

Congress Abstract Book

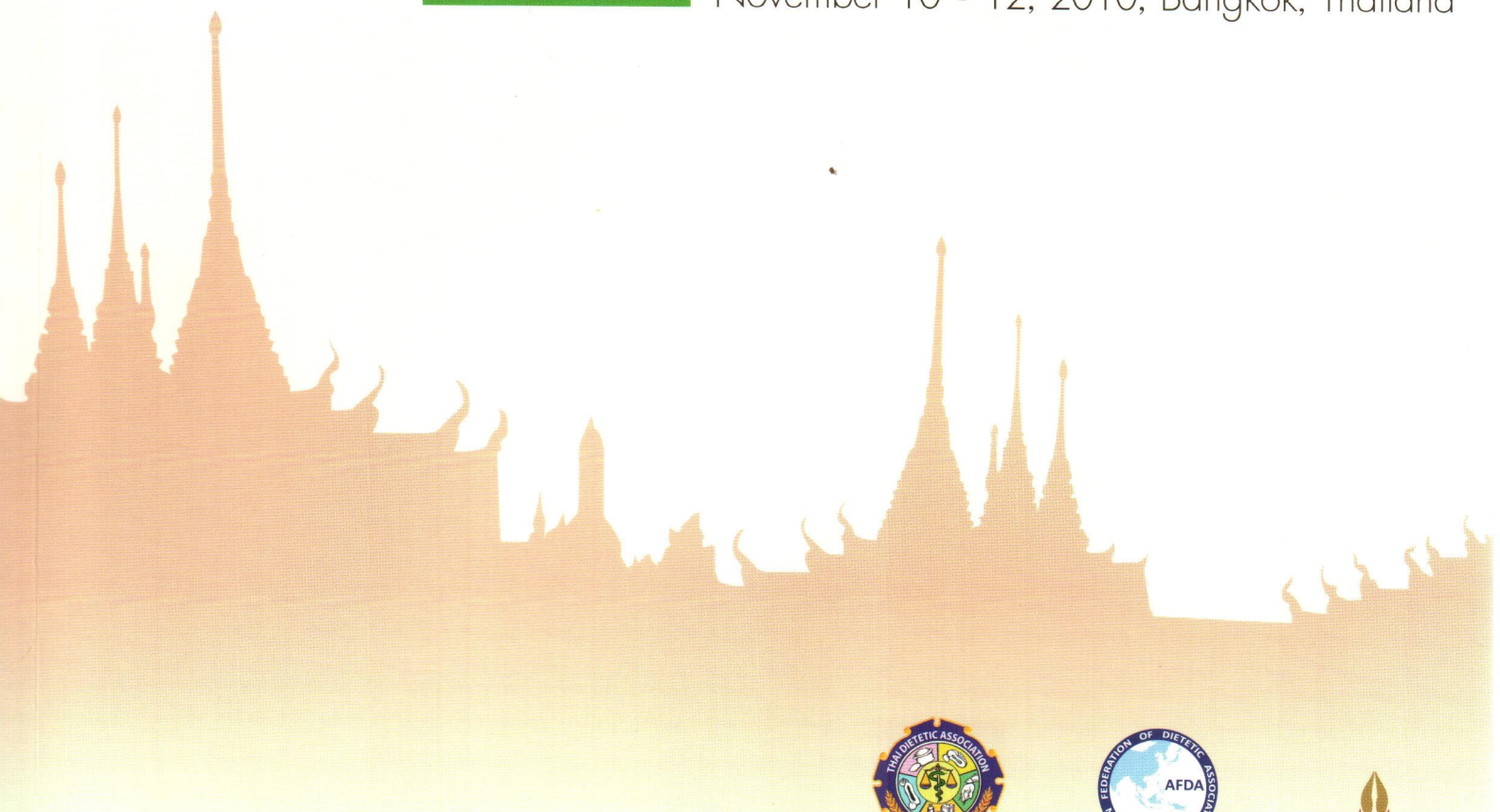
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November 10 - 12, 2010, Bangkok, Thailand





ASIAN ETHNIC DIETS AND TRADITIONAL HERBAL MEDICINES IN THE PERSPECTIVE OF FUNCTIONAL FOODS AND HEALTH PROMOTION

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An overview of Asian ethnic diets and traditional herbal medicines in the perspective of functional foods and health promotion. These days, Asian diets become more favorable internationally. It is undeniable that one of the reasons for the popularity is Asian diets have developed an image of giving positive effects toward health and body fitness. Asian culinary generally is less in animal source foods but it is rich of vegan-based foods. Moreover, many Asian countries use a lot of spices and/or herbs which are well known for their active functionalities.

The role of Chinese culinary in medicinal world is recorded in the history and the famed modern functional foods developed by Japan have been globally accepted. The availability of various food ingredients, supplemented with the diversity ethnic groups as well as the ancient cultures for combining food and medication has made the Asian diets being able to create opportunities to provide functional foods with a wide array of physiological activities that are interesting for further research.

