ILSI Symposium on Plant Polyphenols:
Nutrition, Health and Innovations
22-23 June 2009, Kuala Lumpur

Plant polyphenols: regulatory development & consumer education

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Outline of presentation ….

- Examples of consumer education efforts on bioactives
- Are health claims on polyphenols legally permitted in the region? Are there opportunities for making such claims?
- Overview of current status and developments of health claims in
  - Codex Alimentarius
  - several SEA countries (Malaysia, Indonesia, Philippines, Singapore, Thailand)
  - China and Japan
  - focus on health claims of nutrients and bioactives (biologically active components)
- Concluding remarks: regulatory framework

- The number and diversity of presentations on plant polyphenols in this Conference is a clear indication of the amount of scientific interest and activities on this subject
- large volume of literature now exists, documenting studies into the physiological role and health benefits of polyphenols in various plant foods
- Many of these studies are focused on the potential role of these bioactive ingredients in reducing the risk to chronic diseases such as CVD, diabetes mellitus, and some types of cancers

- Health benefits of these bioactive components found in many plant foods must be made known to the consumer
- Hence the food industry has used various ways of promoting these foods or their ingredients to the consumer
- With the continued increase of diet-related chronic diseases, the consumer is certainly attracted to the promise that these potent antioxidants may be beneficial in warding off these ills.

Consumer education/promotion efforts ….

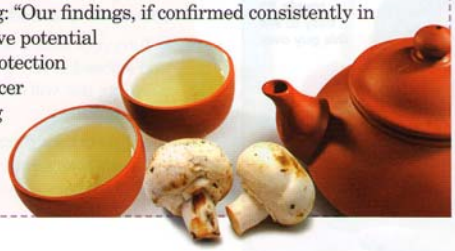
- variety of approaches to provide consumers with insight into health benefits of foods or specific components
- In magazines, newspapers, radio/TV, websites
  - Using write-ups or advertorials without mention of specific brands of product
  - Advertisements of specific brands of products
- Examples from local magazines given in next few slides

- Advertorials providing general write-ups of health benefits, no specific brand advertised or promoted
- Some articles cite scientific publications

eat mushrooms, drink green tea for a

lower breast cancer risk

Australian researchers have found that Chinese women who ate mushrooms and drank green tea regularly significantly reduced their risk for breast cancer, and the severity of the disease in those who did develop it. In a study published in the *International Journal of Cancer*, researchers from the University of Western Australia reported that **the rate of cancer in China was four two five times lower than that of developed countries, and that eating as little of 10g, or less than one button mushroom daily would have this beneficial effect.** "We concluded that a higher dietary intake of mushrooms decreased breast cancer risk in pre- and post-menopausal Chinese women, and an additional decreased risk of breast cancer from the joint effect of mushrooms and green tea was observed," said researcher Min Zhang, adding: "Our findings, if confirmed consistently in other research, have potential implications for protection against breast cancer development using an inexpensive dietary intervention."



body mind soul health

GREAT BEAN FOR WOMEN

女性调养"魔豆"

黄豆富含蛋白质、卵磷脂、胆碱及多种维生素，其蛋白质中含有米面蛋白最为缺乏的离氨酸，因此和米面共食，会有氨基酸的互补效果，使它成为优质蛋白质，足以媲美肉类，所以被称为"田中之肉"！

效用：

·改善女性疾病
黄豆富含多种营养素，最特别的是含高量异黄酮素，能预防和改善乳癌、摄护腺癌等，还可改善妇女更年期症状、骨质疏松症等。

·预防心血管疾病
黄豆中有亚麻油酸成份，能减少动脉壁上的胆固醇累积，具有预防高血压、防治冠心病等功用。

·防癌
黄豆中含有"硒"，能有效防止致癌物质以及正常细胞内的脱氧核糖核酸变异，所以对预防癌症有良好的作用。

·增强记忆力
黄豆中含丰富的大豆卵磷脂，卵磷脂是大脑细胞的组成成份，对于增进和改善大脑机能有作用。

·美容养颜
黄豆中的必需脂肪酸含量很高，对女性的美容极为有效，能改善皮肤粗糙、头发枯黄等，帮助恢复光泽与弹性。

Nutrition for People on the Go

COFFEE, ANYONE?

Many busy executives need a cup of Java to pep up their day. But just how good is coffee? Let's find out.

