REPORT ON REGULATORY STATUS OF MICRONUTRIENT FORTIFICATION IN SOUTHEAST ASIA

ILSI SOUTHEAST ASIA REGION REPORT SERIES

ILSI
International Life Sciences Institute

The International Life Sciences Institute (ILSI) is a non-profit, worldwide foundation based in Washington, DC, USA established in 1978 to advance the understanding of scientific issues relating to nutrition, food safety, toxicology, risk assessment and the environment. ILSI accomplishes its work through its branches and the ILSI Research Foundation.

Established in 1993, ILSI Southeast Asia Region facilitates and coordinates scientific programs, research and information dissemination in Southeast Asia, Australia, New Zealand and the Pacific Islands. Based in Singapore, ILSI Southeast Asia Region also oversees a Country Office in Australia and Country Committees in Indonesia, Malaysia, Philippines and Thailand.

By bringing together scientists from academia, government, industry and the public sector, ILSI seeks a balanced approach to solving problems of common concerns for the health and well-being of the general public. ILSI receives financial support from industry, government, and foundations.

This publication, published in December 2011, is made possible with the support of the ILSI Southeast Asia Region Food Fortification Task Force. The Task Force facilitates data collection on food fortification programs and regulations in the Southeast Asian countries. It also facilitates research on fortification technologies, as well as the evaluation of effectiveness and safety of fortification programs in collaboration with national research institutions and regulatory agencies in Southeast Asia, and the ILSI Center for Health Promotion.

REPORT ON REGULATORY STATUS OF MICRONUTRIENT FORTIFICATION IN SOUTHEAST ASIA

Authors
Mia Isabelle, Pauline Chan, Steffiana Y. Wijaya

International Life Sciences Institute Southeast Asia Region Report Series

Table of Contents

1. Background

Micronutrient malnutrition presents a public health problem in some industrialized nations, but even more so in the developing regions of the world (WHO & FAO, 2006). Deficiencies in iron, vitamin A and iodine are the most prevalent worldwide. Together, these micronutrient deficiencies affect at least one third of the world's population, the majority of who are in developing countries.

Policy and program responses to micronutrient malnutrition include (a) food-based strategies such as dietary diversification and food fortification, (b) nutrition education, public health and food safety measures, as well as (c) supplementation (WHO & FAO, 2006). Dietary diversification through nutrition education has been the foundation of long-term strategies, but its implementation may be relatively time-consuming, given a lack of resources and education, and difficulties in changing food habits. Micronutrient supplementation often results in rapid improvements in the micronutrient status of target groups; however, supplementation approaches have faced problems of cost, poor compliance, and inefficient delivery of supplements. Food fortification, on the other hand, tends to have a less immediate but nevertheless a much wider and more sustained impact. Micronutrient fortification of commonly consumed foods, such as staples and condiments, has been shown to be a cost-effective strategy for the control of micronutrient malnutrition in the medium and long-term (WHO & FAO, 2006).

1.1. Definition and Purpose of Fortification

According to the Codex General Principles for the Addition of Essential Nutrients to Foods, fortification or enrichment is defined as "the addition of one or more essential nutrients to a food whether or not it is normally contained in the food for the purpose of preventing or correcting a demonstrated deficiency of one or more nutrients in the population or specific population groups" (Codex Alimentarius, 1991). The Codex General Principles further states that fortification should be the responsibility of national authorities since the kinds and amounts of essential nutrients to be added and foods to be fortified will depend upon the particular nutritional problems to be corrected, the characteristics of the target populations, and the food consumption patterns of the area.

Conditions for the fulfillment of any fortification program include: (a) a demonstrated need for increasing the intake of an essential nutrient in one or more population groups, either through actual clinical or subclinical evidence of deficiency, estimates indicating low levels of intake of nutrients, or possible deficiencies likely to develop because of changes taking place in food habits; (b) the food selected as a vehicle should be consumed by the population at risk; (c) the intake of the food vehicle should be stable and uniform with known lower and upper levels of intake; (d) the amount of the essential nutrient added to the food should be sufficient to correct or prevent the deficiency when the food is consumed in normal amounts by the population at risk but also not result in excessive intakes by individuals with a high intake of a fortified food (Codex Alimentarius, 1991).

WHO and FAO Guidelines on Food Fortification with Micronutrients offers a wider perspective on the definition of food fortification – "the practice of deliberately increasing the content of essential micronutrients (vitamins and minerals including trace elements) in a food so as to improve the nutritional quality of the food supply and to provide a public health benefit with minimal risk to health". The public health benefits of fortification may be either demonstrable, or indicated as potential or plausible by generally accepted scientific research, and include: (a) prevention, risk minimization or contribution to the correction of occurrence of micronutrient deficiency in a population or specific population groups; (b) a potential for improving nutritional status and dietary intakes that may be, or may become, suboptimal as a result of changes in dietary habits/lifestyles; and (c) plausible beneficial effects of micronutrients consistent with maintaining or improving health (WHO & FAO, 2006).

1.2. Recommendations and Regulations of Micronutrient Fortification

The World Health Organization (WHO) and Food and Agriculture Organization of the United Nations (FAO) have extensively reviewed the best recommendations for food fortification, and have provided specific technical advice as indicated (WHO and FAO, 2006). For instance, WHO and FAO have issued specific recommendations for the fortification of flour due to its wide consumption (WHO et al, 2009). Flour is a food vehicle especially important for the fortification of iron, which is seen as the micronutrient most associated with deficiency. An expert panel recently noted that many fortification programs of flour with iron have not significantly reduced iron deficiency, often due to the low bioavailability of the iron compound (Hurrell et al, 2010). Compliance with the WHO-FAO guidelines (which incorporate the expert panel recommendations) increases the likelihood of measurable reductions in micronutrient deficiencies.

According to WHO-FAO (2006), fortification provisions in food law should ensure that all compositional parameters applicable to both fortificants and food vehicles deliver safe and appropriately efficacious public health outcomes, and that the labeling and claims of fortified foods are factual, and provide sufficient information to enable appropriate consumption.

The scope of regulatory provisions related to fortification may, however, differ from country to country. Some countries adopt mandatory and voluntary fortification regulations as part of an overall nutrition policy to address certain nutrient deficiencies that may be a cause of concern. On the other hand, other countries may regulate voluntary fortification of nutrients without having explicit nutrient deficiency eradication goals; rather, regulation of voluntary fortification intends to make permissible the increment of nutrient levels in the fortified food, in comparison with the naturally-occurring amount. Regulations are set to control the claims on the nutrient content of these fortified foods.

1.3. ILSI Southeast Asia Region: Fortification Programs

Over the past 15 years, the International Life Sciences Institute (ILSI) Southeast Asia (SEA) Region has been involved in addressing issues and challenges in micronutrient deficiencies in the region. In 1996, it organized the Regional Conference on Food Fortification in cooperation with the Philippines national authorities, which prompted the Manila Declaration calling for a multisectoral partnership to control micronutrient deficiencies through food fortification.

From 2000 to 2004, ILSI SEA Region collaborated with international bodies such as the United Nations and the United Nations Children's Fund (UNICEF), as well as regional organizations such as the Asian Development Bank, to facilitate a series of workshops to address food fortification strategies to combat micronutrient deficiencies in both adults and young children in SEA.

As part of ILSI's global Project IDEA (Iron Deficiency Elimination Action), which aims to reduce iron deficiency anemia in developing countries by adding iron to foods such as staples and condiments, ILSI SEA Region has been working with ILSI Japan Center for Health Promotion on food fortification programs in Cambodia, the Philippines and Vietnam since 2005. Fish-sauce has been fortified with iron in Vietnam, while iron-fortified rice has been tested in the Philippines, and both fish-sauce and soy-sauce have been fortified with iron in Cambodia.

2. Survey on Status of Micronutrient Fortification Regulations

With the implementation of programs for micronutrient fortification of staples and condiments, national authorities across SEA have developed regulations that require mandatory fortification of certain nutrients, and voluntary fortification of others. The scope and extent of fortification policies and programs, as well as national regulations governing fortification, vary significantly throughout the region.

To assist all stakeholders – including national bodies and regulators, industry, researchers and scientists across Southeast Asia to better understand the status of food fortification programs and regulations in the region, ILSI SEA Region conducted a year-long survey on the regulatory status of mandatory and voluntary fortification of micronutrients in Southeast Asia region, particularly those involving staple foods and condiments. The information gathered through this survey will help to identify some of the gaps for prioritization of future activities in this area; it is hoped that the survey findings will be useful to stakeholders in planning and implementation of food fortification strategies within and between SEA countries.

2.1. Survey's Scope and Methodology

This survey considered three types of fortification regulations: (a) those related to addressing nutrient deficiencies; (b) those related to voluntary addition of nutrients; and (c) those related to nutrient content claims. Regulations for targeted fortifications e.g. those targeting infants and young children were not included in this survey.

A survey form setting out information on relevant regulations, obtained through published regulation documents and references, was circulated to the regulatory agencies of 10 SEA Region countries:

- Brunei Darussalam
- Indonesia
- Malaysia
- The Philippines
- Thailand
- Cambodia
- Laos
- Myanmar
- Singapore
- Vietnam

The survey was sectioned into three parts: (a) respondent detail; (b) survey form on the regulatory status of various nutrients; and (c) the monitoring and evaluation of these voluntary or mandatory regulations. For each nutrient included in the survey, the survey requested for information on:

- Fortificant
- Food Vehicle
- Status (Mandatory / Voluntary)
- Minimum Acceptable Level
- Maximum Tolerable Level
- Labeling Requirement (e.g. logo/symbol)
- Nutrient Content Claims Permitted & Conditions for Claim
- Nutrient Comparative Claims Permitted & Conditions for Claim
- Nutrient Function Claims Permitted & Condition for Claim
- Disease Risk Reduction Claims Permitted & Conditions for Claim
- Regulating Body
- Regulation Name
- Issue Date

Regulators were requested to verify the information pertaining to food fortification regulations stated in the survey, as well as to provide any updates and additional information on other micronutrients and their monitoring and evaluation systems, where available. As of July 2011, the final confirmation of the report has been obtained from the National Agency for Drug and Food Control (BPOM), Indonesia, the Agri-Food and Veterinary Authority (AVA), Singapore, and the Thai Food and Drug Administration (FDA).

