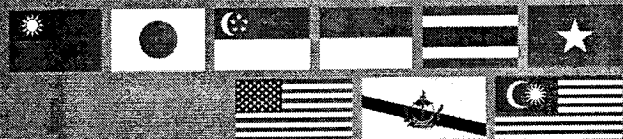


2008 International Symposium



on Innovations in Food Processing

2008 創新食品加工技術國際研討會

Processings

Nov. 20, 2008

NPUST, Pingtung, Taiwan

- 主辦單位 ① 台灣食品科學技術學會
② 國立屏東科技大學食品科學系
協辦單位 ② 國立屏東科技大學國際事務處
贊助單位 ② 行政院國家科學委員會

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2008 International Symposium on Innovations in Food Processing

Date: Thursday 20th November, 2008

Place: International Conference Hall, National Pingtung University of Science and Technology

Time	Agenda
0900-0930	Registration
0930-0945	Opening Ceremony
Keynote Lecture	
0945-1025	Prof. Philip E. Nelson (USA) The Evolution and Development of Aseptic Bulk Storage and Bag-in-box Technologies
1025-1045	Refreshment & Group Photographing
Session I	
Moderator: Dr. Jen Pin Chen (Taiwan)	
1045-1115	Dr. Nobuya Yanai (Japan) Purification and Concentration of Antioxidative Dipeptides Obtained from Chicken Extract and Their Application as Functional Food
1115-1145	Dr. Siree Chaiseri (Thailand) Flavor Protection through Starch Inclusion Complexes
1145-1215	Prof. Tzou Chi Huang (Taiwan) Functional Food Development in Taiwan- <i>Toona sinensis</i> as an Example
1215-1345	Lunch
Session II	
Moderator: Mrs. Hajah Roainah Haji Abd Rahman (Brunei)	
1345-1415	Prof. Nik Ismail Nik Daud (Malaysia) Intellectual Property Considerations in Developing New Products and Food Businesses
1415-1445	Dr. Cheng-Ming Chang (Taiwan) RFID and WSN Applications for Food Supply Chain and Processing Control
1445-1515	Dr. Chung Lim Law (Singapore) Recent Developments in Drying of Foods
1515-1545	Refreshment
Session III	
Moderator: Dr. Yuan-Kuang Guu (Taiwan)	
1545-1615	Prof. Dzuan Luu (Vietnam) Developing of Traditional Food in Vietnam
1615-1645	Prof. C. Hanny Wijaya (Indonesia) Current Perspective of Research Development on Technologies and Health Benefits of Indonesian Traditional Foods
1645-1715	Dr. Jiing Yang Wu (Taiwan) Innovation of Grain Products by Extrusion
1715-1730	Closing Ceremony

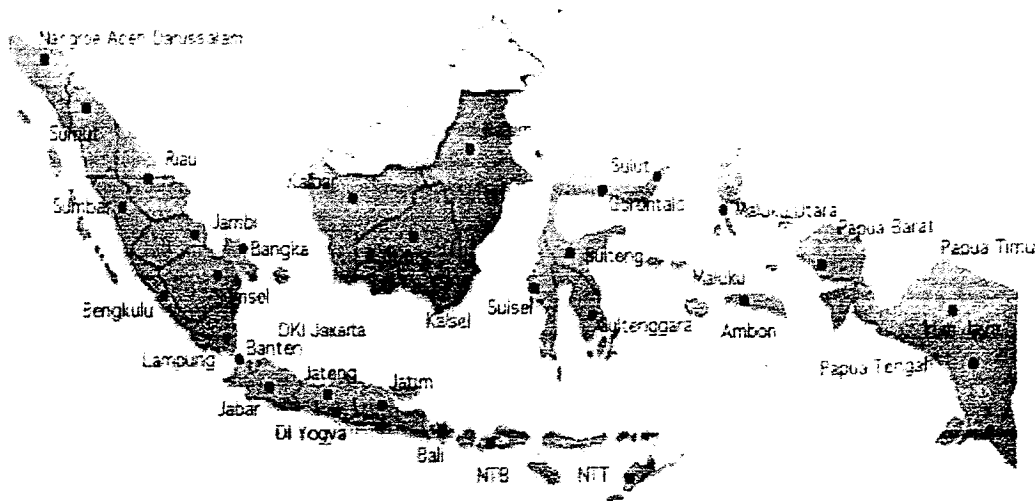
Current Perspective of Research Development on Technologies and Health Benefits of Indonesian Traditional Foods



C. Hanny Wijaya
FST-Bogor Agricultural University (IPB)
Indonesia

International Symposium on IFP
Taiwan, November 20th, 2008

Indonesia is a tropical archipelago laid across the equator



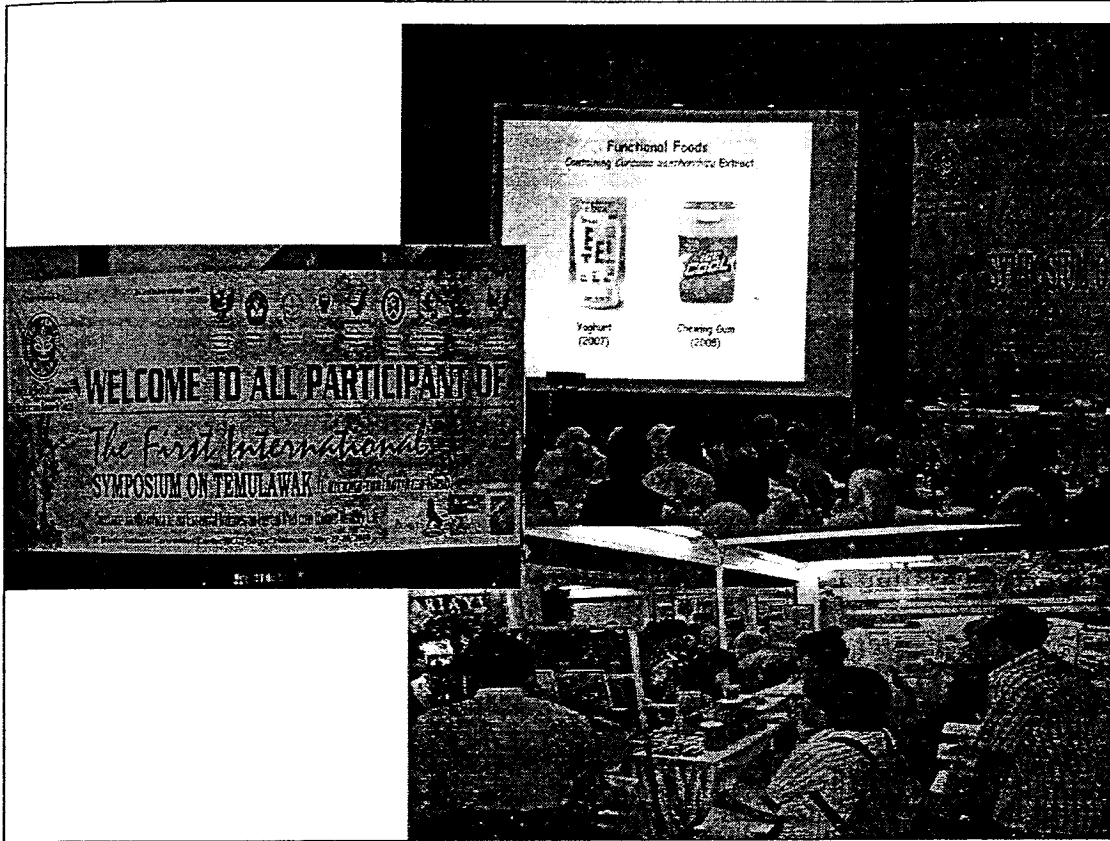
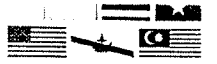
Indonesia provides a lot of tropical natural ingredients to be prepared as foods