More and more studies point to the advantages of drinking coffee regularly. Angelina R. Bustos, an assistant professor at the Institute of Human Nutrition and Food at U.P. Los Baños in the Philippines, looks at the benefits of this beverage.

1. IT LOWERS THE RISK FOR SEVERAL DISEASES.

- **Diabetes.** Compared with non-coffee drinkers, people who drink six cups or more of caffeinated coffee daily have a diabetes risk that is lower by 54% for men and 30% for women, according to findings by Harvard researchers. Although the scientists cite the need for further research, their findings do not deviate much from those of less-publicized studies. Aside from caffeine, coffee is loaded with antioxidants and minerals that improve insulin sensitivity and glucose metabolism.
- **Parkinson's disease.** At least six studies have found that regular coffee drinkers are up to 80% less likely to acquire Parkinson's, with three studies indicating that the more coffee is drunk, the lower the risk.
- **Colon cancer, heart disease and liver cirrhosis.** At least two cups of coffee per day can lower the risk of colon cancer by 25% and liver cirrhosis by 80%. Coffee has antioxidants that protect cells against free radicals, which are implicated in cancer, heart disease and degenerative brain disorders.
- **Gallstones.** Coffee's ability to increase bile flow and reduce biliary cholesterol from crystallising helps limit the formation of gallstones.

2. IT HELPS TREAT VARIOUS AILMENTS.

- **Headaches.** Do you know that pain relievers contain up to 120 mg of caffeine in a single dose? That's roughly the same amount found in a mug of coffee! "Caffeine is added to pain medications because it improves absorption in increasing pain-killing effects," explains Bustos.
- **Asthma.** When an attack comes on, have a strong cup of coffee. Caffeine is chemically related to theophylline, a standard asthma medication that helps open airways. According to Bustos, drinking at least three cups a day may also reduce asthma attacks.
- **Constipation.** Caffeine has a bowel-loosening effect that stimulates the colon and induces bowel movement.
- **Hang-over.** Shorten the agony by drinking a cup or two of coffee. Caffeine is a vaso-constrictor that narrows the swollen blood vessels in the head. Just don't drink too much or you risk becoming more dehydrated because coffee, like alcohol, is a diuretic.

3. IT ENHANCES ATHLETIC ENDURANCE AND PERFORMANCE.

Studies show that caffeine boosts strength and endurance. By consuming enough caffeine, you will likely be faster, stronger and able to go on physical activity.

WORDS OF CAUTION

Despite its health benefits, coffee isn't for everyone. With some individuals, excessive coffee may not be tolerated well, increase cholesterol levels and aid in artery clogging. And don't forget – coffee stains teeth.

And while recent studies show no considerable adverse effects on most healthy people, those with heart problems, are at risk for osteoporosis and are pregnant should regulate their coffee intake or avoid it altogether.

Until the issues surrounding coffee are resolved, the American Heart Association recommends moderation in consumption: so, stick to 1-2 cups a day. **HT**

Nuts About Nuts!

BY MONICA C. ADINA

It may sound a little nutty, but there's a growing belief that munching on nuts could actually be good for your heart. The irony is that nuts are high in fat and calories and are therefore thought to be bad for health. However, in moderation, nuts do actually lower the risk of heart disease. All nuts contain unsaturated fatty acids and other nutrients such as protein and fibre, which are particularly beneficial to vegetarians. It is thought that the unsaturated (monounsaturated and polyunsaturated) fats in nuts lower bad cholesterol levels. Many nuts are rich in omega-3 fatty acids, which help the heart by preventing dangerous heart rhythms that can lead to heart attacks. Nuts also have lots of arginine, which is a molecule that increases the production of nitric oxide in your body, which may help improve the health of your artery walls and make them more flexible and less prone to blood clots. Take your pick from the numerous collection of nuts!

Walnuts

Let's face it - with its hard outer shell and brain content resembling a brain, this nut is not the prettiest of the lot, but it is soft to bite and divine to swallow. These are grown intensively in South-West France, Northern Italy and California. Due to its high fat (Omega-3 and monounsaturated) content, the walnut is considered to be "good fat" and lowers cholesterol levels, which in turn lowers the risk of heart disease. The walnut ranks as one of the most widely consumed nuts in the world and is absolutely delectable when used in cakes, breads, salads or cereals. It can also be eaten on its own!

