

REPORT

INTERNATIONAL SYMPOSIUM ON PROBIOTIC FROM ASIAN TRADITIONAL FERMENTED FOODS FOR HEALTHY GUT FUNCTION

**Prepared by Dr. Ingrid S Surono
November 2008**

BACKGROUND

The selection of ‘Asian Traditional Fermented Foods’ key words was triggered by the excellent work on the potential health benefits of probiotic derived from *dadih*, one of fermented foods available in Indonesian culture. This work was undertaken by SEAMEO TROPMED RCCN University of Indonesia, in collaboration with the Functional Foods Forum, University of Turku, and Abo Akademi University in Finland, and Institute Pasteur, Lille, France. Findings of this study have raised our attention on the need to preserve and study more on the health benefits of ‘Asian Traditional Fermented Foods’. This type of research is in line with the Center’s main research thrust, ie functional foods. Being the Center of Excellence in Community Nutrition in South-East Asia Region, SEAMEO-TROPMED Regional Center for Community Nutrition (RCCN) is very keen to foster the future research and development of ‘Asian Traditional Fermented Foods’, in facing global challenges in health.

SEAMEO organized the International Symposium on Probiotic in collaboration with International Scientific Association for Probiotic and Prebiotic (ISAPP), co-hosted by United Nations Educational, Scientific and Cultural Organization (UNESCO), and supported by Institute of Life Science (ILSI), Indonesian Society of Lactic Acid Bacteria (ISLAB) as well as industries, Yakult, Danisco and Danone Activia.

OBJECTIVES

The objectives of the International Symposium on Probiotic are two-fold, sharing research experiences and progress in probiotic research among Asian countries, and the second objective is to establish a probiotic research community in Asia.

VENUE AND DATE

The Venue was at Istana Ball room Sari Pan Pacific Hotel, Jakarta. August 19 – 20, 2008.

PROGRAM

Three welcome remarks were addressed from Widjaja Lukito, MD, PhD., Director SEAMEO TROPMED RCCN UI, Prof. Dr. Arief Rachman, Executive Chairman Indonesian National Commission for UNESCO, and Prof. Hubert J. Gijzen, Director and Representative, UNESCO Regional Science Bureau for Asia and The Pacific. The Closing remarks were delivered by Dr. Ingrid S Surono.

There were 9 speakers presenting 10 papers in Plenary Session on the first and second day. Nine resource persons shared their experiences and knowledge in plenary sessions : Prof. Bruno Pot (Institute Pasteur, Lille, Cedex - France), Prof. Harsharn Gill (Werrabee, Victoria, Australia), Prof. Akiyoshi Hosono (Japan Dairy Technical Association, Tokyo-Japan), Prof. Elisabeth Norin (Karolinska Institutet, Stockholm-Sweden), Prof. Yoshimi Benno (Japan Collection of Microorganisms, RIKEN BioResource Center Saitama, Japan), Prof. Lee Yuan Kun (Yang Loo Lin School of Medicine, National University of Singapore), Prof. Subijanto MartoSudarmo (Gastroenterology Division, Department of Child Health Dr. Soetomo Hospital, Medical School Airlangga University), Dr. Ingrid S Surono (SEAMEO TROPMED RCCN Univeresity of Indonesia, Jakarta) and Dr Anang Endaryanto (Medical School, University of Airlangga).

In the parallel sessions, there were 15 oral presentation and 19 poster presentations. The topics represent a comprehensive coverage on probiotics: immune system, gut health, molecular mechanism, cross talk, clinical application, culture independent analysis by molecular identification, kinetics and mechanisms, regulations, the potential indigenous probiotic from Indonesian traditional fermented milk, dadih, decontamination, synbiotic and the understanding on probiotic as strain specific, importance of viability and availability, as well as aged segment specific.