Indonesia with 17,504 islands, 1,128 ethnic groups, 3,025 animal species, and 47,000 plant species promises a diversity of functional foods valuable to be studied. Furthermore, along with China with its Traditional Chinese Medicine (TCM), India with its Ayurveda, Indonesia has "jamu" as its traditional herbal medicine. "Jamu"-type functional foods become more favorable and easy to find in Indonesian food markets. This presentation will highlight the potentiality of Asian diet and TCM in the world of functional foods and health promotion, in particular by using exploration results and studies conducted in Indonesia.

Asian Ethnic Diets and Traditional Herbal Medicines in the Perspective of Functional Foods and Health Promotion



*Focus on
Indonesian Standpoint*

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Presented in Asian Congress of Dietetics,
Bangkok, 10-12 November 2010

Outline

- Asian Diets
- Diversity in Indonesian Diets
- What is "Jamu"?
- Current Functional Foods in Indonesia

Introduction



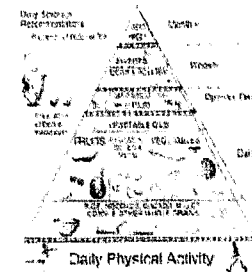
Asian diet
become more
favorable



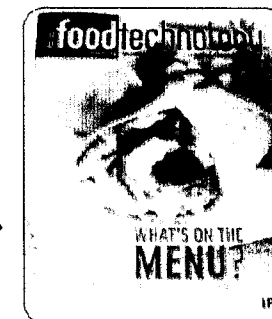
Many Asian
do benefit
from their
traditional
diet

Special Report in
Food Pacific
Manufacturing
Journal
September 2009

The Traditional Healthy Asian Diet Pyramid




Emphasizes traditional
ingredients and is based on
balance and harmony in foods





A healthy eating guide should track
back to tradition but acknowledge
the challenges of modern lifestyles


Towards an Asian Food Pyramid, Food
Pacific Manufacturing Journal, Sept 2009




China, Japan, Thailand, the Philippines and India, countries long known to relatively free of the heart disease, obesity and cancer



Rich in vegan-based food



Uses a lot of spices and herbs



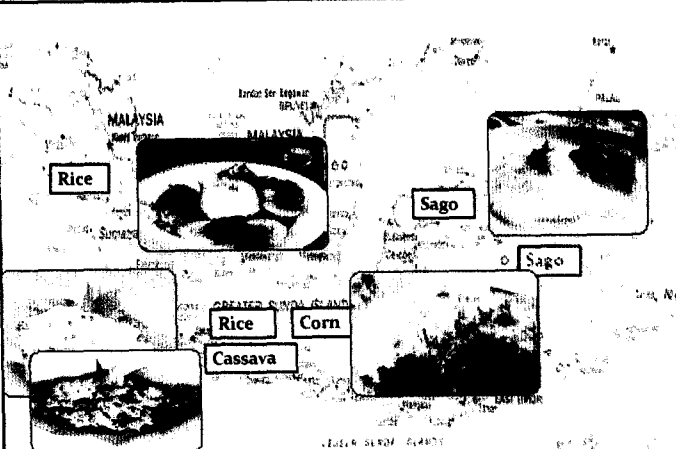
Diversity in Indonesian Diets



With its various ethnic groups, Indonesia is rich in culinary cultures



Indonesia



Rice

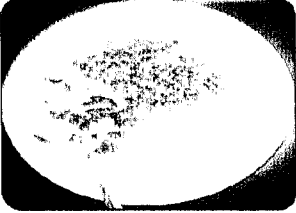


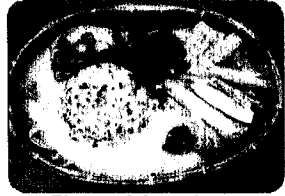
Sago

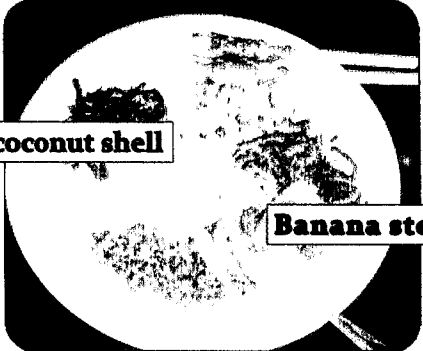
Rice

Corn


Cassava

Various in Staple Foods

 <p>Red rice</p>	 <p>Colored by cucurma</p>
 <p>Flavored by coconut milk and spices</p>	 <p>Flavored by spices and "Oncom"</p>







Young coconut shell



Banana stem

No Waste

 <p>Urapan</p>	 <p>Semanggi</p>
 <p>Gado-gado</p>	 <p>Rujak cingur</p>



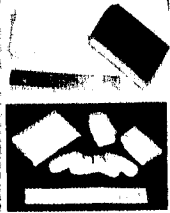
Indonesian culinary having strong relationship to religion ritual or cultural ceremony



Tempe (tempeh)

Tempe has been known and produced by Indonesians for centuries, found in many parts of Indonesia, particularly important in Java and Bali.

Advantages of tempe arose during World War II when many prisoners of Japanese had to rely upon tempe as a major protein source----even malnourished prisoners suffering from dysentery were able to digest and tolerate the beans in the form of tempe while the unfermented soybeans were un-digestible (Stahel, 1946; Smith and Woodruff, 1951; Grant, 1952).