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

Some Researches on Food's Bio-activities

- Astawan, M.; Yasni, S.; Suliantri; Olih. 1997. Study on the Potency of Soybean-Rice Mixed Tempe Hydrolysate as a Hypotensive Substance to Decrease Blood Pressure of Rats.
- Murhadi; Soekarto, TS; Jenie, BSL, Apriyantono, A; Yasni, S. 2004. Spectroscopic characteristics of Antibacterial Components of Atung (*Parinariium glaberrimum* Hassk).
- Sarastani, D; Soekarto, ST; Muchtadi, TR; Fardiaz, D; Apriyantono, A. Antioxidant activities of *Parinariium glaberrimum* Hassk extracts and their fractions.
- Septiana, A.T.; Zakaria, FR.; Sulistiyani. *Ginger (Zingiber officinale* Roscoe) Extracts Inhibits LDL Oxidation..
- Suryono. 2003. Dadih: produk olahan susu fermentasi tradisional yang berpotensi sebagai pangan probiotik.
- Tejasari; Zakaria, F.R.; Sajuthi, D. 2003. Effects of bioactive Compounds of ginger (*Zingiber officinale* Roscoe) roots on B Cell Lymphocyte Function in in vitro system.
- Wresdiyati, T.; Astawan, M.; Adnyane, IKM. 2003. Anti-inflammation Activity of Ginger (*Zingiber officinale*) Oleoresin on Kidney of Rats under Stress Condition.
- Astuti P. 2004. Characterization of bioactive Compounds Isolated from Indonesian Marine Sponge Collection
- Mahendratta M. 2005. The Combination of spice extract and re-distilled liquid smoke on minimizing hydrazine formation in smoked kembung fish (*Rastrelliger* sp).
- Sugiyono. 2004 Isolation, pra-identification and antibacterial activities of active compounds from liver and liver oil of *Carcharhinus limbatus*.
- Rusmarilin H. 2003. Anticancer activity of alpinia (*Alpinia galanga* (L) Sw) extract
- Astuti, LB. 1997. Extraction of bio-active compounds of seaweed (*Laurencia* sp) and its antifungal activity.
- Lastari DS. 1998. Study on bioactive compounds of garlic on cytotoxic activity of human lymphocyte cells in vitro.
- Ramdhani TH. 2004. Isolation and identification of bioactive compounds of celery in inhibiting xanthin oxidase.



3A-03003H

Traditional drinks

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



3A-03003H

Traditional 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, java-nony
- Mix-spices type: "bir pletok", "cinna-ale", "madai"





Diversity of formula and flavor

The similar-type of functional drink --- formula and flavor are wide ranging from one area to other in Indonesia

Ex: ginger-based drink is known for its variation based on composition, from the simple combination of ginger extract and sugar to richer composition of spices and other ingredients such as coconut milk and milk



Study on Traditional Functional Drink Formulations

- Bir Pletok (mixture of 17 spices and herbs)—traditional drink of Batavia region
Ginger (*Zingiber officinale* R.), cinnamon (*Cinnamomum burmanii* B.), java chili (*Piper retrofractum* V.), sappan wood (*Caesalpinia sappan* L.), lemon grass (*Adropogon citratus*), clove (*Syzygium aromaticum*), cardamon (*Amomum cardamomum* W.), small cardamon (*Elettaria cardamomum* L.), black caraway (*Carum carvi* L.), sweet anise (*Pimpinella anisum*), messoy wood (*Crypearya messoy*), black and white pepper (*Piper nigrum* L.), nutmeg seed and husk (*Myristica fragrans* H.), pandan-leave (*Pandanus amaryllifolius* R.), and star anise (*Illicium verum* H.)(Dulimarta, 2000)
- Madai (mixture of 13 spices and herbs)—based on “rempah ratus” (“jamu” from North Sumatra)
Cinnamon, java turmeric, jinten, black pepper, java tea, “bidara laut”, clove, “lada bolong”, “lada putar”, sappan wood (*Caesalpinia sappan* L.), “cuci atap”, “kayu angin”, star anise (Girsang, 2003)



Jamu

is well-known as traditional functional drinks

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



“Jamu” (Javanese tribe language):
The traditional medicine from plants

Worldwide ??

- Compared to Traditional Chinese Medicine (TCM) ??
- Compared to Japanese Kampo ??
- Compared to Indian Ayuverda ??