Information about the addition of nutrient supplements, claims on fortifications, and other relevant information pertaining to the regulations have been included in this report as well.

3. Summary of Survey Findings on Micronutrient Fortification Regulations

3.1. By Country

3.1.1. Brunei Darussalam

No mandatory fortification regulation has been instituted.

However, the country's Public Health (Food) Act (Chapter 182) states provisions for the addition of nutrient supplements, which are defined as any amino acid, mineral or vitamin which, when added either singly or in combination with food, improves or enriches the nutrient content of food. The list of permitted nutrient supplements is available in the Twelfth Schedule of the Act (Attorney General's Chamber Brunei Darussalam, 2001). Provisions of voluntary fortification claims allow products to bear fortification claims when a specified reference quantity of the fortified food contains not less than a half of the daily allowance of the fortificant. The RDA value of the vitamins (including vitamin A, C, D and E, B vitamins and folate) and minerals (including iodine, iron, calcium and phosphorus) as well as the reference quantity for each food category is specified in its Food Act (Attorney General's Chamber Brunei Darussalam, 2001).

3.1.2. Indonesia

Regulatory authorities stipulate mandatory fortification of salt with iodine (Ministry of Industry, Republic of Indonesia, 2005) and mandatory fortification of wheat flour with iron, zinc, folic acid, vitamins B1 and B2 (Ministry of Health, Republic of Indonesia, 2003; Ministry of Industry, Republic of Indonesia, 2011).

Provisions of voluntary micronutrient fortification claims in food products are that products are only allowed to bear fortification claims when the fortified food contains an increased level of vitamins or minerals of not less than 10% of the Indonesian recommended daily allowance (AKG) as compared to the reference food (BPOM, Indonesia, 2005).

The nutrients with specified provisions for voluntary fortification claims include vitamins A, C, D, E, K, B vitamins and folate, as well as minerals including iron, potassium, calcium, magnesium, manganese and selenium. The AKG value for use in nutrition labeling differs for the general consumer and for infants, children, and pregnant and lactating women (BPOM, Indonesia, 2007).

3.1.3. Malaysia

Mandatory fortification of salt with iodine is instituted in certain regions of Malaysia.

The country's Food Regulations 1985 also states provisions for the addition of nutrient supplements, which refer to any mineral, vitamin, essential amino acid or essential fatty acid which, when added either singly or in combination to food, improves or enriches the nutrient content of food. The list of permitted nutrient supplements is available in the Twelfth Schedule (Legal Research Board, 2009).

Provision of voluntary fortification claims states the minimum amounts of nutrient that need to be provided by the fortified food, depending on the food category (Table S1). The maximum amount of each nutrient in terms of intake units per day is also stipulated in the regulation (Legal Research Board, 2009). The nutrients with specified provisions for voluntary fortification claims include vitamins A, C, D, E, B vitamins and folate, as well as minerals including iron, calcium and phosphorus.

3.1.4. The Philippines

The Philippines' Guidelines on Micronutrient Fortification of Processed Foods, define fortification as "the addition of nutrients to processed foods or food products at levels above the natural state. As an approach to control micronutrient deficiency, food fortification is addition of a micronutrient, deficiency in the diet, to a food which is widely consumed by specific at-risk groups". The Guidelines were set in recognition of the nutritional deficiency problems observed through a nutrition survey in the Philippines. The deficiencies include energy, iron, vitamin A, thiamin, and riboflavin, as well as ascorbic acid, calcium and folate to a minor extent (FDA Philippines, 1995).

The government stipulates mandatory fortification of rice with iron, salt with iodine, wheat flour with iron and vitamin A, refined sugar with vitamin A, and cooking oil (except those for export) with vitamin A.

The Philippines FDA also regulates voluntary fortification of micronutrients and its claim by stating the minimum nutrient content of the fortified food, depending on the deficiency status of the particular nutrient in the Filipino diet, the establishment of its Recommended Daily Allowance (RDA), level of toxicity, etc (FDA Philippines, 1995; FDA Philippines, 2000). The RDA value for each nutrient is provided in the regulation.

The nutrients with specified provisions for voluntary fortification claims include vitamins A, C, D, E K, B vitamins and folate, iron, potassium, calcium, copper, magnesium, manganese and selenium.

3.1.5. Singapore

No mandatory fortification regulation has been instituted. However, the country's Sale of Food Act (Chapter 283) Food (Amendment) Regulations 2011 states provisions for addition of nutrient supplements, which are defined as "any amino acid, mineral or vitamin, which when added either singly or in combination with food, improves or enriches the nutrient content of food." The list of permitted nutrient supplements is available in the Seventh Schedule (AVA, Singapore, 2011).

Provision of voluntary fortification claims states that the fortified food per specified reference quantity is required to contain at least 50% of the daily allowance of the nutrient. The Recommended Daily Allowance (RDA) value of vitamins (including vitamins A, C, D, B vitamins and folate) and minerals (including iodine, iron, calcium and phosphorus) as well as the reference quantity of each food category is specified in the regulation (AVA, Singapore, 2010).

3.1.6. Thailand

The Thai FDA stipulates mandatory fortification of salt with iodine, condensed milk and margarine with vitamin A, and vitaminized rice with vitamins B1, B2 and B3 (FDA, Thailand, 1993, 2000 & 2002).

Provisions of voluntary fortification claims states that products are only allowed to bear fortification claims when they contain increased levels of vitamins or minerals of not less than 10% of the Thai Recommended Daily Intake (RDI), as compared to the reference food (FDA, Thailand, 1998). It is also stipulated that the RDI value for Thais of ages 6 years and up is to be used as criteria for displaying of nutrition value on food labels. The nutrients with specified provisions for voluntary fortification claims include vitamins A, C, D, E, K, B vitamins and folate, iron, zinc, calcium, phosphorus, magnesium, copper, potassium, manganese, selenium, fluoride, molybdenum, chromium and chloride.

3.1.7. Vietnam

Regulatory authorities stipulate mandatory fortification of salt with iodine (Flour Fortification Initiative, 2009).

The Ministry of Health launched the Technical Regulation No. 6289/2003/QD-BYT on Food Fortification which provides guidance on the specifications and level of fortificants for voluntary fortification of certain foods – including wheat flour with iron, folic acid, zinc, thiamine and riboflavin, fish sauce with iron, and sugar and vegetable oil with vitamin A (Dao & Huong, 2008).

3.1.8. Cambodia, Laos, Myanmar

Universal salt iodization is the only known provision made on fortification in these countries (UNICEF & FFI).

3.2. By Nutrient

3.2.1. Iodine

Iodization of **salt** remains the most common mandatory fortification in SEA Region, except in Singapore, Brunei Darussalam, and certain parts of Malaysia. Regulation of salt iodization programs in Southeast Asia, including minimum acceptable levels and maximum tolerable levels, is shown in Table 1A.

Thailand recently gazetted mandatory iodization of **fish sauce, hydrolyzed/fermented soy sauce,** and **brine for cooking**, with minimum and maximum levels of 2 mg/l and 3 mg/l, respectively, for fortification using potassium iodate.

The Philippines also regulates voluntary fortification of **processed foods** that contain at least 40 kilocalories per normal serving with iodine at minimum and maximum levels of 33% and 150% of the RDA for the target consumers, respectively.

The provisions for fortification claims on iodine in countries including Brunei, Indonesia, Malaysia, Singapore and Thailand are shown in Table 1B. The detailed stipulations for claims on fortification of specific food types with iodine in Malaysia are shown in Table S1.

3.2.2. Iron

Regulation of iron fortification programs is shown in Table 2A. Fortification of **wheat flour** is mandatory in Indonesia and the Philippines, and voluntary in Vietnam.

The Philippines FDA also mandates iron fortification of **rice** (except brown rice and locally produced glutinous rice). Staple foods fortified with iron at the stipulated levels are eligible for the Diamond Sangkap Pinoy Seal logo in the Philippines. The Philippines FDA also regulates voluntary fortification of **processed foods** that contain at least 40 kilocalories per normal serving; products which meet the fortification requirements are eligible for the Sangkap Pinoy Seal logo as well.

Regulatory authorities in Vietnam regulate the voluntary iron fortification of **fish sauce**.

The provisions for fortification claims on iron in countries including Brunei, Indonesia, Malaysia, Singapore and Thailand are shown in Table 2B. The detailed stipulations for claims on fortification of specific food types with iron in Malaysia are shown in Table S1.

3.2.3. Vitamin A

Regulation of vitamin A fortification programs in SEA is shown in Table 3A. The Thai FDA implements mandatory vitamin A fortification of **condensed milk** and **margarine**. The Philippines FDA also implements mandatory vitamin A fortification of **wheat flour, refined sugar** and **cooking oil**.

The Philippines FDA states provisions for voluntary fortification of **processed foods** with vitamin A and beta carotene. Additionally, the Vietnamese Ministry of Health regulates voluntary fortification of sugar and vegetable oil.

The provisions for fortification claims on vitamin A in countries including Brunei, Indonesia, Malaysia, Singapore and Thailand are shown in Table 3B. The detailed stipulations for claims on fortification of specific food types with vitamin A in Malaysia are shown in Table S1.

3.2.4. Folic Acid and B Vitamins

Regulation of B vitamins fortification programs is shown in Table 4A. The Indonesian BPOM stipulates mandatory fortification of **wheat flour** with folic acid, vitamin B1, and vitamin B2. The Vietnamese Ministry of Health stipulates regulations for voluntary fortification of wheat flour as well.

The Philippines FDA states provisions for voluntary fortification of **processed foods** with B vitamins, while the Thai FDA states provisions for mandatory fortification of **vitaminized rice**.

The provisions for fortification claims on folic acid and B vitamins in Malaysia, Singapore, and Brunei, Indonesia and Thailand, are shown in Tables 4B, 4C and 4D, respectively. The detailed stipulations for claims on fortification of specific food types with B vitamins in Malaysia are shown in Table S1.