The final program follows:

SEAMEO TROPMED RCCN UI
International Symposium on Probiotic from Asian Traditional Fermented Foods for
Healthy Gut Function
Sari Pan Pacific Hotel, 19 - 20 August 2008
PROGRAM SCHEDULE – Final
Day-1 (August 19, 2008 ISTANA Ball Room)

| Time | Activities | Person in charge |
|---------------|----------------------|--|
| 8.00 - 9.00 | Registration | |
| 9.00 - 9.45 | Opening Ceremony | SEAMEO, UNESCO, UI |
| 9.45 - 10.00 | Coffee Break | |
| 10.00 - 12.30 | Plenary Session I | Moderator : Prof. Dr. Pratiwi Sudarmono |
| 10.00 - 10.30 | Bruno Pot | Can probiotics modulate the immune system? (Prof. Dr. Bruno Pot) |
| 10.30 - 11.00 | Harsharn Gill | Optimisation of gut health using probiotics : rationale and the weight of evidence |
| 11.00 - 11.30 | Subijanto MS | Molecular mechanism of probiotics on mucosal immune response |
| 11.30 - 12.00 | Mimi Tang | Probiotic supplementation for the prevention of allergic disease |
| 12.00 - 12.30 | Agus Firmansyah | Probiotic Evidence for Clinical Application in Children |
| 12.30 - 13.30 | Lunch Break | |
| 13.30 - 14.30 | Panel Discussion | |
| 14.30 - 15.45 | Plenary Session II | Moderator : Prof. Dr. Indrawati Gandjar |
| 14.30 - 15.00 | Akiyoshi Hosono | Health claim regulations of probiotic fermented milk as a functional food in Asian countries/regions |
| 15.00 - 15.30 | Tetty H Sihombing | Regulation of Probiotic foods in Indonesia |
| 15.30 - 15.45 | Coffee Break | |
| 15.45 - 16.15 | Elisabeth Norin | Establishment of intestinal microbiota in children |
| 16.15 - 16.45 | Anang Endaryanto | Immunological Mechanism of Probiotics in Decreasing Allergic Reaction |
| 16.45 | End of day I | |
| 18.30 - 21.30 | Welcome dinner | (By invitation only) |

Day-2 (August 20, 2008, ISTANA Ball Room)

| Time | Activities | Person in charge |
|---------------|---------------------|---|
| 8.00 - 9.00 | Registration | |
| 9.00 - 11.15 | Plenary Session III | |
| 9.00 - 9.30 | Benno | Significance of culture-independent analysis on human intestinal microbiota |
| 9.30 - 10.00 | Lee Yuan Kun | Kinetics and mechanisms of probiotic effects |
| 10.00 - 10.30 | Coffee break | |
| | | Moderator : Prof. Dr. Betty Sri Laksmi Jenie |

| | | | |
|---------------|--|--|-------------------------------------|
| 10.30 - 11.00 | Ingrid S Surono | Potential Dadih Probiotic : Scientific Evidence for Indonesian people | |
| 11.00 - 11.45 | Panel Discussion Lunch Break/Poster viewing | | |
| 11.45 - 13.30 | Paralel session Room I | | Moderator : Prof. Dr. Usman Pato |
| 13.30 - 13.50 | Parungao, Marilen M | <i>In Vitro</i> Study on the Effect of <i>Lactobacillus</i> sp. (4B1) and <i>Lactobacillus</i> sp. (3G3) on Murine Macrophage Nitric Oxide Production and Splenic T-Cell Proliferation | |
| 13.50 - 14.10 | Reza Ranuh | The Role of Probiotics <i>Lactobacillus plantarum</i> IS-10506 and IS-20506 on Intestinal Brush Border Repair | |
| 14.10 - 14.30 | Lilis Nuraida | Probiotic Potency of Lactic Acid Bacteria Isolated From Breast Milk | |
| 14.30 - 14.50 | Fredrik Rieuwpassa | Effect of Fish Protein Concentrate Biscuit with Probiotic as Functional Food on Humoral Immune System and Nutritional Status of Under five-Year Children | |
| 14.50 - 15.10 | Susanti | Immunomodulatory properties of Four <i>Lactobacillus</i> strains isolated from Breast Milk <i>in vitro</i> and <i>in vivo</i> | |
| 15.10 - 15.40 | Coffee break Sonja M.K. | | Moderator : Dr. Koesnandar |
| 15.40 - 16.00 | Nybom | Removal of Cyanobacterial Toxins by Specific Strains of Probiotic Bacteria | |
| 16.00 - 16.20 | Usman Pato | Probiotic properties and <i>in vitro</i> hypocholesterolemic effect of indigenous "tempoyak" lactic acid bacteria for starter cultures | |
| 16.20 - 16.40 | Aulanni'am | Exogenous Formaldehyde Detoxification By Yoghurt Supplementation on | |
| 13.30 - 16.00 | Paralel session Room II | | Moderator : Dr. Anang Endaryanto |
| 13.30 - 13.50 | Betty Dewi Sofiah | The Characteristics of Synbiotic Mung Bean Yogurt at Various Mixed Culture Concentration and Length of Fermentation | |
| 13.50 - 14.10 | NN. Puspawati | Use of Various Cryogenics to Freeze Dry <i>Lactobacillus</i> Isolated From Breast Milk | |
| 14.10 - 14.30 | Lanjar Sumarno | Ability of <i>Lactobacillus plantarum</i> in lowering Cholesterol <i>in vivo</i> | |
| 14.30 - 14.50 | Marilen M. Parungao | The Effects of Orally-Administered <i>Lactobacillus</i> sp. 4B1 on the Adipose Tissue of Diet-Induced Obese Mice (<i>Mus musculus</i> L.) | |
| 14.50 - 15.20 | Coffee break Anggraeini | | Moderator : Dr. Siti Muslimatun |
| 15.20 - 15.40 | Puspitasari | Displacement and inhibition of <i>Bacteroides vulgatus</i> by Probiotic Bacteria | |
| 15.40 - 16.00 | Sasanti T. Darijanto | Improvement of gastric survivability of probiotic bacteria by microencapsulation | |
| 16.00 - 16.20 | Judiono | Effect of plain kefir supplementation on glucose blood reduction in hyperglycemia Wistar rats induced by alloxan | |
| 16.40 - 17.00 | | Closing Ceremony/Awarding Certificate of Attendance | |