Recently developed products

- Ready to drinks
- Complete package
- Soft drink
- Diversification



Recent studies and research communities

- Phytochemical studies (extraction, isolation, and characterization of secondary plant metabolites) have been developed to update
- Biological activity studies have been conducted *in vitro* and *in vivo*, even a few clinical studies are available
- Need coordination & more conducting research directed to the development of medicinal plants;

Ministry of Health, Ministry of Forestry, Ministry of Environment, Ministry of Agriculture, BAPPENAS, BPOM, universities through the related faculties or departments

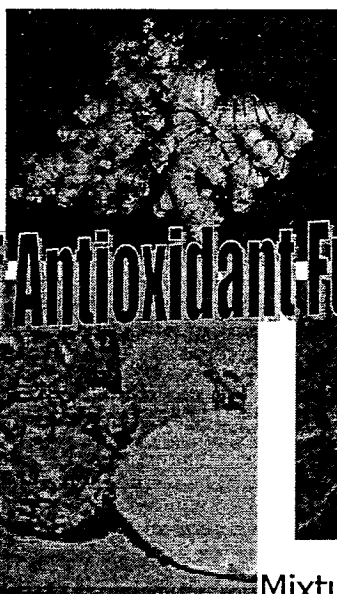
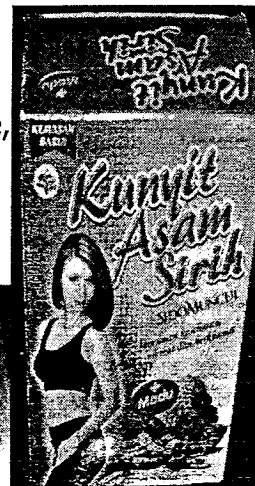
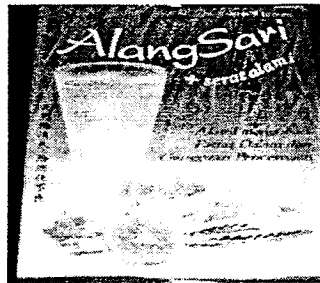
Development of traditional functional drink formulations

“Madu Herbal”

- Honey and
- fennel, garlic, tamarind, “ciplukan”, “belimbing wuluh”, cinnamon, cardamon, nutmeg, tea, piper betle, clove, “daun sendok”, ginger, sweet orange, black caraway, lime, pepper, java noni, etc.
(Suranto,2004)

Formula enrichment

- STMJ-
-ginger tea
- Ylang-ylang tea+
- Tamarind-turmeric-
- “Kuku bima”+



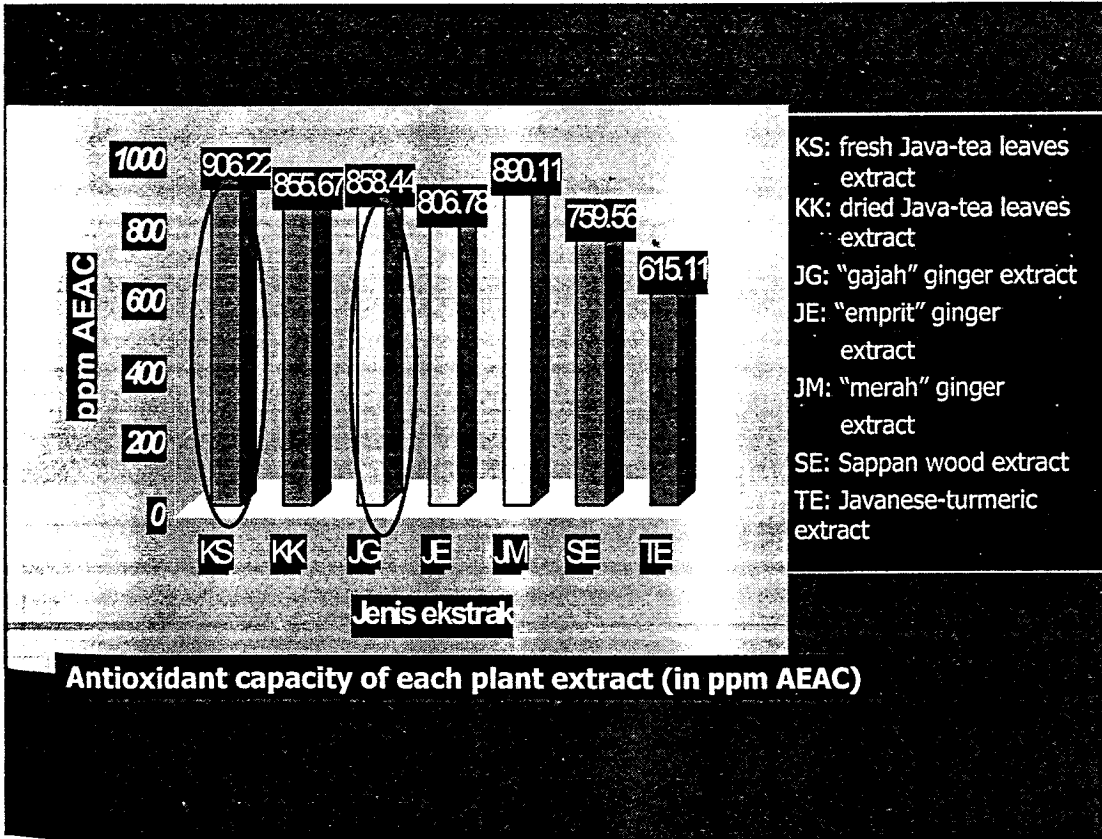
Formulation of Antioxidant Functional Drink

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

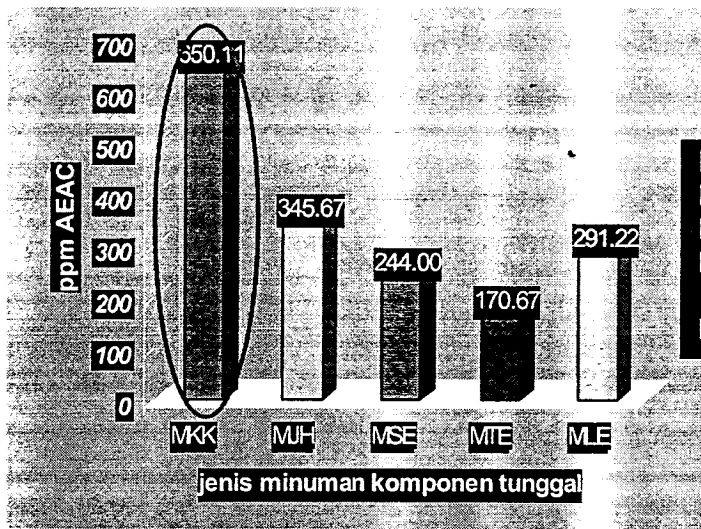
- Sensory evaluation
- Antioxidant activity
- Proximate tests
- Total Polyphenols content
- Total microbes