3.2.5. *Zinc*

Regulation of zinc fortification programs is shown in Table 5. **Wheat flour** fortification with zinc in Indonesia is mandatory, while that in Vietnam is voluntary.

The Philippines FDA regulates voluntary fortification of **processed foods** with zinc.

Regulatory authorities in Indonesia and Thailand state provisions for fortification claims on zinc as well.

3.2.6. *Other Vitamins and Minerals*

Provisions for voluntary fortification of all other vitamins and minerals in the Philippines (Table 6A), Brunei (Table 6B), Indonesia (Table 6C), Singapore (Table 6E) and Thailand (Table 6F) are shown in the respective tables.

Provisions for voluntary fortification of other vitamins and minerals in Malaysia are shown in Table 6D, and the minimum amounts of nutrients for fortification claims are shown in Table S1.

These micronutrients include vitamins C, D, E and K, as well as calcium, chloride, chromium, copper, fluoride, magnesium, manganese, molybdenum, phosphorus, potassium and selenium.

4. Summary of Survey Findings on Monitoring and Evaluation Processes

Monitoring is crucial to ensure compliance with the stipulated regulations on micronutrient fortification. Since governments have a vital role in ensuring public health, compliance with food fortification regulations, as well as the effective implementation of food fortification programs need to be monitored and evaluated continuously to ensure maximum benefits to target groups and the safety of all consumers (WHO & FAO, 2006). External monitoring by governmental food control authorities should combine technical auditing (checking the performance and the records of the producers' quality assurance procedures) and inspection (confirming that the technical specifications for the products are being met at factories, packaging sites, and points of entry into the country). These procedures can be added to existing food safety regimes. It would be necessary to verify whether the monitoring systems are actually being implemented, and to understand the levels of compliance to the regulations. Only Cambodia, Indonesia, Malaysia and the Philippines have provided information on their monitoring systems as seen in Table 7A and Table 7B.

Impact evaluation is also crucial to determine whether or not the food fortification regulations and programs have achieved their objectives of improving the nutritional status of the target populations (WHO & FAO, 2006). Impact evaluation is, however, rarely performed as it is perceived to be complex and costly. Most of the countries do not have such evaluation processes, and do not conduct reviews of the effectiveness of their regulations.

The actual status of micronutrient deficiencies is not well established in many SEA population segments. It is often not a standard practice to check for these deficiencies in routine medical examinations; in the case of pregnant women, anemia will be measured but not true iron deficiency. It is important to establish a well-grounded basis for estimating the actual micronutrient deficiencies in the target populations.

5. Conclusion and Recommendations

Salt iodization, iron and vitamin A fortification in staples are the most common forms of mandatory fortification in the Southeast Asia region. Zinc and B vitamins fortification are also mandatory in some countries. Most countries have individual regulations on voluntary fortification with various vitamins and minerals. The stipulated fortification amounts, fortification vehicles, as well as the level of regulation differ from one country to another in varying degrees, creating a complex regulatory landscape.

Monitoring compliance is crucial to ensure maximum benefit to target groups and safety of all consumers, while evaluation is needed to assess the impact of fortification on the nutritional status of the target populations; addressing these two aspects within the SEA context would be crucial for fortification regulations and programs to achieve their intended purpose.

6. References

Agri-Food & Veterinary Authority of Singapore. (2010). *A Guide to Food Labelling and Advertisements*. Retrieved from: http://www.ava.gov.sg/NR/rdonlyres/B96B0EC2-1D1E-4448-9C25-ABD8470D2BF4/18008AGuidetoFoodLabellingandAdvertisements2.pdf

Agri-Food & Veterinary Authority of Singapore. (2011). *Sale of Food Act (Chapter 283) Food (Amendment) Regulations 2011*. Retrieved from: http://www.ava.gov.sg/NR/rdonlyres/0CA18578-7610-4917-BB67-C7DF4B96504B/18969/52aweb_SOF_FoodAmendmentRegulations2011.pdf

Attorney General's Chamber Brunei Darussalam. (2001). *Public Health (Food) Act (Chapter 182)*. Retrieved from: http://www.agc.gov.bn/agc1/images/LOB/PDF/Cap182subRg1.pdf

Codex Alimentarius Commission. (1991). *General Principles for the Addition of Essential Nutrients to Foods CAC/GL 09-1987 (amended 1989, 1991). Rome, Joint FAO/ WHO Food Standards Programme, Codex Alimentarius Commision, 1987*. Retrieved from: http://www.codexalimentarius.net/download/standards/299/CXG_009e.pdf

Dao TM, Huong BT. (2008). *GAIN Report: Vietnam FAIRS Country Report Annual 2008*. Retrieved from: http://www.fas.usda.gov/gainfiles/200809/146295727.pdf

Flour Fortification Initiative. (2009). *Position Paper on Wheat Flour Fortification in Vietnam*. Retrieved from: http://www.sph.emory.edu/wheatflour/ealg_vietnam_09/vietnam_draft_postition_paper.pdf

Food and Drug Administration Thailand. (1993). *Notification of the Ministry of Public Health No.150 / 2536(1993) Vitaminized Rice*. Retrieved from: http://www.qmaker.com/fda/new/images/cms/top_upload/1141827715_No150.pdf

Food and Drug Administration Thailand. (1998). *Notification of the Ministry of Public Health No.182 / 2541(1998) Nutrition Labelling*. Retrieved from: http://www.fda.moph.go.th/eng/eng_food/Notification/182-41.pdf

Food and Drug Administration Thailand. (2000). *Notification of the Ministry of Public Health No.207 / 2543(2000) Margarine*. Retrieved from: http://www.qmaker.com/fda/new/images/cms/top_upload/1147229817_207-43%20Margarine_update_.pdf

Food and Drug Administration Thailand. (2002). *Notification of the Ministry of Public Health No. 265 / 2545 (2002) Cow's Milk*. Retrieved from: http://www.qmaker.com/fda/new/images/cms/top_upload/1148400308_265-45(1).pdf

Food and Drug Administration Philippines. (1995). *Administrative Order No. 4-A s. 1995, Guidelines on Micronutrient Fortification of Processed Foods*. Retrieved from: http://www.bfad.gov.ph/pdf/RegulatoryGuidance/food/ao/AO4-As1995.pdf

Food and Drug Administration Philippines. (1995). *Republic Act No. 8172, An Act for Salt Iodization Nationwide*. Retrieved from: http://www.bfad.gov.ph/oldsite/republic%20acts/RA%208172%20-%20Asin%20Law.pdf

Food and Drug Administration Philippines. (2000). *Republic Act No. 8976, Philippine Food Fortification Act of 2000*. Retrieved from: http://www.doh.gov.ph/ra/ra8976

Hurrell R, Ranum P, de Pee S, Biebinger R, Hulthen L, Johnson Q, Lynch S. (2010). *Revised recommendations for iron fortification of wheat flour and an evaluation of the expected impact of current national wheat flour fortification programs*. Food Nutr Bull., 31(1 Suppl): S7-21. Iodine Network. *Country Profile: Vietnam*. Retrieved from: http://www.iodinenetwork.net/countries/Vietnam.htm

Legal Research Board. (2009). *Food Act 1983 (Act 281) & Regulations*. Malaysia: International Law Book Services.

Ministry of Health, Republic of Indonesia. (2003). *Ministry of Health Decree No 1452/MENKES/SK/X/2003, Wheat Flour Fortification*. Retrieved from: http://www.depkes.go.id/downloads/Sk1452-03.pdf

Ministry of Industry, Republic of Indonesia. (2011). *Ministry of Industry Decree No. 35/M-IND/PER/3/2011, Mandatory Enforcement of Indonesian National Standards of Wheat Flour as Food Substance*. Retrieved from: http://sisni.bsn.go.id/index.php?/sni_main/sni_amand/unduh2/9640

National Agency for Drug and Food Control, Republic of Indonesia. (2005). *Functional food*. Retrieved from: http://pom.go.id/public/hukum_perundangan/pdf/SK%20PanFUNGSI%20.pdf

National Agency for Drug and Food Control, Republic of Indonesia. (2007). *Reference Value for Nutrition Labeling of Food*. Retrieved from: http://aimi-asi.org/wp/wp-content/files/bpom/AcuanLabelGizi.bpom2007.pdf

President of Republic of Indonesia. (1994). *President Decree No 69 Year 1994, Iodized Salt Procurement*. Retrieved from: http://legislasi.mahkamahagung.go.id/docs/KEPPRES/KEPPRES_1994_69_PENGADAAN%20GARAM%20BERYODIUM.pdf

UNICEF & FFI. *Nutrition and Food Fortification Status in Participating Countries*. Retrieved from: http://www.unicef.org/eapro/FFI_Regional_Participating_countries_fact_sheet.pdf

WHO and FAO. (2006). *Guidelines on food fortification with micronutrients*. Retrieved from: http://www.who.int/nutrition/publications/guide_food_fortification_micronutrients.pdf

WHO, FAO, UNICEF, GAIN, MI, & FFI. (2009). *Recommendations on wheat and maize flour fortification. Meeting Report: Interim Consensus Statement*. Retrieved from: http://www.who.int/nutrition/publications/micronutrients/wheat_maize_fort.pdf