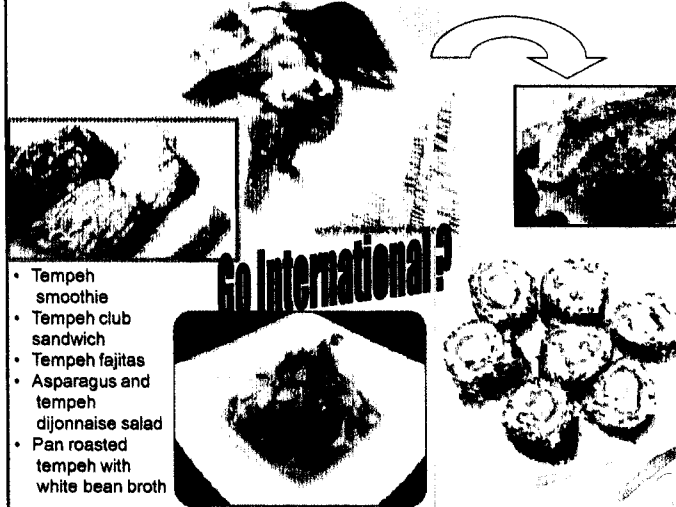


Functional Benefits


- Medium-chain peptides (5-10 amino acids) of tempe hydrolysate showed hypotensive ability by inhibiting the activity of *Angiotensin I Converting Enzyme* (ACE). Tempe fermented with mixed-wild cultures (laru pasar) has higher activity comparing to the pure-innoculum.
- Transformation of Isoflavon during tempe fermentation producing daidzein and genistein contributed to the anti-oxidation and anti-angiogenic activities.
- 6,7-4-trihydroxy isoflavon from tempe has been reported as a compound with anti-hemolysis role . This compound has also been reported as an active compound which able to reduce the cholesterol level as well as inhibiting the LDL (Low Density Lipoprotein) formation.
- Tempe with its beta-sitosterol content also showed hypocholesterolemic potency
- Wang et al (1969) reported that *R. Oligosporus* NRRL 2710 produces an antibiotic active against a number of Gram-positive bacteria including *Staphylococcus aureus* and *Bacillus subtilis*

Go International!

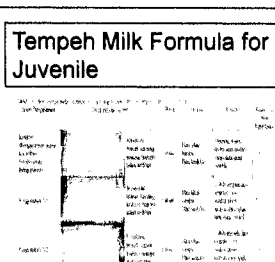
- Tempeh smoothie
- Tempeh club sandwich
- Tempeh fajitas
- Asparagus and tempeh dijonaise salad
- Pan roasted tempeh with white bean broth



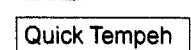
Newly Listed as 100 Indonesian Innovations



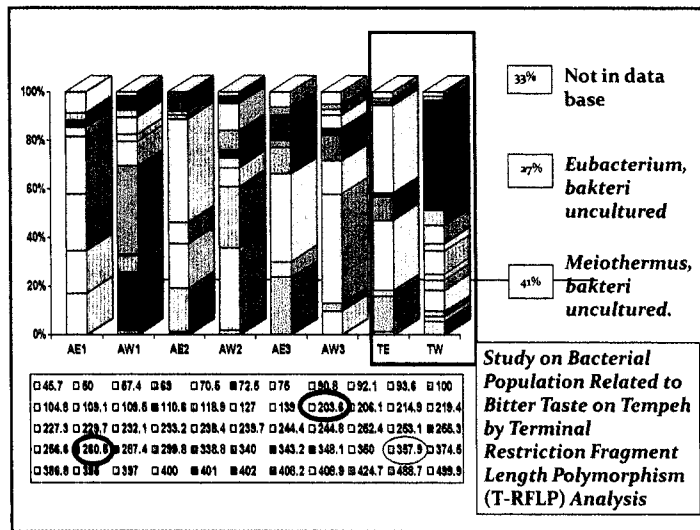
Tempeh Ice Cream



Tempeh Milk Formula for Juvenile




Quick Tempeh



- ### Sorts of tempe
- **Tempe benguk** : fermented velvet bean (*Mucuna pruriens*) seeds; *Rhizopus oryzae*, *R. oligosporus*, *R. arrhizus*; solid, greyish white with a violet tint, typical smell, slightly sweet sour
 - **Tempe gembus** : fermented solid residue of soybean curd; *Rhizopus spp.*, *R. Oryzae*, *R. oligosporus*; solid, soft, greyish white, slightly beany smell, bland taste
 - **Tempe kecipir**: fermented Winged bean (*Canavalia ensiformis*) seeds; *R. oryzae*, *R. arrhizus*, *R. oligosporus*, *R. achlamydosporus*; solid, yellowish to brownish white, sharp beany smell bland taste
 - **Tempe koro pedang** : fermented Jack bean seeds; *R. oryzae*, *R. arrhizus*, *R. achlamydosporus*; solid, light yellowish white, typical beany smell, bland taste
 - **Tempe lamtoro** : fermented wild tamarind bean (*Leucaena leucocephala*); "ragi tempe" (traditional tempe starter)
 - **Tempe kedele** : fermented soybean--soybean, tapioca flour, maize grits, young papaya fruit, cassava, coconuts press cake; *Rhizopus sp.*, *R. oligosporus*, *R. Oryzae*; solid, white to greyish white, pleasant aroma, bland taste


Oncom


Oncom is a cakelike product prepared by fermenting a soaked, cooked substrate consisting of peanut press-cake as the major ingredient, along with solid waste of tapioca and solid waste of tofu, using culture of microorganism with *Rhizopus* or *Neurospora* species predominating. Oncom is produced mainly in West Java. It is an important ingredient of the daily menu of Sundanese, particularly those of the lower class of the community.