There were 42 abstracts submitted and being reviewed by Scientific committee (Prof. Betty Sri Laksmi Jenie, MS, Dr. Ingrid S Surono, Dr. Anang Endaryanto, MD, SpA (K) and Dr. Ir. Siti Muslimatun): 8 abstracts were rejected, and 15 papers were

accepted for oral presentation in parallel sessions on the second day. Poster presentations included 19 papers. The list of posters follows :

Poster Presentation :

Characterization of *Lactobacillus pentosus* as a potential strain for producing L-lactic acid from biomass
P.S. Wulandari and B. Saksono

Characterization of Methanol Dehydrogenase of Pink Pigmented Facultative Methylophilic Bacteria Isolated from Indonesian Salad
Vivitri D. Prasasty and Diana E Waturangi

Gel Forming Component of Green Cincau leaves (*Premna oblongifolia* Merr.) Induced Short-Chain Fatty Acid Production in the Rat Dygesta
Samsu Udayana Nurdin

Effect of Adding Lactic Acid Bacteria Inoculum and Full Cream Milk on Fermented Mung Beans (*Phaseolus radiatus* L.) Concentrate as Functional Savory
Agustine Susilowati, Aspiyanto, and Yati Maryati

Probiotic Properties of Lactobacilli isolated From Sumbawa Mare Milk
I N.Sujaya N.M.U. Dwipayanti, N.L.P. Suariani, N.P. Widarini, N.W. Nursini , K. A. Nociantri and Y. Ramona

Potential use of Reverse Osmosis Membrane For Concentrating Lactic Acid Bacteria Fermented Mung Bean (*Phaseolus radiatus* L.) as Functional Savory
Aspiyanto and Agustine Susilowati

Viability of Yogurt Starter Bacteria During The Production of Ice Cream
Masdiana Padaga and M.E.Sawitri

Characterization of Probiotic Properties Towards Twenty Isolate Strains of Indigenous Lactic Acid Bacteria for Health Food Application
Ida Susanti, Retno W. Karnadi, Fatim Illaningtyas and R.D. Esti Widjayanti

Effect of Milk Enriched by “Dadih” Probiotic *Enterococcus faecium* IS-27526 (MEDP) on the IgA of the Elderly
Rusilanti, Clara M. Kusharto, Ingrid S Surono, Alsuhendra, Ridawati and Ani

Lactobacillus plantarum Strain IS-10506 and IS-20506 up regulated TLR 4 and but not TLR2 in overexpressed HSP-70 Intestinal Ephemeral cells of *Rattus norvegicus* induced by LPS
Wibi Riawan, Titis Sari Kusuma, I Gusti Made Reza Gunadi Ranuh and Ingrid S. Surono