Table 1A. Salt Iodization in SEA

	Cambodia	Indonesia	Laos	Malaysia	Myanmar	Philippines	Thailand	Vietnam
Fortificant	Potassium iodate, Sodium iodide, Potassium iodide	Potassium iodate	Potassium iodate	Potassium iodate, Potassium iodide, Sodium iodate, Sodium iodide	Potassium iodate	Potassium iodate	Potassium iodate	Potassium iodate
Food Vehicle	Salt	Edible salt for human consumption	Salt	Salt	Salt for human and animal consumption	Food-grade salt for human or animal consumption	Edible salt, except those manufactured for export	Edible salt for human consumption
Status	Mandatory	Mandatory	Mandatory	Mandatory for certain regions in Malaysia	Mandatory	Mandatory	Mandatory	Mandatory
Minimum Acceptable Level	50-60 mg/kg at the producer level; 30-60 mg/kg at the retail level	30 mg/kg	40-60 mg/kg at the factory level and >20 mg/kg at the household level	-	40 mg/kg in the plant; 15 mg/kg in household	20 mg/kg	30 mg/kg	20 mg/kg at the household level
Maximum Tolerable Level	-	-	-	200mcg /day	-	70 mg/kg	100 mg/kg	-
Labeling Requirement (e.g. logo/symbol)	-	SNI mark	-	-	-	Diamond Sangkap Pinoy Seal for Staples	-	-
Nutrient Content and Comparative Claim Permitted	-	Yes	-	Yes, follow CODEX	-	Yes, follow CODEX, criteria based on Philippines RENI	Yes, format similar to Codex, criteria based on Thai RDI	-
Nutrient Function Claim Permitted	-	Yes	-	Essential for the formation of thyroid hormone Conditions: meet the criteria for "source of" claim	-	Yes, follow CODEX	*Unofficial translation:* an integral part of the thyroid hormones which regulate growth and development of body and brain functions	-
Disease Risk Reduction Claim Permitted	-	Not permitted	-	Not permitted	-	Yes, follow CODEX	Not permitted	-
Regulating body	Ministry of Commerce	Ministry of Industry	Food and Drug Department of Ministry of Health	Food Safety and Quality Division - Ministry of Health Malaysia	Myanmar Salt and Marine Chemicals Enterprise of the Ministry of Mines	Department of Health through Food and Drug Administration (FDA) Philippines	Food and Drug Administration	Ministry of Health
Regulation Name/ Date	- Sub-Decree No.69, Management of Iodized Salt Exploitation (20-Oct-93) - Joint-PRAKAS On The Management Procedures of All Kind of Iodized Salt Exploitation (2-Jul-04)	Ministry of Health Regulation of the Minister of Industry Number 42/ M-IND/PER/ 11/ 2005 Year 2005 on Processing, Packaging and Labeling of Iodized Salt (29 November 2005)	Prime Minister's Decree on Universal Salt Iodization (1-May-95)	- Food Act 1983 (Act 281) and Regulations 1985 - Guide to Nutrition Labeling and Claims as at December 2007	Prime Minister's Decree on Universal Salt Iodization (1-May-95)	- Republic Act No. 8172, An Act for Salt Iodization Nationwide (20-Dec-95) - BC 2007-009, Updated Standards for Iodine Level of Salts (10-Oct-07) - Bureau Circular 2007-002, Guidelines in the Use of Nutrition and Health Claims in Food (23-Jan-07)	Notification of Ministry of Public Health (MOPH) Re: Iodized Salt (2-Mar-94)	Decree No.19, the Production and Supply of Iodized Salt for Human Consumption (10-Nov-99)

Note: Nutrient function claim is permitted in Thailand with criteria based on Thai RDI and nutrient function claim statement in Thai must conform to the statement that is set in the regulation.

Table 1B. Regulatory status of claims on iodine fortification in SEA

Country	Brunei	Indonesia	Malaysia	Singapore	Thailand
Fortificant	Potassium iodide, Sodium iodide	Iodine	Potassium iodate, Potassium iodide, Sodium iodate, Sodium iodide	Potassium iodate, Potassium iodide, Sodium iodate, Sodium iodide	Iodine
Food Vehicle	Food for human consumption	Food for human consumption	Various types of foods from bread to liquid food[1]	Food for human consumption	Food for human consumption
Minimum Acceptable Level	1/2 RDA (50 mcg) / specified reference quantity	Increase of 10% RDA as compared to the reference food	Ranging from 20 mcg / 100g bread to 500 mcg / 100g extract of meat or vegetable	1/2 RDA (50 mcg) / specified reference quantity	Increase of 10% Thai RDI as compared to the reference food
Maximum Tolerable Level	-	-	200mcg /day	300mcg of iodine/ specified reference quantity	-
Nutrient Content and Comparative Claim Permitted	Yes	Yes	Yes, follow CODEX	Yes	Yes, format similar to Codex, criteria based on Thai RDI
Nutrient Function Claim Permitted	-	Yes	Essential for the formation of thyroid hormone (Conditions: meet the criteria for "source of" claim)	Essential for the synthesis of thyroid hormones by the thyroid gland. (Conditions: meet the criteria for "presence of" claim (1/6 RDA))	*Unofficial translation*: an integral part of the thyroid hormones which regulate growth and development of body and brain functions
Disease Risk Reduction Claim Permitted	-	Not permitted	Not permitted	Not permitted	Not permitted
Regulating body	Department of Health Services, Ministry of Health	National Agency for Drug and Food Control	Food Safety and Quality Division - Ministry of Health Malaysia	Agri-Food & Veterinary Authority of Singapore	Food and Drug Administration
Regulation Name/Date	Public Health (Food) Act (Chapter 182) (1-Feb-01)	- Functional Food 2005 - Reference Value for Nutrition Labeling of Food 2007	- Food Act 1983 (Act 281) and Regulations 1985 Guide to Nutrition Labeling and Claims as at - December 2007	- Sale of Food Act (Chapter 283, Section 38(1)) Food Regulations and Food (Amendment) Regulations 2011 - A Guide to Food Labelling and Advertisements 2010	Notification of the Ministry of Public Health No.182 / 2541(1998), Nutrition Labelling

[1] *Including vegetable juice, fruit juice, fruit juice concentrate, fruit syrup, flavoured syrup (diluted according to directions).*

Note: Nutrient function claim is permitted in Thailand with criteria based on Thai RDI and nutrient function claim statement in Thai must conform to the statement that is set in the regulation.

Table 2A. Iron fortification programs in SEA

Country	Indonesia	The Philippines		Vietnam	
Fortificant	Elemental iron	Ferric ammonium citrate, Ferric phosphate, Ferric pyrophosphate, Ferric sodium pyrophosphate, Ferrous fumarate, Ferrous gluconate, Ferrous lactate, Ferrous sulfate, Elemental iron (electrolytic, II reduced, particle size should be ≤ 50 microns)		Elemental iron	NaFeEDTA
Food Vehicle	Wheat flour	- All rice, except brown rice and locally produced glutinous rice - Wheat flour	Processed foods that contain at least 40 kilocalories per normal serving	Wheat flour	Fish sauce
Status	Mandatory	Mandatory	Voluntary	Voluntary	
Minimum Acceptable Level	50 mg/kg	- 60 mg Fe/kg raw rice; - 70 mg Fe/kg wheat flour	1/3 RDA of target consumer (4 mg for adult; 3.3 mg for child) / number of servings likely to be consumed in a day	60 mg/kg	300 mg/L
Maximum Tolerable Level	-	- 90 mg Fe/kg raw rice; - 105 mg Fe/kg wheat flour	NA	-	500 mg/L
Labeling Requirement	SNI mark	Diamond Sangkap Pinoy Seal for Staples	Sangkap Pinoy Seal for Processed Foods	-	
Nutrient Content and Comparative Claim Permitted	Yes	Yes, follow CODEX, criteria based on Philippines RENI		-	
Nutrient Function Claim Permitted	Yes	Yes, follow CODEX		-	
Disease Risk Reduction Claim Permitted	Not permitted	Yes, follow CODEX		-	
Regulating body	Ministry Of Industry	Department of Health through Food and Drug Administration (FDA) Philippines		Ministry of Health	
Regulation Name/Date	Ministry of Health Regulation of the Minister of Industry Number 42/M-IND/PER/ 11/2005 Year 2005 on Processing, Packaging and Labeling of Iodized Salt (29-Nov-05)	- Republic Act no 8976, Philippine Food Fortification Act of 2000 (7-Nov-00) - Bureau Circular 2007-002, Guidelines in the Use of Nutrition and Health Claims in Food (23-Jan-07)	- Administrative Order No. 4-A s. 1995, Guidelines on Micronutrient Fortification of Processed Foods (14-Feb-95) - Bureau Circular 2007-002, Guidelines in the Use of Nutrition and Health Claims in Food (23-Jan-07)	Decision No 6289/2003/QD-BYT, Technical Regulation on Food Fortification (9-Dec-03)	

Note: Nutrient function claim is permitted in Thailand with criteria based on Thai RDI and nutrient function claim statement in Thai must conform to the statement that is set in the regulation.