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

Prof. Yanae talk



MKK: Java-tea drink
MJH: Ginger drink
MSE: Sappan drink
MTE: Javanese-turmeric drink
MLE: Lemon drink

Antioxidant activity of model drink with single plant extract (in ppm AEAC)

Concentration limit of each measurement parameter (based on parameter constraints)

Components (variable)	lower limit (%)	Upper limit (%)
Java-tea extract	10.00	60.00
Ginger tea	15.00	68.00
Sappan wood extract	10.00	60.00
Javanese turmeric extract	2.00	50.00
Lemon extract	10.00	60.00

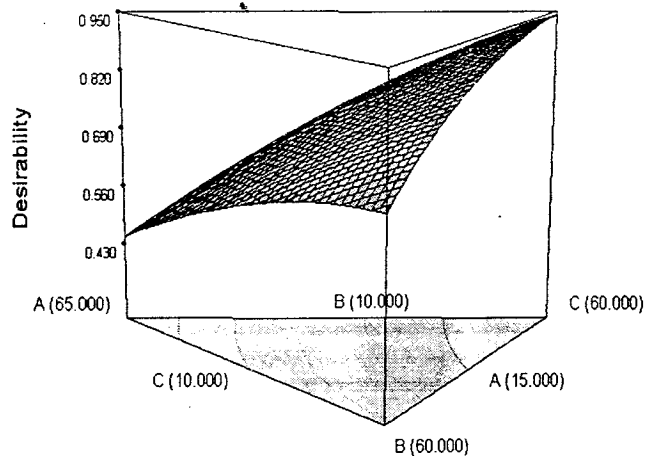
Design-Expert® Software

Desirability



X1 = A: Jahe
 X2 = B: Secang
 X3 = C: Kumis kucing

Actual Components
 D: Temulawak = 2.000
 E: Lemon = 13.000

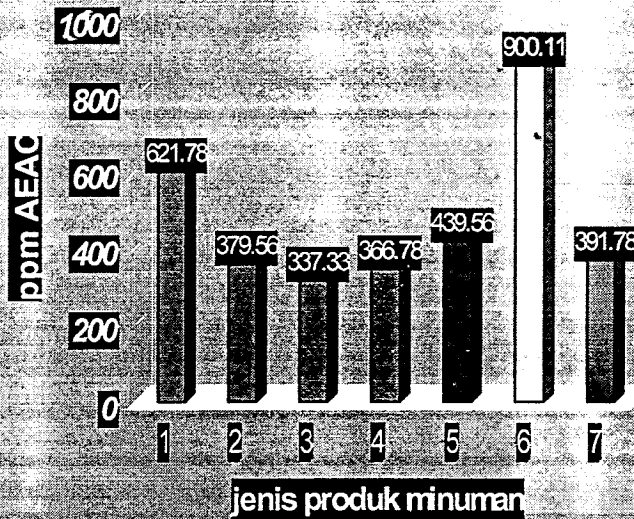
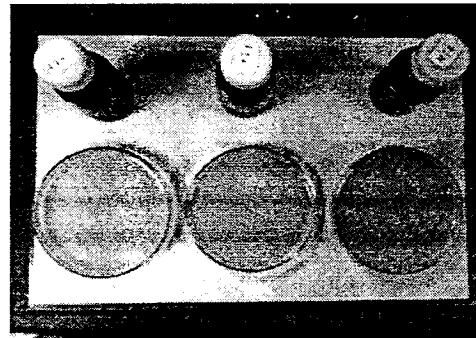


Three selected formulation based on the optimization using *Design-Expert 7.0®* soft-ware

Solutions

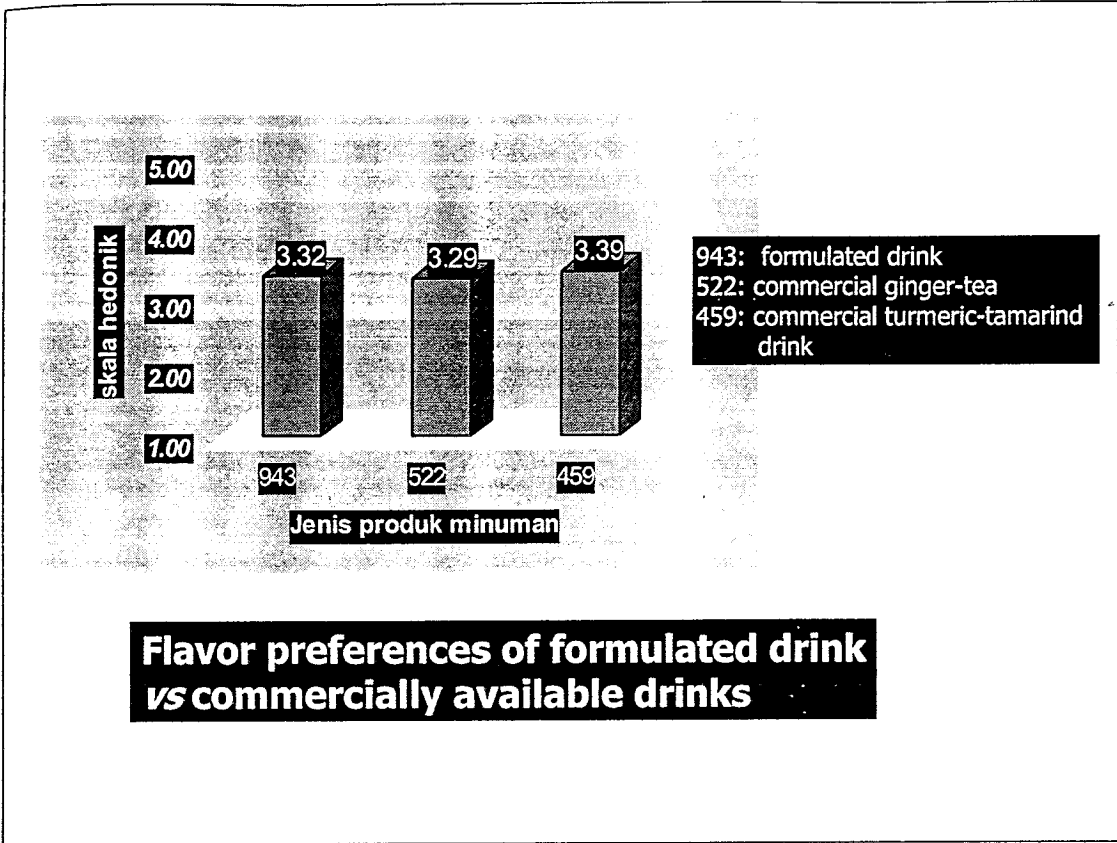
Number	Jaje	Secang Kumis kucing	Temulawak	Lemon	Antioksidan	Citarasa	Desirability
1	15.000	10.000	60.000	2.000	13.000	500.458	0.943
2	15.000	36.500	36.500	2.000	10.000	442.888	0.850
3	42.272	10.000	35.728	2.000	10.000	441.767	0.746