Pecans

When I think pecans, I think of the rich, buttery taste of Famous Amos cookies. Apart from cookies, they are also used in ice cream, bread, cakes and pies. The pecan nut is native to North America and is particularly well-known in the Southern U.S in desserts such as the pecan pie and praline candy. Along with proteins and unsaturated fats, the anti-oxidants, plant sterols, ellagic acid and Vitamin E found in these nuts reduce the cholesterol, heart disease and cancer. They also lower the risk of gallstones in women.

Cashew Nuts

When thinking of cashew nuts, the famous *biryani, pilaf* or *korma* may spring to mind, as cashews are widely used in Indian cuisine from rice to desserts. The cashew is also a popular snack, and its rich flavor means that it is often eaten on its own, lightly salted. Cashew trees are found in Africa, Asia and India and produce apples where a smooth, tan-colored, kidney-shaped cashew nut grows from. The raw cashew has little flavor but roasting brings out its rich, sweet, nutty, buttery flavor. High in fat, they can be ground to an oily paste and combined with poultry or stir-fried vegetables. *Anacardic acid* found in this nut have been used effectively against tooth abscesses. Oil from the cashew nuts is known as antifungal and also for healing cracked heels.

Peanuts

Not to be confused with the comic strip of the same name, these are also known as groundnuts or monkey nuts. Synonymous with sporting events, parades, beach parties, cinemas, cocktail snacks and of course peanut butter sandwiches, these are probably the most universally popular snack (think "Thumbs Up" brand). Peanuts are cultivated in many hot regions such as North America, West Africa, India, China, Malaysia and Indonesia. Peanuts can be sprinkled onto tossed salads, or sautéed with chicken and vegetables. Instead of a peanut butter and jelly sandwich, try peanut butter and banana, peanut butter and honey, or peanut butter and chopped apple, pear and/or raisins. Peanuts contain a high amount of oxlates and individuals who have untreated kidney or gallbladder problems may want to avoid eating them, as the oxlates may interfere with calcium absorption from the body. Similarly, those with allergy reactions to certain foods should also proceed with caution. For the rest of us, we will benefit from peanuts as much as possible.

Pistachios

You probably knew that pistachios were widely used in ice cream. The pistachio is used as a green food colouring and thickening agent and also a stuffing and in many desserts. Native to the Middle East, it is considered one of the oldest flowering nut trees and is a popular snack in the Balkans and Middle Eastern countries. The pistachio has been used as a dyeing agent and a folk remedy for ailments ranging from toothaches to sclerosis of the liver. The nut contain thiamin, vitamin B6, copper, magnesium, potassium and fibre. Nutrients which aid in maintaining blood sugar levels, blood flow, immune function and metabolism and weight management.

Almonds

Almonds can usually be found in milk or dark chocolate, nougat, marzipan, macaroons, Indian curries and Chinese desserts. Like other nuts, they can also be roasted, salted and eaten as a snack. Sugared almonds are also served at Italian, Greek and Middle Eastern weddings. Almond trees are widely cultivated in all Mediterranean countries as well as California, South Africa and parts of Chile, Argentina and Australia. Almond oil, made from edible nut kernels used for massages and moisturizers and acts as a natural skin-softening agent. Those who are lactose intolerant, fret not. Almond milk is a soy-free choice and is also suitable for vegans. Bitter almonds are used to make almond extract and almond-flavored liqueurs. Almonds are:

- Said to improve skin complexion and texture, as well as firmness and elasticity especially in oil or paste form.
- Used as a massage oil and medicine for consumption in *Ayurveda* (ancient Indian health care). It is said to boost the immune system and have anti-inflammatory properties.
- Good for those who are underweight.
- High in vitamin E which helps improve skin condition and prevents accumulation of plaque in the arteries.
- Reduces the risk of heart disease.