The abilities of *Lactobacillus plantarum* Strain IS-10506 and IS-20506 in inhibiting NFκB activation, down regulating TNF Receptor-1 (TNF-R1) and Apoptosis in Epithelial Intestinal's Brush Border of *Rattus norvegicus* induced LPS
Titisi Sari Kusuma, Wibi Riawan, I Gusti Made Reza Gunadi Ranuh and Ingrid S. Surono

Technology and Product Development of Biomass as Functional Natural Protein and Prebiotic Substance
R. Hromádka, E. Tomasova, M. Jelinek, M. Beran and L. Adámek

Cloning of gene *D – ldh* from *L. plantarum* to develop its mutant for producing Highly purified L-lactic acid
B. Saksono, P.S. Wulandari, E. Yetti, L. Triratna, G.A. Wibowo, D. Fitriani, D. Setyo Rini and M. Gozan

Intestinal Metabolism of Cholesterol in Children with Cows-milk Allergy
Agneta Uusijärvi, Anna-Karin Persson, Christine Edwards and Elisabeth Norin

Antagonism Properties of Indigenous Probiotic Isolated from Traditional Fermented Foods Against Diarrhoeal Pathogens
Lily Arsanti Lestari, Abu Tholib A and Endang S. Rahayu

Concentration of Mung Beans (*Phaseolus radiatus* L.) vegetable broth as Functional Savory Flavor by Ultrafiltration membrane
Agustine Susilowati, Aspiyanto, Hakiki Melanie and Yati Maryati

Probiotic Reduce Incidence and Duration of Respiratory Tract Infections in Children
Arthur C. Ouwehand, Didier Carcano, Shuguang Li, Anders Henriksson, Greg Leyer

Synbiotic effect of Prebiotic (*Dahlia pinnata* Cav Tubers) and *Lactic Acid Bacteria* (LAB) by DFM (*Direct Fed Microbial*) on Nutrient Digestibility of Poultry Feed
Dadik Pantaya and Suci Wulandari

Utilization of Honey as Prebiotics
Rusfidra and Endang Purwati

The two-day symposium indeed has been a probiotic community, and it fulfilled UNESCO expectation to promote and demonstrate through its Science programmes, to preserve biodiversities and expect science can be applied to real-world problems such as community health and nutrition, and can be an effective instrument in helping countries achieve their Millennium Development Goals.

On the first day of symposium, August 19, 2008 at 18.30 – 21.00, there was a cultural performance, of Angklung from Mang Ujo group, Bandung, and traditional dances (Saman - Aceh and Bali) performed by Student from Faculty of Medicine, Trisakti University. Welcome dinner was attended by host, speakers, and international participants; 50 persons were present.

PARTICIPANTS

197 participants from 13 countries attended the Symposium. They were from France, Australia, Japan, Singapore, Sweden, Finland, The Philippine, China, Chez Republic, Thailand, Malaysia, India and Indonesia. Student participants at the undergraduate level received a 50 % discount on registration fees. Those whose abstracts were accepted received a waived registration fee. List of participants is enclosed.

Profiles of the participants are as follow:

| | |
|-------------------------------|------|
| Resource persons | : 9 |
| By invitation | : 31 |
| Domestic Student | : 27 |
| Domestic government employee | : 33 |
| Domestic Industry | : 36 |
| Domestic professional/private | : 41 |
| International Student | : 2 |
| International professional | : 11 |
| International Industry | : 7 |

FUNDING SOURCE

a. Professional Organization:

- i. ISAPP financed 5,000 USD
- ii. ILSI financed 1,500 USD
- iii. UNESCO has financed 10,000 USD, and upon submitting report UNESCO will add other 500 – 1,000 USD

b. Industry:

- i. Yakult Indonesia Persada supported 10,000 USD, as Platinum Sponsor
- ii. Danisco Singapore supported 2,000 USD, as Silver Sponsor
- iii. Danone Activia supported Rp. 10,000,000

c. Participants

Profiles of the participants attending the Symposium are categorized by different registration fee as follow:

| | |
|-------------------------------|--|
| Domestic Students | : two students are waived, abstract accepted Others (25 students) discounted 50 % |
| Domestic Student | : 27 |
| Domestic government employee | : 33 |
| Domestic Industry | : 36 |
| Domestic professional/private | : 41 |
| International Student | : 2 |
| International professional | : 11 |
| International Industry | : 7 |