Table 2B. Regulatory status of claims on iron fortification in SEA

Country	Brunei	Indonesia	Malaysia	Singapore	Thailand
Fortificant	Electrolytic iron, Ferric phosphate, Ferric pyrophosphate, Ferrous gluconate, Ferrous lactate, Ferrous sulphate,	Elemental iron	Iron-casein complex, Carbonyl iron, Electrolytic iron, Ferric ammonium citrate, Ferric caseinate, Ferric citrate, Ferric gluconate, Ferric phosphate, Ferric pyrophosphate, Ferric saccharate, Ferrous carbonate, Ferrous citrate, Ferrous fumarate, Ferrous gluconate, Ferrous lactate, Ferrous succinate, Ferrous sulphate, Hydrogen reduced iron, Sodium ferric pyrophosphate	Carbonyl iron, Electrolytic iron, Ferric ammonium citrate, Ferric citrate, Ferric gluconate, Ferric phosphate, Ferric pyrophosphate, Ferric saccharate, Ferrous carbonate, Ferrous citrate, Ferrous fumarate, Ferrous gluconate, Ferrous lactate, Ferrous succinate, Ferrous sulphate, Hydrogen reduced iron, Sodium ferric pyrophosphate	Iron
Food Vehicle	Food for human consumption	Food for human consumption	Various types of foods from bread to liquid food[1]	Food for human consumption	Food for human consumption
Minimum Acceptable Level	1/2 RDA (5 mg) / specified reference quantity	Increase of 10% RDA as compared to the reference food	Ranging from 20 mcg / 100 g bread to 500 mcg / 100 g extract of meat or vegetable	1/2 RDA (5 mg) / specified reference quantity	Increase of 10% Thai RDI as compared to the reference food
Maximum Tolerable Level	-	-	200 mcg /day	30 mg of iron / specified reference quantity	-
Nutrient Content and Comparative Claim Permitted	Yes	Yes	Yes, follow CODEX	Yes	Yes, format similar to Codex, criteria based on Thai RDI
Nutrient Function Claim Permitted	-	Yes	Factor in red blood cell formation; component of haemoglobin in red blood cell which carry oxygen to all parts of the body. (Conditions: meet the criteria for "source of" claim)	An important component of red blood cells which carry oxygen to all parts of the body to help the body's production of energy; needed to produce haemoglobin, the protein in red blood cells that carries oxygen to tissues needed to produce myoglobin, the protein that helps supply oxygen to muscle. (Conditions: meet the criteria for "presence of" claim (1/6 RDA))	Yes, criteria based on Thai RDI and nutrient function claim statement must conform to the statement that set in the regulation. *Unofficial translation*: an indispensable component of hemoglobin in red blood cells
Disease Risk Reduction Claim Permitted	-	Not permitted	Not permitted	Not permitted	Not permitted
Regulating body	Department of Health Services, Ministry of Health	National Agency for Drug and Food Control	Food Safety and Quality Division - Ministry of Health Malaysia	Agri-Food & Veterinary Authority of Singapore	Food and Drug Administration
Regulation Name/Date	Public Health (Food) Act (Chapter 182) (1-Feb-01)	- Functional Food 2005 - Reference Value for Nutrition Labeling	- Food Act 1983 (Act 281) and Regulations 1985 - Guide to Nutrition Labeling and Claims as at December 2007	- Sale of Food Act (Chapter 283, Section 38(1)) Food Regulations and Food (Amendment) Regulations 2011 - A Guide to Food Labelling and Advertisements 2010	Notification of the Ministry of Public Health No.182 / 2541(1998), Nutrition Labelling

[1] *Including vegetable juice, fruit juice, fruit juice concentrate, fruit syrup, flavoured syrup (diluted according to directions).*

Table 3A. Vitamin A fortification programs in SEA

Country	The Philippines			Thailand	Vietnam
Fortificant	Retinol acetate, retinol palmitate	Retinol acetate, retinol palmitate	Beta carotene (Provitamin A)	Vitamin A	Vitamin A palmitate
Food Vehicle	- Wheat flour; - Refined sugar - Cooking oil for human consumption except for export	Processed foods that contain at least 40 kilocalories per normal serving		- Condensed milk - Margarine	- Sugar - vegetable oil
Status	Mandatory	Voluntary		Mandatory	Voluntary
Minimum Acceptable Level	- 6.5 mg retinol /kg wheat flour - 1.0 mg/kg refined sugar - 12 mg RE/L cooking oil	1/3 RDA of the target consumer / total number of servings likely to be consumed in a day		- 33.0 mg RE /kg condensed milk - 25 IU/g margarine*	- 15 mg /kg sugar - 50 IU/g vegetable oil (15 mg RE/kg)*
Maximum Tolerable Level	- 30.0 mg retinol /kg wheat flour - 30.0 mg/kg refined sugar - 23 mg RE/L cooking oil	150% of the RDA for the target consumer	NA	-	- 30 mg /kg sugar - 100 IU/g vegetable oil (30 mg RE/kg)*
Labeling Requirement	Diamond Sangkap Pinoy Seal for Staples	Sangkap Pinoy Seal for Processed Foods	-	-	
Nutrient Content and Comparative Claim Permitted	Yes, follow CODEX, criteria based on Philippines RENI			Yes, format similar to Codex, criteria based on Thai RDI	-
Nutrient Function Claim Permitted	Yes, follow CODEX			Yes, criteria based on Thai RDI and nutrient function claim statement must conform to the statement that is set in the regulation. *Unofficial translation*: help promote normal growth and development; help develop vision; support the development and maintenance of epithelial cells in mucus membranes	-
Disease Risk Reduction Claim Permitted	Yes, follow CODEX			Not permitted	-
Regulating body	Department of Health through Food and Drug Administration (FDA) Philippines			Food and Drug Administration	Ministry of Health
Regulation Name/Date	- Republic Act no 8976, Philippine Food Fortification Act of 2000 (7-Nov-00) - Bureau Circular 2007-002, Guidelines in the Use of Nutrition and Health Claims in Food (23-Jan-07)	- Administrative Order No. 4-A s. 1995, Guidelines on Micronutrient Fortification of Processed Foods (14-Feb-95) - Bureau Circular 2007-002, Guidelines in the Use of Nutrition and Health Claims in Food (23-Jan-07)		- Notification of the Ministry of Public Health No. 265 B.E. 2545 (2002) (19-Dec-02) – condensed milk - Notification of the Ministry of Public Health (No. 207) B.E. 2543 (2000) (24-Jan-01) – margarine	Decision No 6289/2003/QD-BYT, Technical Regulation on Food Fortification (9-Dec-03)

** 1 IU = 0.3 mcg Retinol Equivalent*

Table 3B. Regulatory status of claims on vitamin A fortification in SEA

Country	Brunei	Indonesia	Malaysia	Singapore	Thailand
Fortificant	Vitamin A, vitamin A acetate, vitamin A alcohol, vitamin A palmitate, Beta-carotene	Vitamin A, carotenoid	Retinol, Retinyl acetate, Retinyl palmitate, Retinyl propionate, Beta-carotene	Retinol, Retinyl acetate, Retinyl palmitate, Retinyl propionate, Beta-carotene	Vitamin A
Food Vehicle	Food for human consumption	Food for human consumption	Various types of foods from bread to liquid food	Food for human consumption	Food for human consumption
Minimum Acceptable Level	1/2 RDA (375 mcg) / specified reference quantity	Increase of 10% RDA as compared to the reference food	Ranging from 500 IU of Vitamin A / 100 g bread to12,000 IU of Vitamin A / 100 g extract of meat or vegetable*	1/2 RDA (375 mcg) / specified reference quantity	Increase of 10% Thai RDI as compared to the reference food
Maximum Tolerable Level	-	-	5000 IU / day*	750 mcg of retinol activity / specified reference quantity	-
Nutrient Content and Comparative Claim Permitted	Yes	Yes	Yes, follow CODEX	Yes	Yes, format similar to Codex, criteria based on Thai RDI
Nutrient Function Claim Permitted	-	Yes	Aids in maintaining the health of skin and mucous membrane; essential for the functioning of the eyes (Conditions: meet the criteria for "source of" claim)	Essential for the functioning of the eye (Conditions: meet the criteria for "presence of" claim (1/6 RDA))	*Unofficial translation*: Help promote normal growth and development; help develop vision; support the development and maintenance of epithelial cells in mucus membranes
Disease Risk Reduction Claim Permitted	-	Not permitted	Not permitted	Not permitted	Not permitted
Regulating body	Department of Health Services, Ministry of Health	National Agency for Drug and Food Control	Food Safety and Quality Division - Ministry of Health Malaysia	Agri-Food & Veterinary Authority of Singapore	Food and Drug Administration
Regulation Name/Date	Public Health (Food) Act (Chapter 182) (1-Feb-01)	- Functional Food 2005 - Reference Value for Nutrition Labeling of Food 2007	- Food Act 1983 (Act 281) and Regulations 1985 - Guide to Nutrition Labeling and Claims as at December 2007	- Sale of Food Act (Chapter 283, Section 38(1)) Food Regulations and Food (Amendment) Regulations 2011 - A Guide to Food Labelling and Advertisements 2010	Notification of the Ministry of Public Health No.182 / 2541(1998), Nutrition Labelling

** 1 IU = 0.3 mcg Retinol Equivalent*

Note: Nutrient function claim is permitted in Thailand with criteria based on Thai RDI and nutrient function claim statement in Thai must conform to the statement that is set in the regulation.

Table 4A. Folic acid and B vitamins fortification programs in SEA

Country	Indonesia	The Philippines	Thailand	Vietnam
Fortificant	- Folic acid - Vitamin B1: Thiamin - Vitamin B2: Riboflavin	- B1: Thiamin Hydrochloride, Thiamin Mononitrate - B2: Riboflavin, Riboflavin-5-phosphate (sodium salt of) - B3: Niacin or nicotinic acid, Niacinamide or nicotinamide, Niacinamide ascorbate - B6: Pyridoxine Hydrochloride - B7: Biotin - B12: Cyanocobalamin - Other B Vitamins : Folic acid, Pantothenic acid (calcium salt of), panthenol	- B1: Thiamin - B2: Riboflavin - B3: Nicotinic acid, Nicotinamide	- Folic acid - Vitamin B1: Thiamin - Vitamin B2: Riboflavin
Food Vehicle	Wheat flour	Processed foods that contain at least 40 kilocalories per normal serving	Vitaminized rice	Wheat flour
Status	Mandatory	Voluntary	Mandatory	Voluntary
Minimum Acceptable Level	- 2 mg folic acid /kg - 2.5 mg vitamin B1 /kg - 4 mg vitamin B2 /kg	- Vitamin B1, B2, Other B Vitamins : 1/3 RDA of the target consumer - Vitamin B3, B6, B7, B12: 1/5 RDA of the target consumer	- 4 mg vitamin B1 /kg - 3 mg vitamin B2 /kg - 37 mg vitamin B3 /kg	- 2 mg folic acid /kg - 2.5 mg vitamin B1 /kg - 4 mg vitamin B2 /kg
Maximum Tolerable Level	-	NA	-	-
Labeling Requirement	SNI mark	-	-	-
Nutrient Content and Comparative Claim Permitted	Yes	Yes, follow CODEX, criteria based on Philippines RENI	Yes, format similar to Codex, criteria based on Thai RDI	-
Nutrient Function Claim Permitted	No for folic acid Yes for Vitamin B1 and B2	Yes, follow CODEX	Yes, criteria based on Thai RDI and nutrient function claim statement must conform to the statement that set in the regulation. *Unofficial translation*: Vitamin B1: helps in carbohydrate metabolism; partly helps in function of nervous and muscular system Vitamin B2: helps in the metabolism of carbohydrates, proteins and fats Niacin: help maintain the condition of mucous in the digestive system and keep skin healthy; helps in the metabolism of carbohydrates, proteins and fats.	Ministry of Health
Disease Risk Reduction Claim Permitted	Yes for folic acid No for Vitamin B1 and B2	Yes, follow CODEX	Not permitted	
Regulating body	- Ministry Of Industry - Ministry of Health	Department of Health through Food and Drug Administration (FDA) Philippines	Food and Drug Administration	
Regulation Name/Date	- Minister of Industry Decree No. 49/M-IND/PER/7/2008, Mandatory Enforcement of Wheat Flour as Food (14-Jul-08) - Minister of Health Decree No 1452/MENKES/SK/X/2003, Wheat Flour Fortification (7-Oct-03)	- Administrative Order No. 4-A s. 1995, Guidelines on Micronutrient Fortification of Processed Foods (14-Feb-95) - Bureau Circular 2007-002, Guidelines in the Use of Nutrition and Health Claims in Food (23-Jan-07)	Notification of Ministry of Public Health (MOPH) No.150 (1993)	Decision No 6289/2003/QD-BYT, Technical Regulation on Food Fortification (9-Dec-03)