3 Solutions found



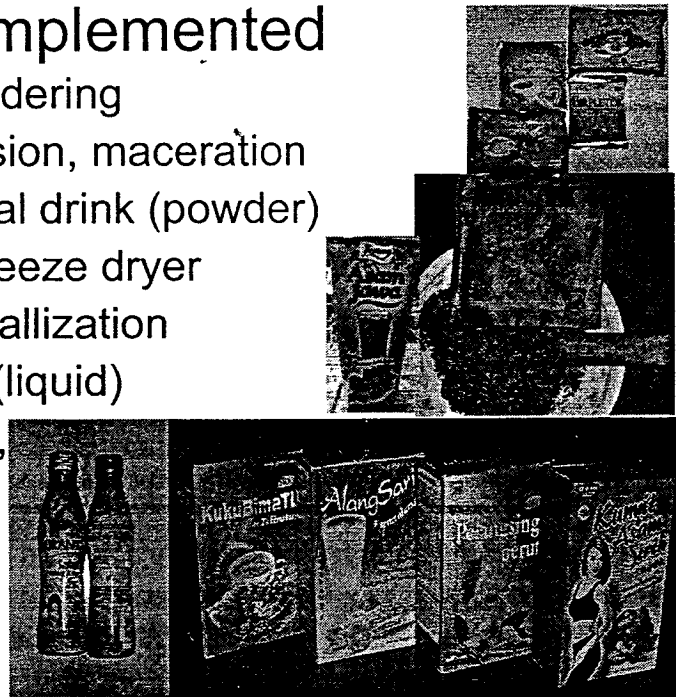
1. 943 Formulated drink
2. Commercial Ginger-tea
3. Commercial Java-turmeric drink
4. Commercial tumeric-tamarind drink
5. Commercial ginger based drink
6. Commercial Vit-C supplement drink with lemon-taste
7. Commercial vit-C enriched soft drink with orange-taste

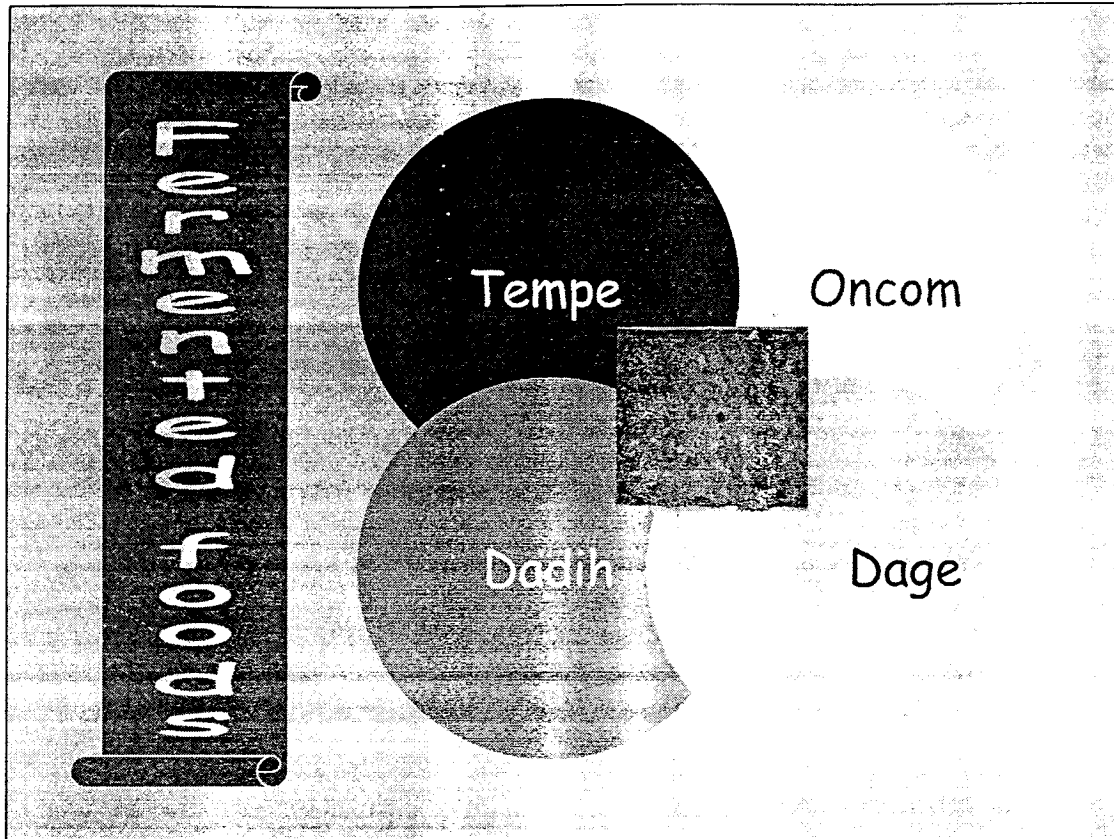
Comparison of the antioxidant capacity of the formulated drink (943) with the commercially available products



Possible technology to be implemented

- Drying and powdering
- Extraction, infusion, maceration
- Instant functional drink (powder)
 - spray dryer, freeze dryer
 - sugar co-crystallization
- Ready to drink (liquid)
 - pasteurization, hot filling, shock cooling
 - sterilization






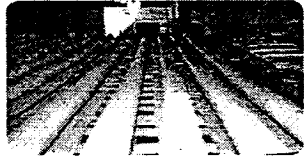
Innovations

Tempe (tempeh)

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



DANE PURNOCANTO, CENTRAL JAVA (PROCESSED)

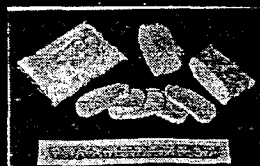


TEMPE DANE PURNOCANTO, CENTRAL JAVA (PROCESSED)

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).