Speaker from Australia Prof. Harsarn Gill and from France Prof Bruno Pot have travel support at 1,000 USD each from ISAPP as they are ISAPP representatives. The Organizer supported the travel for Prof. Lee Yuan Kun from NUS Singapore, returned airline ticket Singapore-Jakarta-Singapore. Likewise, Speaker from Airlangga University, Prof Subiyanto Martosudarmo and DR. Anang Endaryanto the airline ticket were supported by the organizer. The other speakers come by their own budget. In return, we provide airport transfer, accommodation and meals during the program and bring them (Prof Elisabeth Norin, Prof. Akiyoshi Hosono and Prof. Yoshimi Benno to a trip surrounding Bogor – Bandung after the program.

SUMMARY OF DISCUSSION

Three probiotic strains isolated from Indonesian traditional fermented buffalo milk, dadih, *L. plantarum* IS-10506, *L. plantarum* IS-20506 and *E. faecium* IS-27526 had been discussed in plenary and parallel sessions. *L. plantarum* IS-10506 has high viability in fecal samples of animal model and of adult living with HIV, immuno modulatory properties *in vivo*, using Sprague Dawley rats, suppressed allergy by establishing new balance of Th1/Th2 in mouse model of Balb/c mice, increase CD4+ counts in a pilot study on adults living with HIV. *L. plantarum* IS-10506 and IS-20506 showed significant repair of brush border epithelial of Wistar rats induced by LPS *E. coli*. *L. plantarum* IS-10506 also showed ability in decontaminating cyanobacterial toxin, microcystin-LR *in vitro*. Molecular mechanism, cross talk and clinical application had been validated, and culture independent analysis by molecular identification of human fecal microbiota had been assessed.

Other candidates of probiotic from Asian fermented food were also discussed. The lactic acid bacteria from traditional fermented balo-balo of the Philippine has good properties in reducing body weight of obese mice. Validating the understanding on probiotic term had been discussed. Probiotic is strain specific which needs to have an establish identity especially clear information on Genus, species and strain should be identified by culture independent technique PCR and define sequences of total chromosomes, and should be deposited in international culture collection, availability should be confirmed, likewise, viability with minimum viable numbers of the probiotic at the end of the shelf life at defined storage condition, $10^6 - 10^8$ cfu/g (FAO, WHO, 2001). Appropriate methods for detecting and quantitating the probiotic in foods should be standardized.

The safety, efficacy and doses should be proven to specific target population (age, health condition) by randomized placebo controlled trial in human studies to South East Asian people, priority to Indonesian people with validated scientific methods to give reproducible and credible data from different laboratories.

Documentation of safety include history of safe use, animal and human data, any infectivity/toxicity, prevent strain with producing D-lactate which may lead to acidosis, no hemolytic potential, no transferable antibiotic resistance, unique strains within a species are tested for their resistance levels.

Safety standards differ depending on the category of the product (substance, how it is administered, intended use), final product description/specifications, end use category of probiotic food such as use in generally healthy populations, use in healthy populations with special situations, newborns, pregnant or lactating women or use in diseased populations.

As probiotic food, food matrices play important role on physiological function, avoid a situation where nutrition or health claims mask the overall nutritional status of a food product, which could mislead consumers when trying to make healthy choices in the context of a balanced diet.

From the producer point of view, probiotic food should provide information about manufacturing process, details on fermentation medium or food matrix, genetic stability of microbe over multiple propagations, reachable customer service to get detailed

information, and the Quality Assurance department should practise recognized and standardised methods of analyses for availability, viability and safety. Producers should provide suggested serving size to be consumed in relation with the health claim and storage conditions, as many probiotic products presently on the market do not meet these criteria.

NEXT PLAN

To follow up this event, we plan to organize a Workshop on Probiotic by next year around October, and the next International Symposium on Probiotic is planned to be in 2010.

We also wish to do international collaboration with probiotic experts from France, Australia, Sweden, Japan and Singapore.

OTHERS

Certificate of Attendance

The Certificate of Attendance was signed by Widjaja Lukito, MD, PhD, Director SEAMEO TROP MED RCCN UI, Prof. Dr Bruno Pot, ISAPP Representative, and Prof. Hubert J. Gijzen, Director and Representative, UNESCO Regional Science Bureau for Asia and The Pacific.