Table 4B. Regulatory status of claims on folate and B vitamins fortification in Malaysia

Nutrient	Vitamin B1	Vitamin B2	Vitamin B3	Vitamin B5	Vitamin B6	Vitamin B7	Vitamin B12	Folate
Fortificant	Thiamine chloride hydrochloride, thiamine hydrochloride, thiamine mononitrate	Riboflavin, riboflavin-5-phosphate, riboflavin-5-phosphate sodium	Niacin, niacinamide, nicotinic acid, nicotinamide	Calcium pantothenate, d-pantothenic acid, d-pantothenyl alcohol, panthenol	Pyridoxal, pyridoxamin, pyridoxine, pyridoxine hydrochloride	d-biotin	Cyanocobalamin, hydroxycobalamin	Folacin, folic acid
Minimum Acceptable Level	Ranging from 0.21 - 5.00 mg / 100 g depending on food type*	Ranging from 0.33 - 8.00 mg / 100 g depending on food type*	Ranging from 2.3 - 55.00 mg / 100 g depending on food type*	Ranging from 1.46 - 35.00 mg / 100 g depending on food type*	Ranging from 0.42 - 10.00 mg / 100 g depending on food type*	Ranging from 40 -1000 mcg/ 100 g depending on food type*	Ranging from 0.3 - 2.4 mcg / 100 g depending on food type*	Ranging from 8 - 64 mcg / 100 g depending on food type*
Maximum Tolerable Level	2.2 mg / day	3.2 mg / day	22 mg / day	14 mg / day	400 mcg / day	400 mcg / day	400 mcg / day	400mcg / day
Nutrient Function Claim Permitted (Conditions: meet the criteria for "source of" claim)	Needed for the release of energy from carbohydrate	Needed for the release of energy from proteins, fats and carbohydrates	Needed for the release of energy from proteins, fats and carbohydrates	-	-	-	Needed for red blood cell production	Folic acid is essential for growth and division of cells; Folate plays a role in a formation of red blood cells and helps to maintain the growth and development of the foetus

* *Claim on fortification is allowed on various types of foods from bread to liquid food.*

Note: Nutrient content and comparative claim are permitted, following Codex. Disease risk reduction claim is not permitted. The claim on B vitamins fortification is regulated by Food Act 1983 (Act 281) and Regulations 1985 & Guide to Nutrition Labeling and Claims as at December 2007 under the Food Safety and Quality Division, Ministry of Health, Malaysia.

Table 4C. Regulatory status of claims on folate and B vitamins fortification in Singapore

Nutrient	Vitamin B1	Vitamin B2	Vitamin B3	Vitamin B6	Vitamin B12	Folate
Fortificant	Thiamin, aneurine, thiamin hydrochloride, thiamin mononitrate	Riboflavin, riboflavin-5-phosphate sodium	Niacin, niacinamide, nicotinic acid, nicotinamide	Pyridoxal, pyridoxamin, pyridoxine, pyridoxine hydrochloride	Cobalamin, cyanocobalamin, hydroxycobalamin	Folic acid
Minimum Acceptable Level	1/2 RDA (0.5 mg) / specified reference quantity	1/2 RDA (0.75 mg) / specified reference quantity	1/2 RDA (8 mg) / specified reference quantity	1/2 RDA (1 mg) / specified reference quantity	1/2 RDA (1 mcg) / specified reference quantity	1/2 RDA (100 mcg) / specified reference quantity
Nutrient Function Claim Permitted (Conditions: meet the criteria for "source of" claim)	Helps to release energy from proteins, fats and carbohydrates.	Helps to release energy from proteins, fats and carbohydrates	Helps to release energy from proteins, fats and carbohydrates	Important for the production of energy	Necessary for fat, carbohydrate and protein metabolism; needed for/helps in the formation of red blood cells	For pregnant women: helps support foetus' growth and overall development; plays a role in the formation of red blood cells; taken before and during early pregnancy, helps in the mental/normal and overall development of foetus; essential/important for growth and division of cells

Note: Claim on fortification is allowed on food for human consumption. Singapore does not set maximum allowable limit. Nutrient content and comparative claim are permitted. Disease risk reduction claim is not permitted. The claim on fortification by Agri-Food & Veterinary Authority of Singapore is as stipulated under the Sale of Food Act (Chapter 283, Section 38(1)) Food Regulations and Food (Amendment) Regulations 2011 and the Guide to Food Labelling and Advertisements 2010

Table 4D. Regulatory status of claims on folate and B vitamins fortification in Brunei, Indonesia, and Thailand

Nutrient	Vitamin B1	Vitamin B2	Vitamin B3	Vitamin B5	Vitamin B6	Vitamin B7	Vitamin B12	Folate
Fortificant	Thiamine, thiamine hydrochloride, thiamine mononitrate	Riboflavin, riboflavin-5-phosphate	Niacin, niacinamide, nicotinic acid, nicotinamide	Calcium pantothenate, sodium pantothenate, d-pantothenic acid, d-pantothenyl alcohol,	Pyridoxal, pyridoxamin, pyridoxine hydrochloride	Biotin	Vitamin B12	Folic acid
Minimum Acceptable Level (Brunei)	1/2 RDA (0.5 mg) / specified reference quantity	1/2 RDA (0.75 mg) / specified reference quantity	1/2 RDA (8 mg) / specified reference quantity	1/2 RDA (3.5 mg) / specified reference quantity	1/2 RDA (1 mg) / specified reference quantity	1/2 RDA (100 mcg) / specified reference quantity	1/2 RDA (1.5 mcg) / specified reference quantity	1/2 RDA (0.2 mg) / specified reference quantity
Minimum Acceptable Level (Indonesia / Thailand)	Increased of 10% RDA or Thai RDI as compared to the reference food							
Nutrient Function Claim Permitted (Indonesia)	Yes	Yes	Yes	No	Yes	No	Yes	No
Nutrient Function Claim Permitted (Thailand) – Unofficial translation	Helps in carbohydrate metabolism; partly helps in function of nervous and muscular system	Helps in the metabolism of carbohydrates, proteins and fats	Help maintain the condition of mucous in the digestive system and keep skin healthy; helps in the metabolism of carbohydrates, proteins and fats	Help in utilizing (metabolism of) fat and carbohydrate; help in utilizing fat and carbohydrate; help in metabolism of fat and carbohydrate	Promotes red blood cells formation; helps in producing necessary metabolite for maintaining the normal nerve function	Important component in utilizing (metabolism of) fat and carbohydrate; Important component in utilizing fat and carbohydrate; Important component in metabolism of fat and carbohydrate	Help in synthesis of essential substances for formation of red blood cells; help promote function of the nervous and brain system.	Necessary for the formation of red blood cells; necessary for regulating embryonic neural tube and nerve cell formation in early pregnancy.

Note: Claim on fortification in Brunei, Indonesia, and Thailand is allowed on food for human consumption. Brunei, Indonesia, and Thailand do not set maximum allowable limit. Nutrient function claim and disease reduction claim are not permitted in Brunei. Nutrient content and comparative claims are permitted in Indonesia for all the above micronutrients except vitamin B7. Except for folic acid, disease reduction claim is not permitted in Indonesia. Nutrient content, comparative, and function claims are permitted in Thailand for all the above micronutrients, with criteria based on Thai RDI; nutrient function claim statement must comform to the statement that is set in the regulation. Disease risk reduction claim is not permitted in Thailand.

Provision on fortification claim in Brunei is made in Public Health (Food) Act (Chapter 182) under Department of Health Services, Ministry of Health. Provision on fortification claim in Indonesia is made in Functional Food 2005with RDA stated in Reference Value for Nutrition Labeling of Food 2007 under National Agency for Drug and Food Control. Provision on fortification claim in Thailand is made in Notification of the Ministry of Public Health No.182 / 2541(1998), Nutrition Labelling under Food and Drug Administration.