Oncom hitam: black fermented peanut press cake; solid greyish black, pleasant smell, bland taste; *Mucor spp.*, *Rhizopus spp.*
Oncom merah : orange fermented peanut press cake; solid, orange to reddish orange, pleasant smell, bland taste; *Neurospora spp.*
Oncom merah Bogor: orange fermented solid residue of soybean curd; solid, orange to reddish, pleasant smell, bland taste; *Neurospora spp.*

Oncom merah---Total protein content remains constant during fermentation: total fat content decreases slightly. Calcium content increases significantly fro, 204 to 226 mg/ 100 g substrate and carotene increased from 10.3 to 22.0 I.U./ 100 g substrate (Ganjar and Slamet, 1972)



- ### Indonesian Functional Drinks
- **Slimming tea**: various composition
ex: theae folium (80%) plus extract of parameriae (6%), extract of guazumae (6%), extract of foeniculi (4%), extract of curcumae (4%)
 - **Jelly grass**: "cincau hijau" (green), "cincau hitam" (black)
 - **Newly introduced**: aloevera, wild-horse milk
 - **Mix-spices type**: "bir pletok", "cinna-ale", "mada
- 

Indonesian Functional Drinks

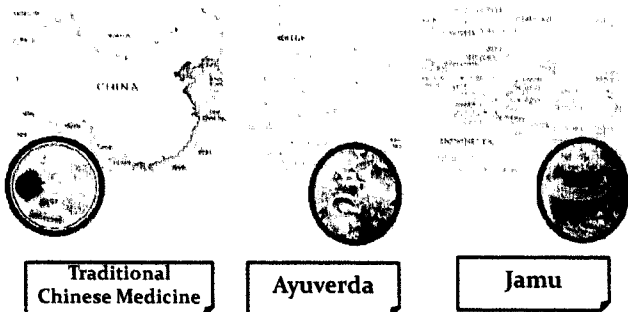
- **Ginger-based type:** "wedang jahe", "bajigur", "bandrek", "sarabba"
- **Natural sources:** coconut water, piper bettle decoction, corriander decoction, "wedang jeruk nipis" (local-lemon juice), tamarind juice, "secang" tea, ylang-ylang tea
- **Jamu type:** "beras kencur", "kunir asam", "galian singset", "sari temulawak"



What is "Jamu"?



Introduction



Jamu

is well-known as Javanese herbal medicines as well as traditional functional drinks

has been practiced for many centuries in the Indonesian community to maintain healthiness & to treat diseases

Jamu recipes were passed down orally, some special ones were even immortalized in songs and chants, such as those found in *Serat Centini* (A. Sumardono and M. Hanusz, 2007)



Jamu-type Functional Drinks

Traditionally divided as :

Bitter Type

contains ingredients with peculiar property, such as *pegal linu* (stiffness-relief) and *galian singset* (body shape-purpose)

Sweet Type

tend to be used as "threat-drink" in order to mask the bitter after taste, i.e. *beras kencur* and *kunyit / kunir asam*



Serving Jamu



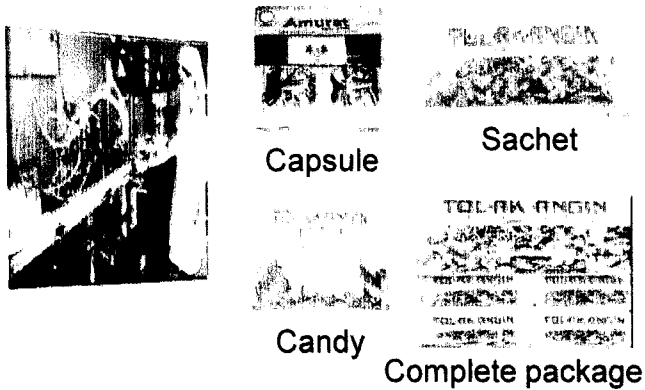
Jamu stalls



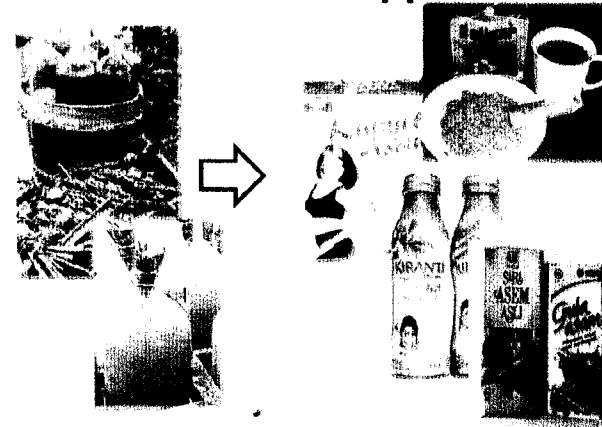
Jamu Café ?