Water Chestnuts

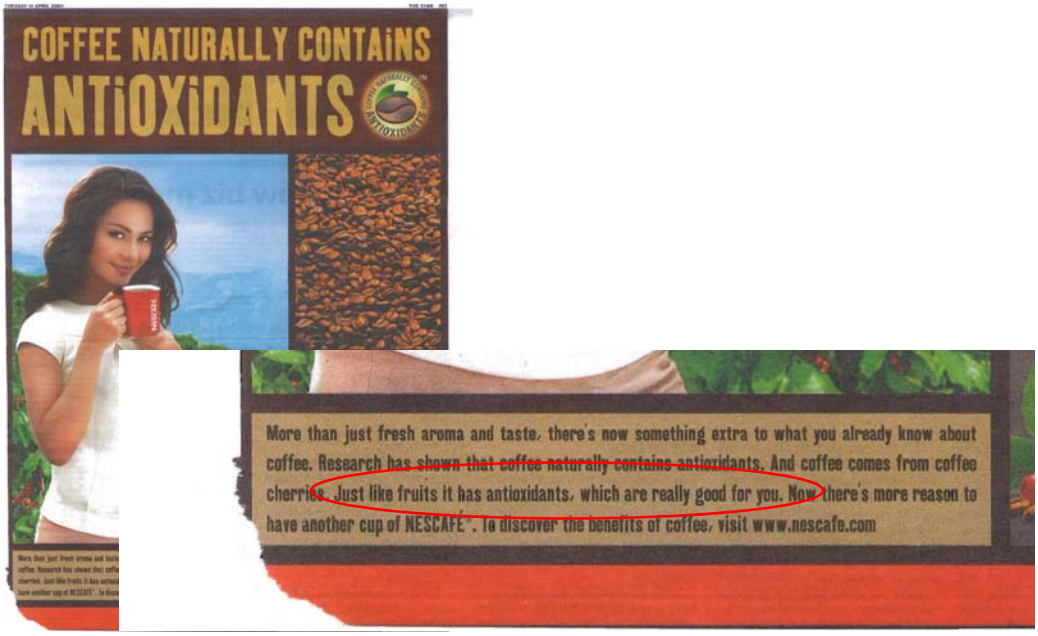
You may know these deliciously fragrant nuts by getting wafts from the water chestnut push-cart along the heartlands of Singapore or by nibbling on water chestnut cake. Native to China water chestnuts are also grown in Japan, Taiwan and Thailand. They are a popular ingredient in Chinese cuisine and are rich in carbohydrates, low in sodium and have almost no fat. They also contain a good source of fibre, vitamin B6, manganese, riboflavin, potassium and other nutrients.

Hazelnuts

Another favourite of chocolate-lovers all over the world, this nut is also used in other confectionary, nougat and pastry fillings. They are also popular in coffee drinks such as hazelnut Latte. Hazelnuts are native to the Mediterranean region and are more popular in Europe, the Middle East and Western Asia, compared to the United States. They are high in unsaturated fat content and high in protein, as well as thiamine, vitamin B1, B2 and B6, protecting against heart disease and cancer like most other nuts.

In addition to being used in everyday food, nuts can also be incorporated into pastries or desserts. The many health-giving properties found in nuts make them an ideal mid-day snack too! Cashews, walnuts, hazelnuts and almonds are among the most nutritious: between them, they contain a range of B and E vitamins which are good for energy and the skin. As you can see, nuts are actually good for you, provided you have no allergies. A handful of nuts, which can be quite satisfying, is a better snack than potato chips or candies! As they say, it's not always a bad thing to go nuts!

– **Advertisements with/without claims/indirect claims**

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SHAPE
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to maintain skin elasticity
Prebiotics ✓
to keep the intestinal tract clean and healthy
High bio-availability ✓
for better absorption
Concentrated essence ✓
✗ Added Sugar
✗ Colouring
✗ Preservatives
All the reasons why InnerShine Prune Essence gives you radiant skin.
Prunes are a valuable source of fibre and anti-oxidants. But that alone is not enough to give you the radiance every woman wants. For that you need InnerShine Prune Essence. Every bottle contains a powerful blend of ingredients that together, work wonders on you. And because it comes in liquid form, it has higher bio-availability which basically means the nutrients can be easily absorbed by your body. Drink a bottle every day and you'll soon be the object of envy.
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F&N
FRUIT TREE fresh
buah delima & manggis
tidak ditambah gula
minuman jus buah campuran
GROOVY juice
Purple is not only a groovy colour. In food, it's a pigment jam-packed with antioxidants and vitamin C which improve blood circulation and boost your immune system. F&N Fruit Tree Fresh 100 percent juice has a shot of this purply ingredient with its new fruit juice pairing of mangosteen and pomegranate! It's got mangosteen husks and tastes delish without artificial sweetener or sugar!