Table 5. Zinc fortification programs and regulatory status of claims on zinc fortification in SEA region

Country	Indonesia		The Philippines	Vietnam	Thailand
Fortificant	Zinc		Zinc chloride, Zinc gluconate, Zinc oxide, Zinc stearate, Zinc sulfate	Zinc	Zinc
Food Vehicle	Wheat flour	Food for human consumption	Processed foods that contain at least 40 kilocalories per normal serving	Wheat Flour	Food for human consumption
Status	Mandatory	For fortification claim	Voluntary	Voluntary	For fortification claim
Minimum Acceptable Level	30 mg/kg	Increase of 10% RDA as compared to the reference food	1/5 RDA of the target consumer	30 mg/kg	Increase of 10% Thai RDI as compared to the reference food
Maximum Tolerable Level	-	-	150% of the RDA for the target consumer	-	-
Labeling Requirement	SNI mark	-	-	-	-
Nutrient Content and Comparative Claim Permitted	Yes	Yes	Yes, follow CODEX, criteria based on Philippines RENI	-	Yes
Nutrient Function Claim Permitted	No	No	Yes, follow CODEX	-	*Unofficial translation*: promote normal growth
Disease Risk Reduction Claim Permitted	No	No	Yes, follow CODEX	-	No
Regulating body	- Ministry of Industry - Ministry of Health	National Agency for Drug and Food Control	Department of Health through Food and Drug Administration (FDA) Philippines	Ministry of Health	Food and Drug Administration
Regulation Name/Date	- Ministry of Industry Decree No. 49/M-IND/PER/7/2008, Mandatory Enforcement of Wheat Flour as Food (14-Jul-08) - Ministry of Health Decree No 1452/ MENKES/SK/X/ 2003, Wheat Flour Fortification (7-Oct-03) - Functional Food 2005	- Food Labeling Guide 2004 - Reference Value for Nutrition Labeling of Food 2007	- Administrative Order No. 4-A s. 1995, Guidelines on Micronutrient Fortification of Processed Foods (14-Feb-95) - Bureau Circular 2007-002, Guidelines in the Use of Nutrition and Health Claims in Food (23-Jan-07)	Decision No 6289/2003/QD-BYT, Technical Regulation on Food Fortification (9-Dec-03)	Notification of the Ministry of Public Health No.182 / 2541(1998), Nutrition Labelling

Note: Nutrient function claim is permitted in Thailand with criteria based on Thai RDI and nutrient function claim statement in Thai must conform to the statement that is set in the regulation

Table 6A. Voluntary fortification programs with other vitamins and minerals in the Philippines

Nutrient	Vitamin C	Vitamin D	Vitamin E	Vitamin K	Calcium	Copper	Magnesium	Manganese	Selenium
Fortificant	Ascorbic acid (calcium/ sodium salt of)	- Vitamin D2: Ergocalciferol - Vitamin D3: Chole calciferol	DL-alpha-tocopherol, D-alpha-tocopherol, DL-alpha-tocopheryl acetate, D-alpha-tocopheryl acetate, Tocopherols, mixed concentrate	Phytonadione	Calcium (non-calcinated or calcinated), Calcium carbonate, Calcium chloride, Calcium citrate, Calcium lactate, Calcium oxide, Calcium phosphate (mono, di-, and tri-basic, glycero-, pyro-)	Copper Gluconate, Copper Sulfate	Magnesium carbonate, Magnesium chloride, Magnesium lactate, Magnesium oxide, Magnesium phosphate (di- and tribasic), Magnesium sulfate	Manganese chloride, Manganese citrate, Manganese gluconate, Manganese glycerophosphate, Manganese sulfate	Sodium selenate
Minimum Acceptable Level	1/3 RDA of the target consumer, except for fortified juices/flavored drinks to provide at least 100% RDA	1/5 RDA of the target consumer	1/5 RDA of the target consumer	1/5 RDA of the target consumer	1/3 RDA of the target consumer	1/5 safe and adequate daily intake	1/5 RDA of the target consumer	1/5 safe and adequate daily intake	1/5 RDA of the target consumer
Maximum Tolerable Level	NA	150% of the RDA for the target consumer	150% of the RDA for the target consumer	150% of the RDA for the target consumer	NA	NA	NA	NA	150% of the RDA for the target consumer

Note: Voluntary fortification program applies to processed foods that contain at least 40 kilocalories per normal serving. Nutrient content and comparative claim are permitted, following Codex with criteria based on Philippines RENI; Nutrition function claim and disease risk reduction claim is permitted, following Codex; The fortification is regulated by Administrative Order No. 4-A s. 1995 "Guidelines on Micronutrient Fortification of Processed Foods" & Bureau Circular 2007-002 "Guidelines in the Use of Nutrition and Health Claims in Food" under Department of Health through Food and Drug Administration (FDA) Philippines.

Table 6B. Regulatory status of claims on other vitamins and minerals fortification in Brunei Darussalam

Nutrient	Vitamin C	Vitamin D	Vitamin E	Calcium	Phosphorus
Fortificant	Ascorbic acid, Ascorbyl palmitate, Sodium ascorbate	vitamin D2, D3	Tocopherols, alpha-tocopherol acetate	Calcium carbonate, Calcium citrate, Calcium glycerophosphate, Calcium oxide, Calcium phosphate mono-, di, tri-basic, Calcium pyrophosphate, Calcium sulphate	Calcium phosphate (mono-, di-, tri-basic), Sodium phosphate (mono-, tri-basic)
Minimum acceptable level (per specified reference quantity)	1/2 RDA (15 mg)	1/2 RDA (1.25 mcg cholecalciferol)	1/2 RDA (1.75 mg α-tocopherol)	1/2 RDA (250 mg)	1/2 RDA (400 mg)

Table 6C. Regulatory status of claims on other vitamins and minerals fortification in Indonesia

Nutrient	Vitamin C	Vitamin D	Vitamin E	Potassium	Calcium	Magnesium	Manganese	Selenium
Nutrient Content and Comparative Claim Permitted	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nutrient Function Claim Permitted	Yes	No	Yes	No	Yes	No	No	No
Disease Risk Reduction Claim Permitted	No	No	No	Yes	Yes	No	No	No

Note: Claim on fortification in Indonesia is allowed on food for human consumption. Minimum acceptable limit of fortification to qualify for fortification claim is an increase of 10% RDA as compared to the reference food. No maximum allowable limit is set. Provision on fortification claim in Indonesia is made in Functional Food 2005 with RDA stated in Reference Value for Nutrition Labeling of Food 2007 under National Agency for Drug and Food Control.

Table 6D. Regulatory status of claims on other vitamins and minerals fortification in Malaysia

Nutrient	Vitamin C	Vitamin D	Vitamin E	Calcium	Phosphorus
Fortificant	Ascorbic acid, Sodium ascorbate, Calcium ascorbate, Sodium ascorbate, Ascorbyl-6-palmitate	Cholecalciferol-cholesterol, Vitamin D2, Vitamin D3	D-alpha-tocopherol, DL-alpha-tocopherol, D-alpha-tocopherol acetate, DL-alpha-tocopherol acetate, D-alpha-tocopheryl succinate, DL-alpha-tocopheryl succinate, tocopherol	Calcium carbonate, Calcium chloride, Calcium citrate, Calcium gluconate, Calcium glycerophosphate, Calcium lactate, Calcium oxide, Calcium phosphate mono-, di, tri-basic, Calcium pyrophosphate, Calcium sulphate	Calcium phosphate (mono-, di-, tri-basic), Magnesium phosphate (di-, tri-basic), Potassium phosphate (mono-, di-basic), Sodium phosphate di-basic
Minimum Acceptable Level	Ranging from 6 - 150 mg of ascorbic acid / 100 g depending on food type*	Ranging from 83 - 2000 IU of vitamin D / 100 g depending on food type*†	Ranging from 4.2 - 100.00 IU of Vitamin E / 100 g depending on food type*††	Ranging from 150 - 1170 mg / 100 g depending on food type*	Ranging from 150 - 1170 mg / 100 g depending on food type*
Maximum Tolerable Level	100 mg / day	800 IU / day†	50 IU / day††	1.4g / day	1.4g / day
Nutrient Function Claim Permitted	Enhances absorption of iron from non-meat sources; contributes to the absorption of iron from food	Helps the body utilize calcium & phosphorus; necessary for the absorption and utilization of calcium & phosphorus	Protects the fat in the body tissues from oxidation	Aids in the development of strong bones and teeth	-

** Claim on fortification in Malaysia is permitted on various types of foods from bread to liquid food.*

† 1 IU = 0.025 mcg vitamin D2 / vitamin D3

†† 1 IU = 1 mcg dl-alpha-tocopheryl acetate

Note: Nutrient content and comparative claim are permitted, following Codex; Disease risk reduction claim is not permitted. Provision on fortification claim is made in Food Act 1983 (Act 281) and Regulations 1985 & Guide to Nutrition Labeling and Claims as at December 2007 under Food Safety and Quality Division - Ministry of Health Malaysia.

Table 6E. Regulatory status of claims on other vitamins and minerals fortification in Singapore

Nutrient	Vitamin C	Vitamin D	Calcium	Phosphorus
Fortificant	Ascorbic acid, Sodium ascorbate, Calcium ascorbate, Potassium ascorbate, Ascorbyl-6-palmitate	Ergocalciferol (Vitamin D2), Cholecalciferol (Vitamin D3), Cholecalciferol-cholesterol (Vitamin D3)	Calcium carbonate, Calcium chloride, Calcium citrate, Calcium gluconate, Calcium glycerophosphate, Calcium hydroxide, Calcium lactate, Calcium oxide, Calcium phosphate mono-, di, tri-basic, Calcium pyrophosphate, Calcium sulphate	Calcium phosphate (mono-, di-, tri-basic), Magnesium phosphate (di-, tri-basic), Potassium phosphate (mono-, di-basic), Sodium phosphate di-basic, Phosphoric acid
Minimum Acceptable Level	1/2 RDA (15 mg)	1/2 RDA (1.25 mcg cholecalciferol)	1/2 RDA (250 mg, to be revised to 400 mg)	1/2 RDA (400 mg)
Maximum Tolerable Level	-	10 mcg of cholecalciferol / specified reference quantity	2400 mg of calcium / specified reference quantity	2400 mg of phosphorus / specified reference quantity
Nutrient Function Claim Permitted (Conditions: meet the criteria for "presence of" claim (1/6 RDA))	Enhances absorption of iron from non meat products	Vitamin D3: helps support calcium absorption and improves bone strength; helps the body utilize calcium and phosphorus; works synergistically with vitamin K on bone metabolism to improve bone strength/build strong bones	Helps build/to support development of strong bones and teeth	-

Note: Claim on fortification is allowed on food for human consumption. Minimum acceptable level is as per specified reference quantity. Nutrient content and comparative claims are permitted. Disease risk reduction claim is not permitted. Provision on fortification claim is made by Agri-Food & Veterinary Authority of Singapore as stipulated under the Sale of Food Act (Chapter 283, Section 38(1)) Food Regulations and Food (Amendment) Regulations 2011 and the Guide to Food Labelling and Advertisements 2010.