Technology implementation



Transformation of Appearances

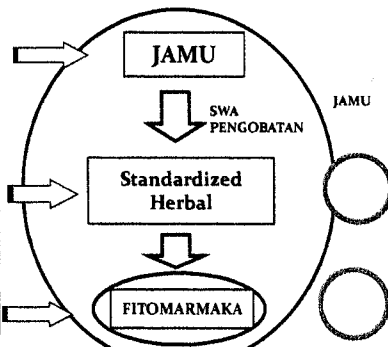


Standardization Policy and Direction of Natural Ingredient Medicines Development in Indonesia

- Therapeutic effects
- have to be supported by empirical data

Efficacy has to be proved in pre-clinical trials and requires standardization on actives ingredients

Clinical trials





PERATURAN KEPALA BADAN PENGAWAS OBAT DAN MAKANAN REPUBLIK INDONESIA NOMOR HK 00.05.52.0685 TENTANG KETENTUAN POKOK PENGAWASAN PANGAN FUNGSIONAL

Functional Drink with the Labelling



Challenges in Jamu

- 1 • Over-claimed
- 2 • Limited Scientific Approves
- 3 • Fluctuation in Quality
- 4 • Second Class Image –lower income society





Current Functional Foods in Indonesia



`Lalapan` ?? (West Java`s traditional salad)

a side-dish including several kind of raw, boiled, or steam vegetables, served with chili sauces



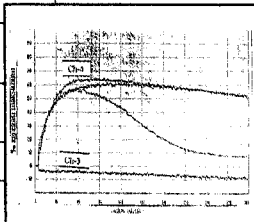
"Lalap" has been believed as a daily diet with a lot of beneficial impact on human health and beauty.

MAX. PLATELET AGGREGATION ACTIVITIES OF VARIOUS LALAP

Lalap	Max. Aggregation (%)	
	Control	Sample
Lettuce	48,2	71,4
Kemangi	49,1	73,6
Pohpohan	63,2	75,5
Leunca	42,3	48,2
Kemang leaves	48,2	18,6
Kedondong leaves	64,5	0,0
Papaya leaves	51,8	27,3
Tomato	48,2	18,6
Long bean	64,5	61,4
Cucumber	51,8	50,9
Cassava leaves	51,8	38,6
Cabbage	46,8	44,1

D₅₀ OF LALAP WITH SIGNIFICANT ANTI PLATELET AGRREGATION ACTIVITY

Name of lalap	D ₅₀ (mg extract/ml PRP)	Yield (% bb)	Nilai D ₅₀ (mg lalap/ml PRP)
Kemang leaves	20.05	21.70	92.40
Kedondong leaves	5.11	11.95	42.76
Papaya leaves	27.95	29.47	94.84
Tomato ^c	13.23	44.70	29.60



Utilization as functional food ingredients



Extract of kemang leaves, kedondong leaves and tomato were suitable for jelly products. Additional of extracts up to 8 % into the jelly agar formula were still accepted by panelists. Papaya leaves extract gave un-acceptable bitter taste.

Objective :
Mixture based formula drink with higher antioxidant activity comparing to the other commercialized traditional functional drinks as well as acceptable in its flavor and colour

1. Preparing extract of each Ingredients
2. Formulation a model drinks
3. Optimization the selected formula by Mixture Experiment approach using *Design Expert 7.0*® soft-ware
4. Storage stability in different level of temperature

- Sensory evaluation
- Antioxidant activity
- Proximate tests
- Total polyphenols content
- Total microbes

Sensory properties of model drink with different levels of total plants extract concentration (% b/v)