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



Tempe kedele

Known as "tempe" as "tempeh"

• The best quality tempe is made solely from soybean, but lower cost, lower quality tempe may contain young papauw fruits grits, cassava grits (tapioca waste), soybean seedcoats, soy milk or tofu residue (okara)

Fig 1.



Fig.2



FIGURE 2. Tempe kedele distributed in small brown half pounds for the market. (Courtesy R. H. Steinhaus, Cornell University, New York.)



Go International?

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



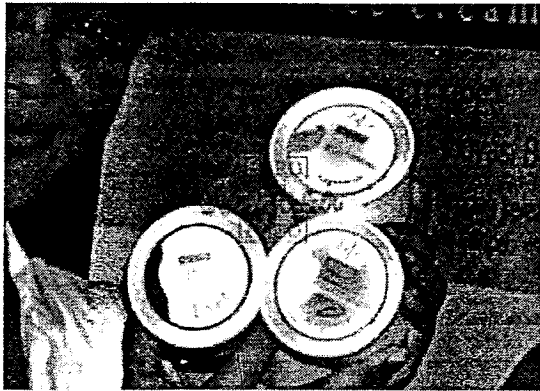
Nutrient Benefits

- All commercial tempes so far examined have contained B12 activity. Tempe made with pure mold under aseptic conditions contain **no** B12 activity. The bacterium responsible has been identified as *Klebsiella pneumoniae* (Curties et al, 1977).
- Fermented soybean had a greater apparent biological value and net protein utilization.
- Tempe has increasing riboflavin, pyridoxine, niacin, vitamin B 12 but lower thiamine.
- Murata (1977) attributed the improved nutritive value of tempe to stabilization of the oil by antioxidants produced during the fermentation and synthesis of B vitamins.
- Soybean phytic acid, which may exacerbate mineral deficiencies in man by hindering absorption in the gut, is reduced by 22% during fermentation. The reduction is attributed to phytase activity in *R. Oligosporus* (Sudarmadji and Markakis, 1977)

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 Isoflavone during tempe fermentation producing daidzein and genistein contributed to the anti-oxidation and anti-angiogenic activities.
- 6,7,4-trihydroxy isoflavone 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*

Newly Listed as 100 Indonesian Innovations



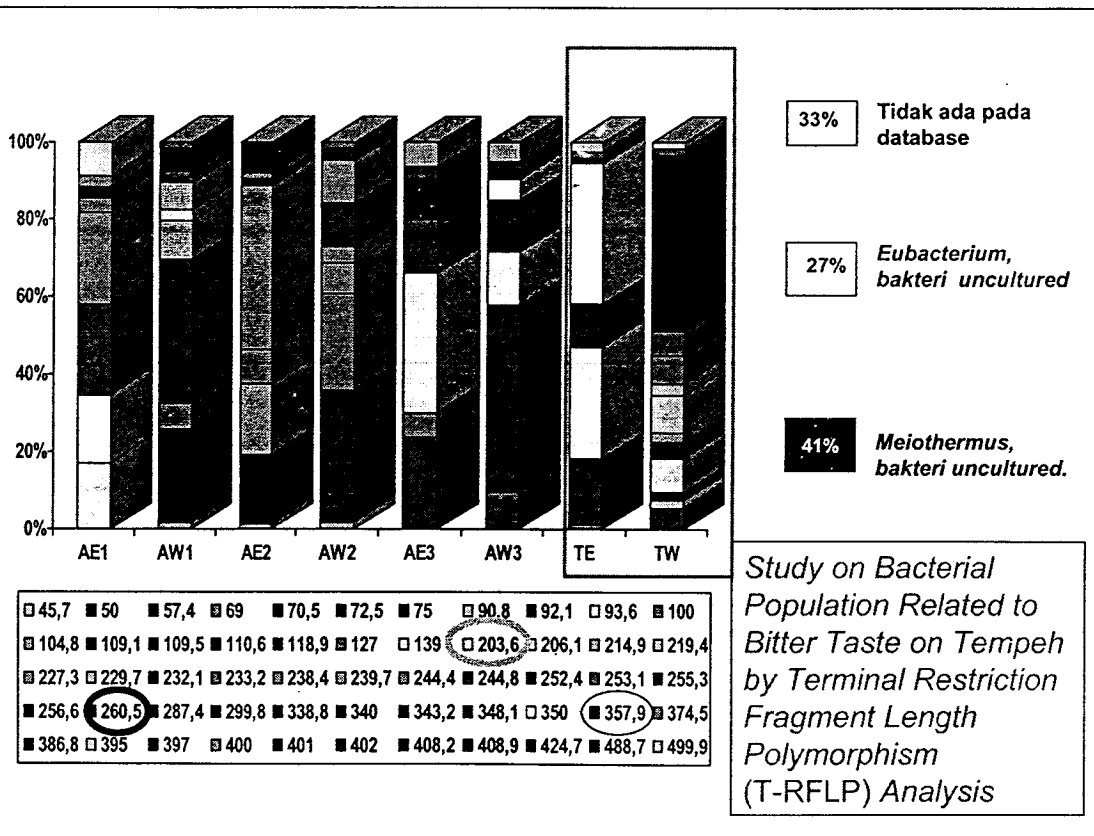
Tempeh Ice Cream

Tempeh Milk Formula for Juvenile

Terdapat 100 inovasi pengolahan pangan yang terdaftar sebagai inovasi terbaru pengolahan 100

No. Inovasi	Nama Inovasi	Kategori	Deskripsi	Manfaat
1	Tempeh Milk Formula for Juvenile	Produk Pangan	Mixing susu, protein, lemak, karbohidrat, vitamin, mineral, dan serat.	Untuk anak-anak dan remaja.
2	Tempeh Ice Cream	Produk Pangan	Ice cream dengan bahan dasar tempeh.	Untuk anak-anak dan remaja.
3	Quick Tempeh	Produk Pangan	Tempeh yang sudah siap pakai.	Untuk anak-anak dan remaja.