Table 6F. List of other vitamins and minerals permitted for fortification claims in Thailand *(Unofficial Translation)*

Nutrient	Nutrient Function Claim Permitted (criteria based on Thai RDI; nutrient function claim statement in Thai must conform to the statement that is set in the regulation)
Vitamin C	Strengthen capillary walls; help in inhibiting free radical generation; assist in the formation of muscle, collagen and connective tissue of ligaments and cartilages
Vitamin D	Required for the absorption and utilization of calcium and phosphorus
Vitamin E	Help in inhibiting free radical generation
Vitamin K	Involved in creating the important substances in blood clotting process; decrease the incidence or severity of osteoporosis, calcium re-absorption and help strengthen bones
Calcium	Essential component in bones and teeth; helps in blood clotting process; essential for building healthy bones and teeth
Phosphorus	Essential component in bones and teeth; essential for building healthy bones and teeth
Magnesium	Important structural part of bones and teeth; helps in the maintenance the function of nervous system and muscles
Copper	Assist the formation of hemoglobin
Potassium	Work together with sodium in maintaining the proper acid-base and water balance in the body system Warning: Excessive potassium can be toxic and will affect the heartbeat
Manganese	Component of bone and teeth; help promote function of nervous and muscle system
Selenium	Helps in inhibiting free radical generation
Fluoride	Helps promote formation of healthy bones and teeth
Molybdenum	Helps promote enzyme function in the body
Chromium	Works together with Insulin for cellular glucose uptake
Chloride	Works with other substance in maintaining the optimum acid-base balance in the body

Note: Claim on fortification in Thailand is allowed on food for human consumption. Minimum acceptable limit of fortification to qualify for fortification claim is an increase of 10% Thai RDA as compared to the reference food. No maximum allowable limit is set. Nutrient content, comparative, and function claims are permitted in Thailand for all the above micronutrients, with criteria based on Thai RDI; nutrient function claim statement must comform to the statement that is set in the regulation. Disease risk reduction claim is not permitted in Thailand. Provision on fortification claim in Thailand is made in Notification of the Ministry of Public Health No.182 / 2541(1998), Nutrition Labelling under Food and Drug Administration.

Table 7A. Monitoring and Evaluation of Mandatory Fortification Programs in Cambodia, Indonesia and Malaysia

Country	Cambodia	Indonesia	Malaysia
Monitoring agency	Ministry of Commerce through CamControl in collaboration with relevant ministry	National Agency for Drug and Food Control	Food Safety and Quality Division – Enforcement Section
Outline of system	**Salt iodization** • The technical competent officials that are responsible for controlling the salt quality and safety shall be a quality control official from the Ministry of Commerce in collaboration with other relevant ministries. • The places where the inspection shall be done are salt factories, enterprise, handicraft, salt warehouse, salt wholesale and retail shops, and anywhere that deal with salt distribution. • Owner of factory, enterprise, handicraft and salt traders shall present to the technical competent official any relevant license/ documents with clearly indicate the type and quantity of salt such as importation, being used for any production, sell in markets and in stock.	**Iodized salt monitoring** In distribution/market • Samples: 8 samples/brand/variety/district/phase • Taking samples in the district randomly in the sub-district, vil age and seller/market Wheat flour monitoring • Sampling procedure adopted ISO 8243:1991 • Sampling point: Storage/harbor/importer/importer's storage/ producer, hypermarket, supermarket, shop, small shop/market. In the district, samples are randomly taken in the sub-district, village and seller/market	For mandatory and voluntary fortification: Food Safety Information System (FoSIM)
Noncompliance with fortification process	(a) If salt producers and dealers do not follow the quality and safety standards stated (b) If salt producers and dealers do not follow the packaging, labeling, storage, transport or market/shop display requirement	(a) Producer or importer does not implement SNI and possess certification (b) Producer or importer does not paste SNI mark on food packaging	Value less than 100% of the declared nutrient value on the label
Administrative sanction	Penalty of salt confiscation to 1,000,000KR if they are found of violation the sub-decree. The penalty is doubled after the second violation and their licenses are suspended after third violation.	(a) Written warning until 3 times (b) Revocation of approval registration number	No
Review of regulation	-	-	No

Table 7B. Monitoring and Evaluation of Mandatory and Voluntary Fortification Programs in the Philippines

	Mandatory Fortification	Voluntary Fortification
Monitoring agency	Department of Health through Food and Drug Administration (FDA) Philippines	Department of Health through Food and Drug Administration (FDA) Philippines
Outline of system	The local government units, through their health inspectors or agricultural officers or nutritionist-dietitians or the sanitary inspectors shall assist in monitoring/ checking that foods mandated to be fortified like rice, refined sugar, wheat flour, and cooking oil are properly fortified and labeled with "nutrition facts" indicating the specific micronutrient it was fortified with. The local food industries shall report on the production, marketing and distribution of fortified foods. They shall submit annual reports to the Department of Health (DOH), also indicating their industrial concerns and recommendations.	The FDA itself or FDA in coordination with the recognized agencies or institutions shall monitor the micronutrient of fortified processed food.
Noncompliance with fortification process	(a) If the food fortification levels do not comply with the DOH requirements, except when the deviation from the fortification levels are justified and are properly declared in the labeling; (b) If the fortificant used is different from that approved by the DOH; and (c) If the process of fortification does not conform to the DOH standards.	A processed food claiming fortification shall be considered mislabelled unless the fortification levels comply with these guidelines except when the deviation from the fortification levels herein set are just and are properly declared in the labelling.
Administrative sanction	(a) Denial of registration of the processed foods and food products by the DOH through the FDA if the processed foods or food products do not comply with the food fortification requirements. Said processed foods or food products shall not be allowed to be put in the market; (b) Order the recall of the processed foods or food product(s); and (c) Impose a fine of not less than three hundred thousand pesos (P300,000.00) and suspension of registration for the first violation; not more than six hundred thousand pesos (P600,000.00) and suspension of registration for the second violation; and not more than one million pesos (P1,000,000.00) and cancellation of the registration of the product for the third violation of the provisions of this act or its Implementing Rules and Regulations (IRR).	(a) Order the recall of the products declared/found as mislabelled fortified food (b) Order the correction of the labeling of the fortified food products (c) Impose administrative fines provided for by existing laws (d) Suspend or cancel the registration of the product
Review of regulation	The National Nutrition Council (NNC) shall conduct a periodic review of the micronutrients added to food. This review will provide the basis for determining if the mandatory fortification is still required or not. The review shall be done at least every five (5) years to coincide with the conduct of the Food and Nutrition Research Institute's (FNRI) national nutrition surveys and/or the assessment of the Philippine Plan of Action for Nutrition (PPAN).	

Table S1. Minimum Amounts of Nutrients for Fortification Claims in Malaysia

Nutrient	Bread*	Breakfast cereal (as purchased)*	Condensed milk*†	Dried milk powder (full cream or skimmed)*	Extract of meat or vegetable (modified or not)*	Flour (wheat)*	Malted milk powder*	Other solid food*§	Liquid food*¶
Vit A, vit A alcohol and esters, carotenes (I.U.)**	500	2000	670	2000	12,000	1000	4000	1000	1000
Vit B1, thiamine, thiamine hydro chloride, thiamine mono nitrate (mg thiamine)	0.21	0.83	0.82	0.83	5	0.42	1.67	0.42	0.25
Vit B2, riboflavin (mg riboflavin)	0.33	1.33	0.44	1.33	8	0.67	2.67	0.67	0.4
Vit B6, pyridoxine, pyridoxal, pyridox amine (mg pyridox amine)	0.42	1.67	0.56	1.67	10	0.83	3.33	0.83	0.5
Biotin (mcg biotin)	40	165	55	165	1000	85	335	85	50
Panto thenic acid, panto thenyl alcohol (mg panto thenic acid)	1.46	5.83	1.94	5.83	35	2.92	11.67	2.92	1.75
Niacin, niacin amide, nicotinic acid, nicotin amide (mg niacin)	2.3	9.2	3.1	9.2	55	4.6	18.3	4.6	2.8
Vit C, ascorbic acid (mg ascorbic acid)	6	25	8	25	150	13	50	13	8
Vit D, vit D2, vit D3 (I.U. of vit D)**	83	333	111	333	2000	167	667	167	100
Vit E, alpha toco pherol (I.U. of vit E)**	4.2	16.7	5.6	16.7	100	8.3	33.3	8.3	5
Calcium (mg)	150	580	190	580	3500	290	1170	290	180
Iodine (mcg)	20	85	30	85	500	40	165	40	25
Phosphorus (mg)	2.1	0.3	2.8	4.3	50	4.2	16.7	4.2	2.5
Folic acid (mcg)	150	580	190	580	3500	290	1170	290	180
Vit B12 (mcg)	8	32	11	32	192	16	64	16	9.6

Based on Regulation 26 (7) under Food Act 1983 (Act 281) and Regulations.

* *Reference quantity: 100 grams.*

† *Sweetened and unsweetened; filled milk and condensed filled milk sweetened and unsweetened.*

§ *Not specified above excluding canned food for infants and children and cereal based food for infants and children.*

¶ *Including vegetable juice, fruit juice, fruit juice concentrate, fruit syrup, flavoured syrup (diluted according to directions).*

** *May be expressed in milligrams or micrograms using the following conversion factor: 1 IU vitamin A is equivalent to 0.3 micrograms vitamin A alcohol (retinol); 1 IU vitamin D is equivalent to 0.025 micrograms vitamin D2/vitamin D3; 1 IU vitamin E is equivalent to 1 milligram dl-alpha-tocopheryl acetate.*

http://www.ilsi.org/SEA_Region

REGIONAL OFFICE:
ILSI SOUTHEAST ASIA REGION
9 Mohamed Sultan Road #02-01, Singapore 238959
Tel: 65 6352 5220 Fax: 65 6352 5536 Email: ilsisea@singnet.com.sg

COUNTRY OFFICE & COMMITTEES:
Australasia • Indonesia • Malaysia • Philippines • Thailand