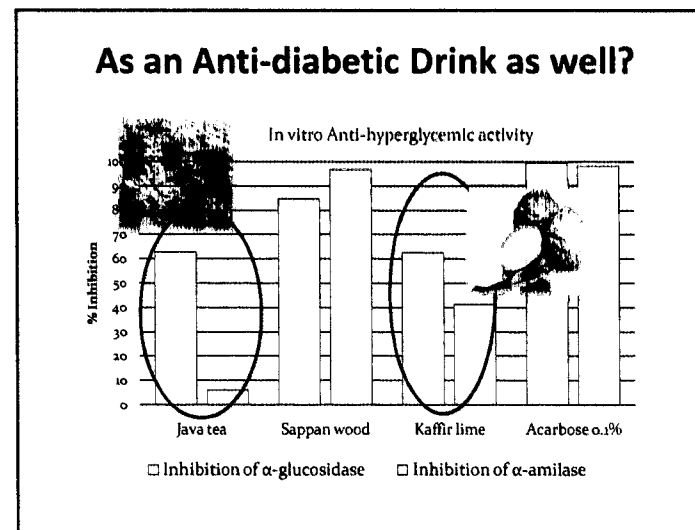
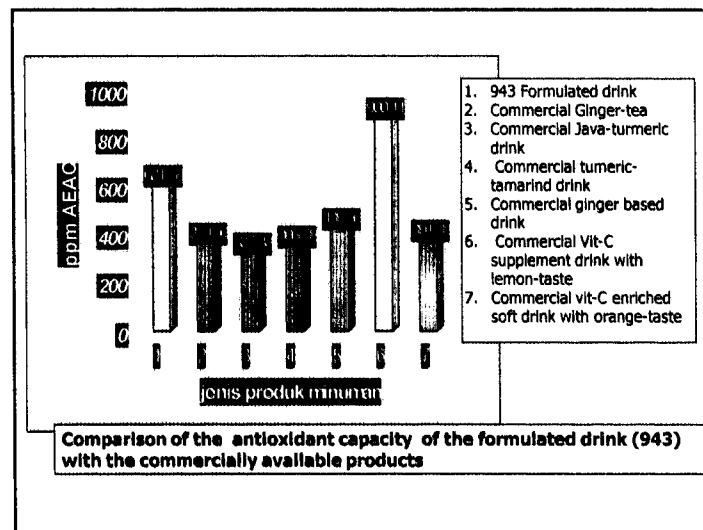
Total plant extract conc. (% b/v)	Sensory properties (per 100 ml)
3 g/ 100 ml	Dominant in sweet, spicy flavor very weak-almost undetectable
5 g/ 100 ml	Still dominant in sweet, stronger spicy flavor, preferable
10 g/ 100 ml	Sweet, detectable spicy flavor, slight bitter after-taste, preferable
15 g/ 100 ml	Sweet, strong spicy flavor, strong bitter after-taste, un-referable
20 g/ 100 ml	Dominant in bitter, spicy flavor strongly detectable, bitter after-taste "jamu"-like, un-preferable

Three selected formulation based on the optimization using Design-Expert 7.0® soft-ware

Solutions

Number	Jaje	Secang Kurnia kusing	Temulawak	Lemon	Antioksidan	Citarasa	Desirability
1	15.000	10.000	60.000	2.000	13.000	500.458	3.77341
2	15.000	36.500	36.500	2.000	10.000	442.888	3.72266
3	42.272	10.000	35.728	2.000	10.000	441.767	3.19737

3 Solutions found



Pennyworth (*Centella asiatica*)



Others name are pegagan or pegaga.

It is believed by Sasak ethnic in Indonesia that *Centella asiatica* can be used to improving their memory



Centella asiatica also can be found in Sundanese Traditional Salad.

Pennyworth (*Centella asiatica*)

Mechanism of *centella asiatica* in improving brain ability

- Dendritic Aborization
- Increase AChE
- Inhibit Phopholipase A2
- Preventing Oxidative Damage

Rao et al., 2005, Barbosa et al., 2008, Shinomol and Muralidhara, 2008

Katuk leaf (*Sauropus androgynus*)



Sauropus androgynus is traditionally consumed by Indonesians and is believed to increase breast milk production during lactation.

Young Katuk Leaves

Increased the expression of genes in lactating mice

Prolactine 9.04 fold
Oxytocin 2.25 fold

Mature Katuk Leaves

Increased the expression of genes in lactating mice

Prolactine 15.75 fold
Oxytocin 25.77 fold



Soka et al., 2010

Andaliman (*Zanthoxylum acanthopodium DC*)

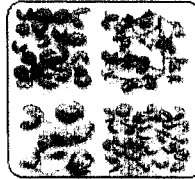


- Fruit is utilized by Mandailing and Angkola ethnic groups especially in "naniura" (raw meat dishes)
- Potent odorant: Citronellal, Limonene
- Trigeminally active compound: 2E, 6Z, 8E, 10E-N-(2'-methylpropyl)-dodecatetraamide
- Antioxidant, anti-microbes and immunoregulator activity

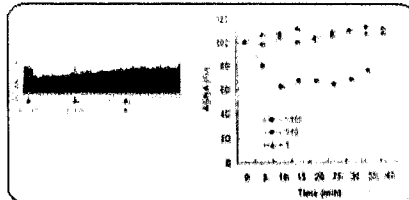
Irene Triyanti Hadiprodjo, and C. Hanny Wijaya (2000)

Andaliman

Assessing physiological functions of substances of *andaliman* by determining the changes in autonomic nerve activities after administration or after olfactory stimulation of the extract in urethane-anesthetized rats using electrophysiological technique



Zanthoxylum sp



Effect of intraduodenal Injection of Andaliman (1g was homogenized with 5 ml of water) on adrenal sympathetic nerve activity (ASNA)

Having potencies:

- Anti-diabetic
- Anti-hypertensive action
- Induce relaxation
- Anti-obesity (scent)

(Dr. K. Nagai's report, 2008)

Jambolan (*Syzygium cuminii* L.)