- Is the industry moving too fast on making claims, without sufficient evidence?
- Are such articles/write-ups misleading the consumer? Do they provide a rounded view of the current understanding on bioactives/polyphenols?
- Are regulatory agencies too slow, too strict in allowing health claims on bioactives/polyphenols to be made?
- Are regulatory agencies "obstacles" to efforts to inform/educate consumers of the health benefits of bioactives/polyphenols

- What are the legal provisions for making health claims on polyphenols?

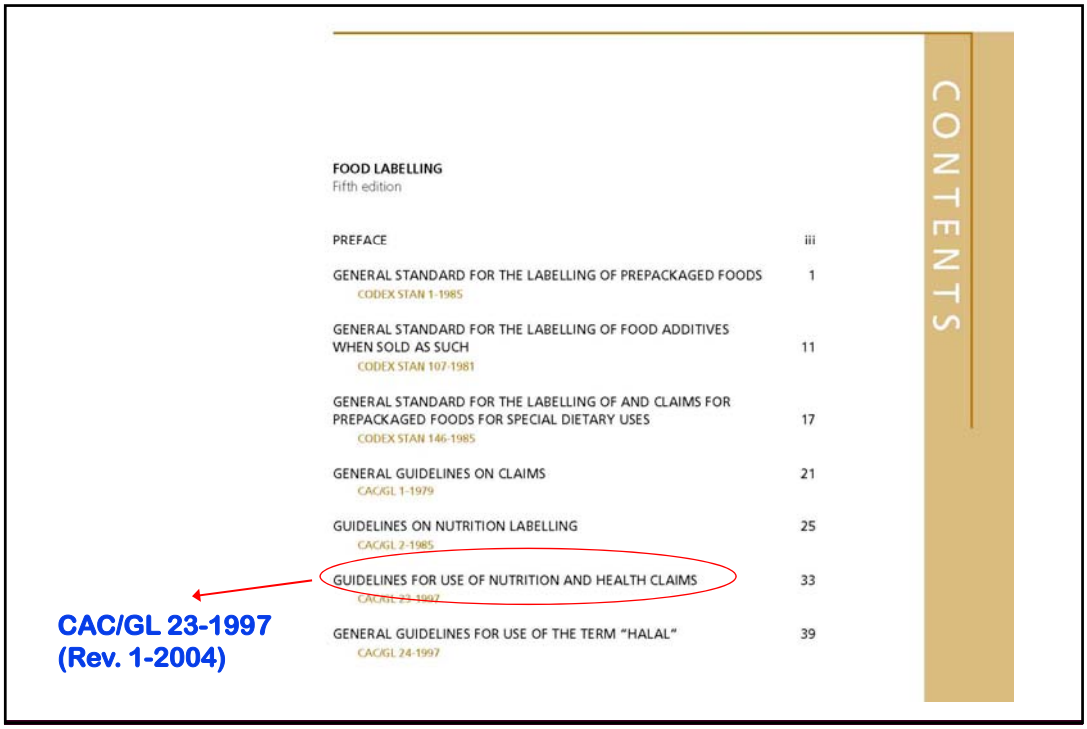
Legal provisions for claims ….

- Codex Alimentarius
- several Southeast Asian countries (Malaysia, Indonesia, Philippines, Singapore, Thailand)
- China and Japan
- focus on health claims of nutrients and bioactives (other food biologically active components)

Codex guidelines on nutrition and health claims ….

Codex Alimentarius guide to governments ……

Food labeling complete text (5th edn, 2008)



FOOD LABELLING
Fifth edition

CONTENTS

CAC/GL 23-1997 (Rev. 1-2004)

Health claims .....

- **Health claims means any representation that states, suggests or implies that a relationship exists between a food or a constituent of that food and health, includes**
  1. **nutrient function claim**
  2. **other function claim and**
  3. **reduction of disease risk claims**

Nutrient function claims

- describes the physiological role of the nutrient in growth, development and normal functions of the body, eg
  - Calcium aids in the development of strong bones and teeth
  - Iron is a factor in red blood cell formation

Other function claims .....

- describes specific beneficial effects of the consumption of a food constituent (bioactives) in improving or modifying a physiological function
- Considerable interest in role of bioactive components or functional ingredients (including polyphenols) in promoting health
- Example:
  - Plant sterols helps in lowering blood cholesterol

Reduction of disease risk claim …..