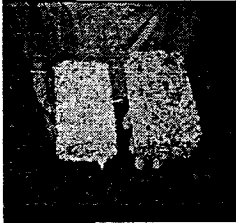
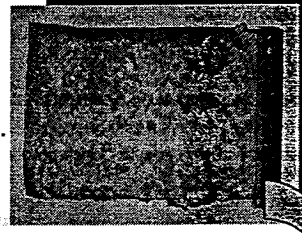
Quick Tempeh





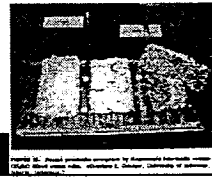
Oncom

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)



Cincau

(West Java's traditional dessert)

A green jelly made from the leaves extract of *Cyclea barbata* L Miers or *Premna oblongifolia* Merr.

Cincau gel has been proven as having a significant immune response, antioxidant and anti-cancer activities. The responsible compounds include carotenoids, chlorophyll and flavonoids



F.R.Zakaria, E. Prangdimurti and D. Nurfaridah (2003)

'Cincau' (West Java's traditional dessert)

-Developing a technology for making instant 'cincau'

- improving gelling capacity
- maintaining physiological activity
- color changes
- extraction effectiveness

-Identification of hydrocolloid fraction and structures

Hygiene and sanitation handling

F.R.Zakaria, E. Prangdimurti and D. Nurfaridah (2003)

'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.

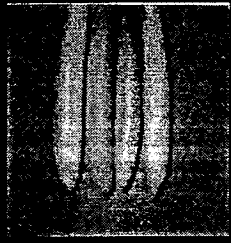


Scientific approval ?

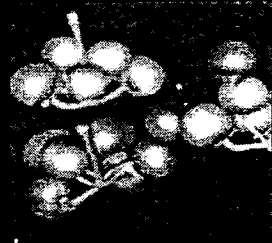
Utilization in functional foods?



Vegetables well-known as lalap in West Java:



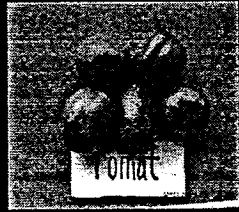
Cucumber
(*Cucumis sativus* L)



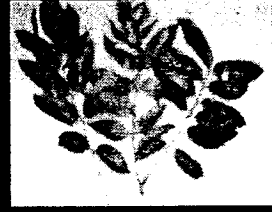
Leunca
(*Solanum nigrum*)



Papaya leaves
(*Carica papaya* L)



Tomato
(*Lycopersium
esculentum* Mill)



Kedondong leaves
(*Spondias cytherea,
Sonn*)



Kemang leaves
(*Mangifera kemanga*)

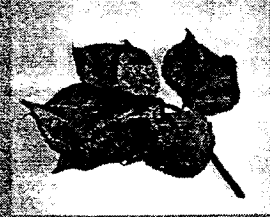
Vegetables well-known as lalap in West Java:



Long bean (*Vigna
sinensis* L. Walp)



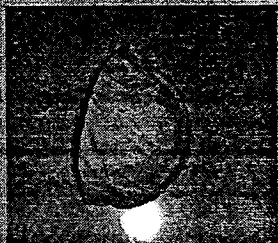
Cassava leaves
(*Manihot esculenta
crantz*)



Pohpohan
(*Pilea trinervia* L)



Kemangi
(*Ocimum americanum* L)



Cabbage
(*Brassica oleraceae
var capitata* L)

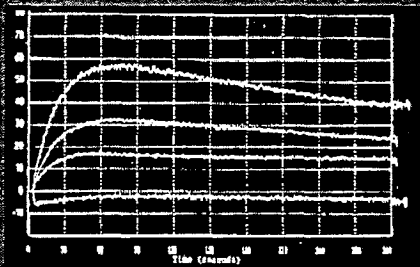


Lettuce
(*Lactuca sativa* L)

MAXIMUM PLATELET AGGREGATION 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
Kemangi leaves	48,2	73,6
Kedondong leaves	63,2	75,5
Papaya leaves	42,3	48,2
Teratai	48,2	73,6
Long bean	64,5	61,4
Cucumber	51,8	50,9
Cassava leaves	51,8	38,6
Cabbage	46,8	44,1

Utilization as functional food ingredients



Extracts of kemang leaves, kedondong leaves and tomato were suitable for jelly products. Addition of extracts up to 8 % into the jelly agar formula were still accepted by panelists. Papaya leaves extract gave unacceptable bitter taste. Natural color jelly with anti platelet aggregation ability?



Picung Seed

Pongium edule Reinw.

Traditionally used as:

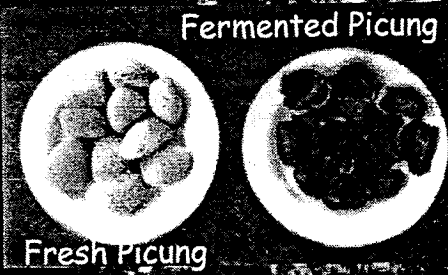
- Spices (fermented picung)
- Black Colorant (fermented picung)
- Preservative for fresh fish
- Anti skin-parasite