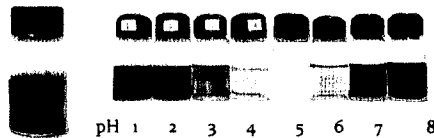


- Known with many different names : *Eugenia cumini*, Java plum, black plum, jambolan, jamblang, jamun, etc
- Containing anthocyanins pigment : cyanidin rhamno glucoside, petunidin and malvidin (Swadesi, 2004; 2007)
- Having moderate antioxidant activities equivalent with BHT activity—correlate with the anthocyanins availability, higher during the maturity (fruit color from green to dark purple) (Lestario, 2003)
- Knowing as traditional medicinal plant —folklore as : anti-diabetic, anti-diarrhea, anti-cholesterol

Potential natural colorant with antioxidant activities ?



Jambolan fruits



Extract of fruit's peels

Most stable at pH 3



Model drink

Nilai IC ₅₀ (µg/ml)		
Scavenging radikal DPPH	Scavenging Radikal Superoksida	Scavenging radikal Hidroksil
23.02 ± 0.88	1.85 ± 0.04	257.27 ± 4.32

Buah Merah (*Pandanus conoideus*)





Papua native consuming this fruit in their staple food (mixing of tubers and vegetables)—baked and squeezed to obtain the oil and paste

Types of fruit : *Ogi* or *barugum*, *maller*, *wonna*, *bullur* or *wanggeni* (yellow, highest in active compounds content), *kanenen*, *kwambir*, *muni* etc

Claims: tonic, HIV/AIDS prevention, immunity enhancement, anti-cancer, reducing high blood pressure, stroke-prevention, anti-osteoporosis, diabetes mellitus healing, eyes health, improving brain-power

Photo from: H Machmud Yahya and Benard T. Wahyu Wiryanta

Buah Merah

Tabel 1. Kandungan gizi buah merah

Energi	996 kkal/100g
Protein	3.300 mg
Lemak	98.100 mg
Serat	50.800 mg
Kalsium	84.000 mg
Fosfor	30 mg
Besi	2,44 mg
Vitamin B1	0,90 mg
Vitamin C	26,70 mg
Niasin	1,9 mg
Air	94,80 mg

Sumber: Buletin Tumbuhan, 2006, KIKKI, Januari 2006

Tabel 2. Kandungan senyawa aktif pada buah merah


Total karotenoid	12.000 ppm
Total tokoferol	11.000 ppm
Betakaroten	700 ppm
Alfa tokoferol	600 ppm
Asam oleat	58 %
Asam linoleat	8,8 %
Asam linolenat	7,8 %
Dakronat	8,0 %