- relates the consumption of a food or food constituent (bioactives) to the reduced risk of developing a disease or health related condition
- Example:
  - Soy protein reduces risk to heart disease

Guidelines for scientific substantiation of claims

- Guidelines to assist governments in their evaluation of health claims for use by industry
  - expected to be adopted at step 5/8 in upcoming Commission meeting, July 2009
- Process for substantiation would include a systematic review of the scientific evidence
  - Identify criteria for substantiation
  - Identify the proposed relationship between the food or constituent and the health effect
  - Identify and categories all relevant studies
  - Assess quality of and interpret each study
  - Evaluate if a claimed relationship is substantiated

Guidelines for scientific substantiation of claims

- Criteria for substantiation
  - Should primarily be based on evidence provided by well-designed human intervention trials
  - Experimental and animal studies may provide supporting knowledge
  - Evidence should demonstrate a consistent association and with little or no evidence to the contrary
  - Totality of evidence should be identified and reviewed
- Specific safety concerns should also be addressed eg known health risks, consumption level from all dietary sources, consumption pattern

Nutrition & Health claims in Asia ….

….. Indonesia, Malaysia, Philippines, Singapore, Thailand, China, Japan

Input from series of ILSI SEA Region's Workshops 2001-2008 to address Issues Related To Nutrition Labeling and Claims…..

…. through a series of ILSI SEA

Series of ILSI workshops 2001-2008

- participated by officials of regulatory agencies in SEAsia, research scientists in China, Japan, Korea, Australia/New Zealand
- provide avenues for networking and explore harmonising these activities in the region
- Be familiarised with international and regional regulatory status and developments
- Share experiences in evaluating scientific data submitted for substantiation of claims
- Latest seminar and workshop 13-15 August 2008, Bangkok
- Only status of health claims highlighted here

Status of nutrient function claims

Country	Nutrient function claim
Indonesia	Yes, in new regulations to be enforced; 4 macro-nutrients (protein, fat, linoleic acid, carbohydrates), 8 vitamins, 3 minerals
Malaysia	23 claims for protein, 9 vitamins, 5 minerals
Philippines	Yes, according to Codex; no positive list
Singapore	26 claims for 3 macro nutrients (protein, lactose, dietary fibre), 7 vitamins, 5 minerals
Thailand	29 claims for protein, dietary fibre, 13 vitamins, 14 mienrals
China	60 claims for 8 macronutrients (energy, fat, protein, saturated fat, cholesterol, carbohydrate, sugar, dietary fibre), 6 minerals, 11 vitamins
Japan	17 claims for 12 vitamins, 5 minerals

Status of other function claims

Country	Other function claim
Indonesia	Yes, in new regulations to be enforced; dietary fibre (psyllium, inulin, oat), prebiotic, probiotic, plant sterol and stanol esters
Malaysia	21 claims for other food components (eg inulin, FOS, GOS, GOS+lcFOS mixture, polydextrose, resistant starch, sterol, beta-glucan, soy protein)
Philippines	Yes, according to Codex; no positive list
Singapore	7 claims for probiotics, prebiotics (eg inulin, oligofructose, GOS+lcFOS mixture
Thailand	Being discussed
China	Not permitted
Japan	FOSHU (797 products approved as at end August 2008)

Status of disease risk-reduction claims

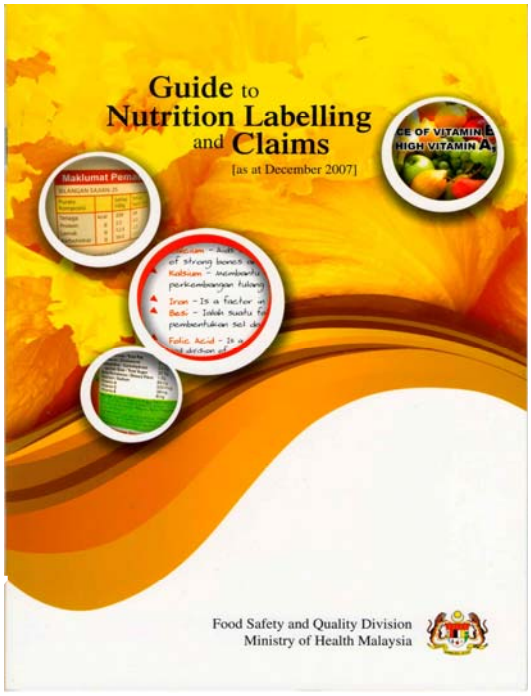
Country	Disease risk-reduction claim
Indonesia	Yes, in new regulations to be enforced; folate, calcium, dietary fibre psyllium, inulin, oat), plant sterol and stanol esters, soy protein, soy isoflavone
Malaysia	Not permitted
Philippines	Yes, according to Codex; no positive list
Singapore	Yes, permitted for selected nutrients and diseases (e.g. Ca+Vit D and osteoporosis; Na and stroke/ heart disease; saturated/trans fat and heart disease; whole grains, fruits + vege and heart disease/cancer)
Thailand	Not permitted
China	Not permitted
Japan	Only calcium and osteoporosis and folate and neural tube defect