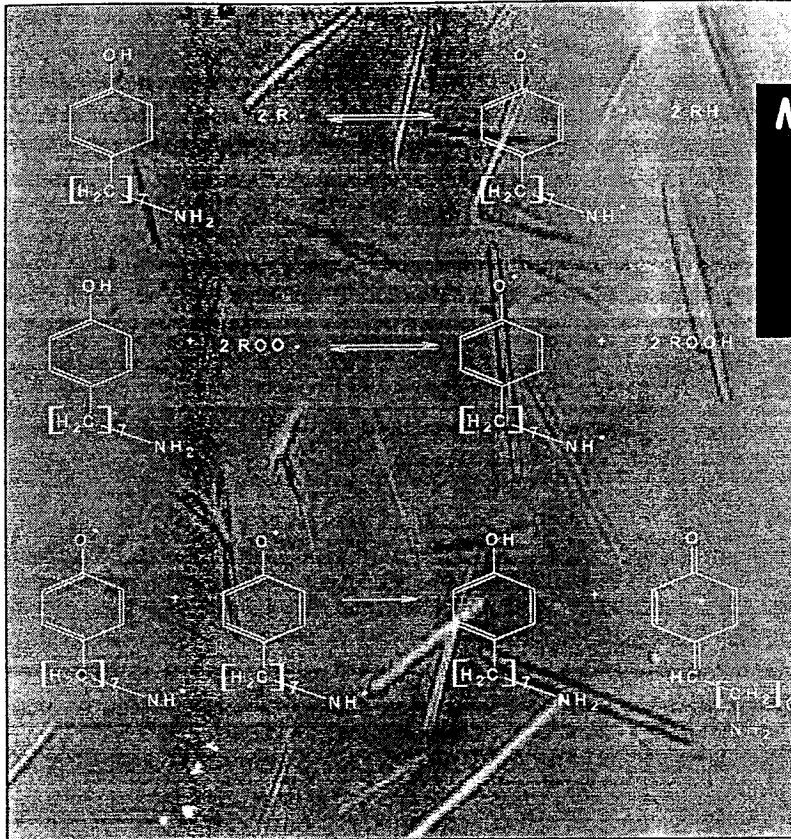


Picung Fruit

Antioxidant in Fermented Picung Seed

- 1-p-hydroxyphenyl-7-aminoheptane
- Methanol Extract
- Conc. 0.01% → higher than BHT
- Needle shape
- White crystal, mp 127°C





Mechanism of Antioxidant Activity of Fermented Picung



Background photo:
Antioxidant
Crystal of
Fermented Picung

Hot topic

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 wangeni (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

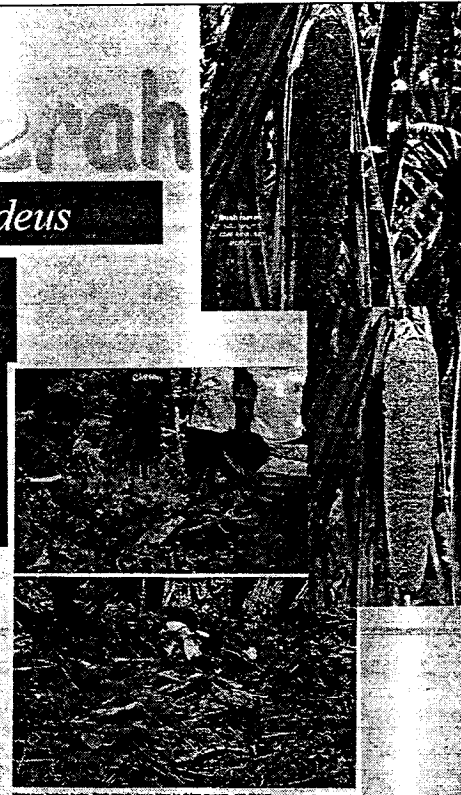


Photo from: H.Machmud Yahya and Benard T. Wahyu Wiryanta



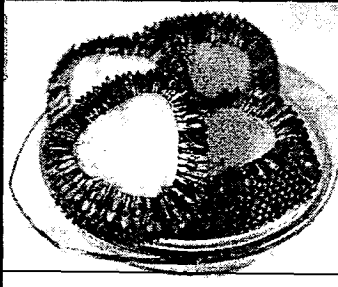
Buah Merah



Tabel 1. Kandungan gizi buah merah

Energy	396 kkal/kg
Protein	3.300 mg
Lemak	26.100 mg
Serat	20.900 mg
Kalsium	54.000 mg
Fosfor	30 mg
Besi	2.44 mg
Vitamin B1	0,90 mg
Vitamin C	25.70 mg
Niasin	1,8 mg
Air	34,90 mg

Sumber: Bonus *Trubus*, 422, XXXVI, Januari 2005



Tabel 2. Kandungan senyawa aktif pada buah merah

Total karotenoid	12.000 ppm
Total tokoferol	11.000 ppm
Betakaroten	700 ppm
Alfa tokoferol	500 ppm
Asam oleat	58 %
Asam linoleat	8.8 %
Asam linolenat	7.8 %
Dekanoat	2.0 %

Sumber: Bonus *Trubus*, 422, XXXVI, Januari 2005

Non-nutritive active compounds?

Source: Khasiat dan manfaat buah merah, Yahya & Wiryanta, 2005

Daging "Sei"



Kosambi Tree

A typical beef jerky, long cut with diameter 2-2.5 cm and smoked by "Kosambi" (*Scheleichera oleasa*, Merr) leave and wood, traditionally produced at Timor, a province of East Nusa Tenggara, Indonesia

Need cooking, no raw consumption



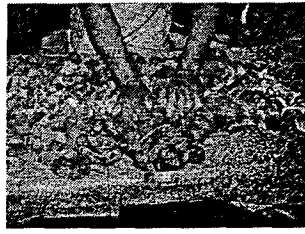
- Quality varied sharply, depend on the producers –no specific parameter or processing guidance
- Local utilization—nationally unknown
- Hygiene and sanitation problem
- Role of kosambi leave and wood?

Daging "Sei"

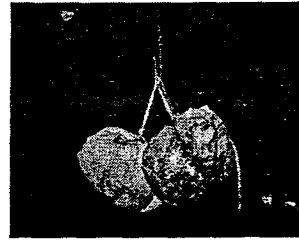
How to produce?



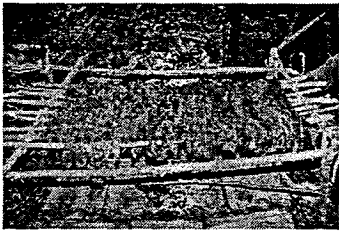
Trimming fresh beef



Addition seasoning and curing salt



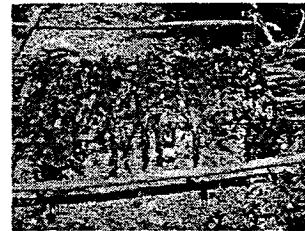
Dripping and fermenting



Setting on the curing and smoking place



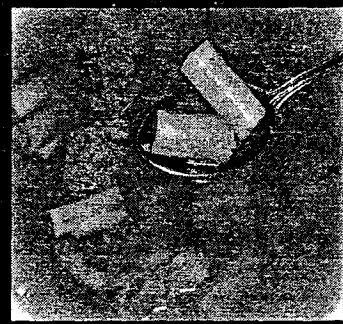
Keeping for 2-3 hrs



Turning over until dried enough

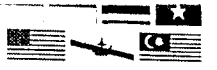
Future challenges

There are many potential tropical food ingredients yet to be discovered. There are many traditional food technologies have not been touched, or even known.



- Animal products
- Marine products
- Local culinary

Urgent study will avoid the loss of verbal information



Acknowledgements::
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TERIMA
KASIH

Thank you