Sumber: Buletin Tumbuhan, 2006, KIKKI, Januari 2006

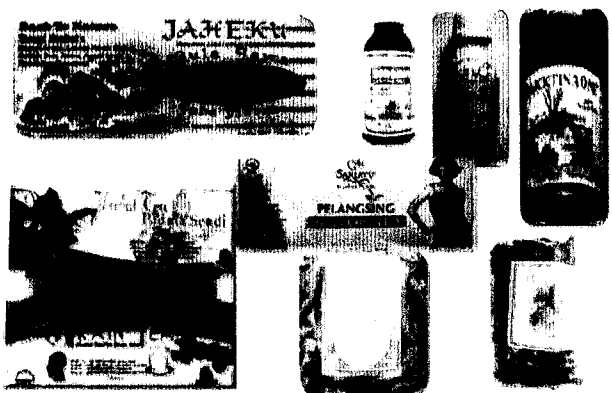
Non-nutritive active compounds

Source: Khasiat dan Manfaat Buah merah, Yahya & Wiryanta, 2005

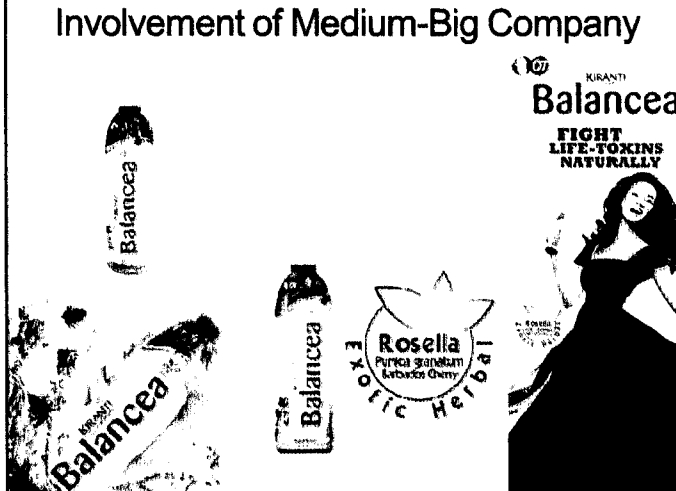
Recently Marketed Functional Foods

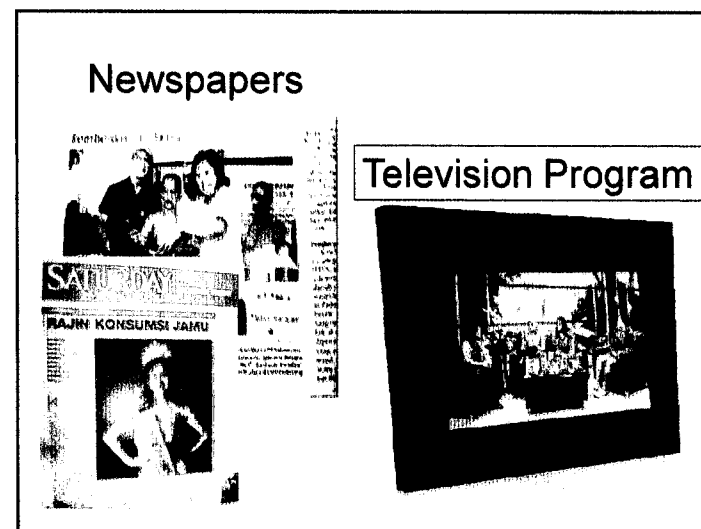
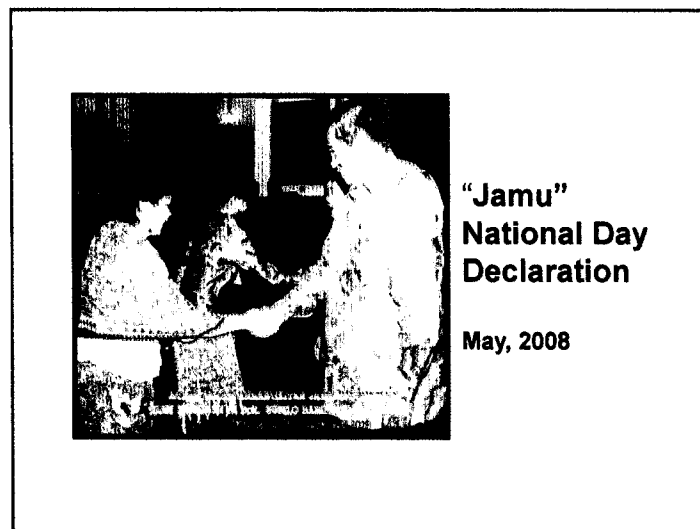
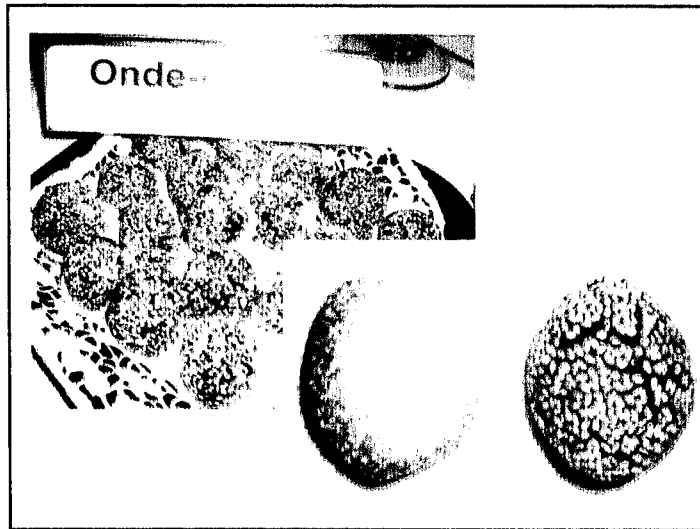


Recently Marketed Functional Drinks



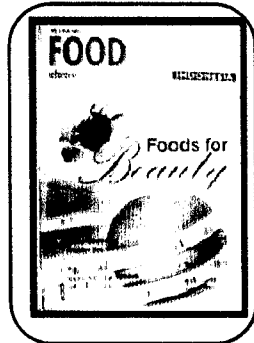
Involvement of Medium-Big Company



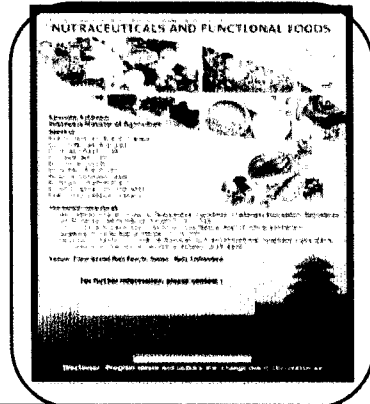


Journals Publication and Seminars

Journals Publication



Seminars

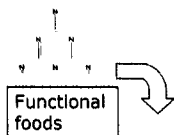


Today's consumers

- 90% agree that certain foods have benefits that go beyond basic nutrition
- 79% believe that some foods contain active components that can help with current health problems
- 76% think these substances can reduce the risk of disease and improve long-term health
- 56% feel that foods can also be used to reduce their use of drugs and other medical therapies

(Data sources: 2009 International Food Information Council; 2007 USA HealthFocus Trend Report.)

Courtesy of Prof. Zhou Weibiao



Food Challenge

How to compromise the healthiness of Asian traditional diets into a modern life style?

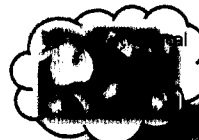
How to harmonize the bioactivities' dose with the flavor and other functionalities in foods?

How to save the valuable ingredients and the local wisdom from vanishing?



Healthy and Tasty Foods → Basic Human Request?

Khaawp khoun kha
Terimakasih
Thank you



Acknowledgements:

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Students and colleagues

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