Examples of other function claims - Malaysia

- 21 other function claims for non-nutrients also permitted, include
  - Several dietary fibres (eg High Amylose Maize Resistant Starch, inulin, GOS, FOS, GOS:FOS (90:10), beta-glucan, polydextrose)
  - Sialic acid
  - Soy protein
  - Patented cooking oil blend
  - Bifidobacterium
- All rising from petition from industry
- So far no applications related to polyphenols

- Permitted "other function claims" include
  - ..... helps reduce / lower cholesterol
  - ..... helps increase intestinal bifidobacteria / bifidogenic /prebiotic and helps to maintain a good intestinal environment
  - .... helps to lower to rise in blood glucose
  - .... helps to improve intestinal immune system of babies
- Specific conditions required for other function claims, eg
  - Minimum amount of the relevant "food component" that must be present
  - Additional labelling requirements, if relevant
  - Restriction to selected foods, if relevant

All function claims contained in Guide Book to assist industry and enforcement officers understand new regulations



- Industry may apply for new function claims using prescribed forms
- All applications reviewed by Expert Committee on Nutrition, Health Claims and Advertisement, MOH
  - Based on scientific data to substantiate proposed claim, preferably based on human intervention trials
- If approved by Expert Committee, application shall be submitted to higher level Technical Committee on Food Regulations for endorsement
- All companies can use the claims once they are published as government gazetttes
- Certainly opportunities for consideration of beneficial effects of polyphenols

Examples of other function claims - Singapore

- Probiotics
  - Helps to maintain a healthy digestive system
  - Helps in digestion.
  - Helps to maintain a desirable balance of beneficial bacteria in the digestive system.
  - Helps to suppress/fight against harmful bacteria in the digestive system, thereby helping to maintain a healthy digestive system

Examples of other function claims - Singapore

- Prebiotics
  - Prebiotic promotes the growth of good Bifidus bacteria to help maintain a healthy digestive system.
  - Inulin helps support growth of beneficial bacteria/good intestinal flora in the gut.
  - Oligofructose stimulates the bifido-bacteria, resulting in a significant increase of the beneficial bifidobacteria in the intestinal tract. At the same time, the presence of less desirable bacteria is significantly reduced

Health claims in Japan ….

- In Japan, health claims are permitted only for foods for specified health use (FOSHU)
- Legalized in 1991, it was meant to be an expansion of the 'health' food market
- defined FOSHU as foods officially approved to claim their physiological effects on the human body
- pre-marketing approval system set up: each food has to be proven to promote health on a case-by-case basis based on clinical trials
  - Up till August 2008, over 797 products have been approved

Progress of Nutrition and Health Claims on Food in Japan

<table>
<tr><th>year</th><th colspan="5">Types of Claims</th></tr>
<tr><td>1991
1994</td><td colspan="5">Foods for Specified Health Use (FOSHU) regulation system
(by MHLW)</td></tr>
<tr><td>1997
↓
2000</td><td colspan="5">Nutrition labeling standards
(Nutrient content claims, Nutrient comparative claims)</td></tr>
<tr><td rowspan="2">2001</td><td colspan="5">Food with health claims (FHC)</td></tr>
<tr><td colspan="3">Foods with Nutrient Function Claims (FNFC) (5 minerals and 12 vitamins)</td><td colspan="2">Foods for Specified Health Use (FOSHU)</td></tr>
<tr><td rowspan="4">2005</td><td colspan="5">Food with health claims (FHC)</td></tr>
<tr><td rowspan="3">Foods with Nutrient Function Claims (FNFC)</td><td colspan="4">Foods for Specified Health Use (FOSHU)</td></tr>
<tr><td rowspan="2">Ordinary FOSHU</td><td colspan="3">New Type FOSHU</td></tr>
<tr><td>Standardized FOSHU</td><td>Reduction of disease risk</td><td>Qualified FOSHU</td></tr>
</table>

