional sample data should be collected. The constraint most of the time is cost, including in Indonesia. Studies like this require high level accountable commitment for nutrition. Unfortunately, the national basic health research 2007 has no food consumption data at the household level. It is expected that the KAP study on food consumption is considered in future research.

The second challenge is how to disseminate the messages widely within the formal channels, such as schools, health services, and agriculture extensions. Endorsement by the Minister of Health, Education, and Agriculture not only in writing, but also in action is crucial. The new nutrition guideline messages are an open concept ready to be revised accordingly, at least every five years as it is in the US. It is evident that nutrition sciences and its application undergo rapid changes over time and Indonesia need to adopt accordingly, and timely. Although, outcomes may not be seen in the short term, longer term output will benefit future generation.

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### **AUTHOR DISCLOSURE**

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## 以印尼營養歷史躍進下一世代的改善：印尼營養指南的發展

印尼的營養歷史始於 1887 年，Christiann Eijkman 發現維生素 B1 缺乏與腳氣病的相關性。在 1950 年，營養資訊的社會化開始於 “Healthy Four Perfect Five” (Empat Sehat Lima Sempurna-ESLS) 的簡介。歷經 25 年後，ESLS 變成一個受營養教育喜愛且被全國廣泛認識。雖然 ESLS 從未被評估、印尼的飲食攝取模式從未平衡。營養不良是無法控制，而營養過剩是拉緊報的。在 1995 年印尼食物基礎飲食指南由衛生部開始籌劃辦理，且正式的與營養政策結合。這個指南包含 13 項訊息。但是，這個指南從未進行評估；在 2010 年營養不良的問題持續，而退化性疾病的盛行率增加。因此，印尼急需具體的營養指南(Gizi Seimbang)轉換資訊如：(1)攝取多樣性的食物；(2)保持乾淨；(3)規律的活動及運動；和(4)監測體重。這個指南將發展至所有年齡層。這個指南有超過 300 名聽眾做過測試並回覆這是可行的。營養資訊廣泛的透過正式管道宣傳是必要的。這個新的營養指南資訊是一個開放性的概念並準備依此去修正。經證實營養科學和它的應用已經歷隨著時間推移的快速轉變，印尼需要依此並適時的採納意見。雖然，結果無法在短時間看見，但長時間的成果將是對下一代有益的。

**關鍵字：**飲食指南、印尼、歷史、營養、營養指南