Foods for Specified Health Use (FOSHU)

Seal of approval for other FOSHU	Seal of approval for Qualified FOSHU
	
Example of a claim: Ingredient X (functional ingredient) improves gastrointestinal condition	**Example of a claim:** This product contains XX and, although supporting evidence has not necessarily been established, this product might be possibly suitable for condition YY.

Main FOSHU products approved and the relevant ingredients

Main physiological effect	Principal ingredients exhibiting health functions
Improve gastrointestinal conditions	Oligosaccharides, bifidobacteria, lactic acid bacteria, dietary fiber & ingestible dextrin, polydextrose, guar gum, psyllium seed coat, etc.
Related to high blood cholesterol level	Chitosan, soybean protein, degraded sodium alginate
Related to high blood sugar levels	Indigestible dextrin, wheat albumin, guava tea polyphenol, L-arabiose, etc.
Related to high blood pressure	Lactotripeptide, casein dodecaneptide, tochu leaf glycoside (geniposidic acid), sardine peptide, etc.

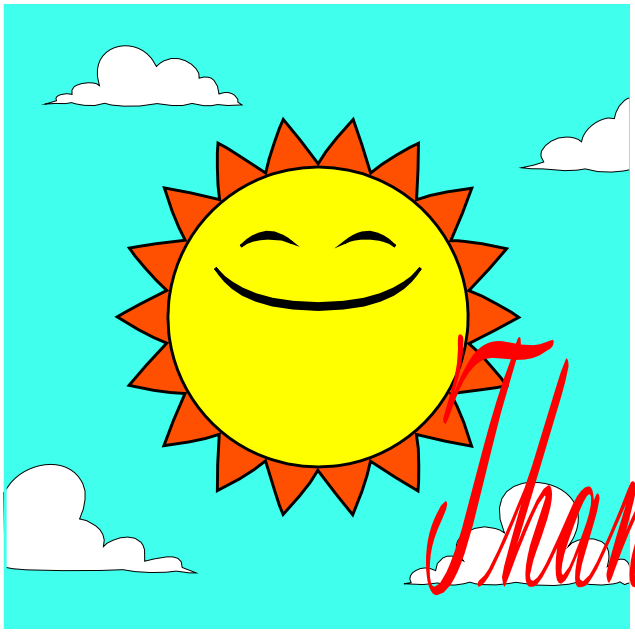
Main FOSHU products approved (2)

Main physiological effect	Principal ingredients exhibiting health functions
Related to dental hygiene	Palatinose, maltitose, erythrytol, etc.
Cholesterol plus gastro-intestinal conditions, triacylglycerol	Degraded sodium alginate, dietary fiber from psyllium seed husk, etc.
Related to mineral absorption	Calcium citrated malate, casein phosphopeptide, heme iron, fructo-oligosaccharide, etc.
Related to osteoporosis	Soybean isoflavone, MBP (milk basic protein), etc.
Related to triacylglycerol	Medium chain fatty acid, etc.
Fat burning; fat absorption; lower LDL cholesterol	Tea Polyphenols (e.g. catechins)

Concluding remarks ….

- There are sufficient legal provisions for making health claims on polyphenols
  - from an international perspective (Codex) as well as national authorities in the region
- Regulatory agencies are not against informing the consumer of the potential beneficial effects of consuming foods with polyphenols
  - however claims must be substantiated by appropriate scientific data
  - such information must be appropriately utilised by consumers
  - must be permitted within the permitted regulatory system
  - the food must certainly contain sufficient amounts of the polyphenols to make the claims!

- Those communicating substantiated health benefits on polyphenols must be sieved out from those making wild claims
- Whilst the science of the health benefits of polyphenols continue to be unravelled, the regulatory framework for making these claims need to be improved in the region
- Although there are legal provisions for making these health claims
  - The regulatory framework, however, needs to be developed to facilitate the reviewing and approval of health claims
  - Regulators should adopt a reasonable approach to requirements for scientific substantiation



Thank You !