目錄

2011 米食加工與營養國際研討會
-由主食到保健-
International Symposium on Processing and Nutrition of Rice Products
- From Staple Food to Nutraceutical

壹、主題：

米食是世界大部份人口的主食。稻米是人類重要的能量與營養來源，也具有許多功能性質。為便於烹煮與消化，稻米常以精白米食用。但由稻穀豐富的營養觀點，米食可以成為保健食品的基質。使人們食用主食就可以達到保健的效果。本研討會的目的是邀請國內外專家學者討論選擇適當的加工方法使米食由主食提昇具有保健功能。

貳、指導單位：行政院農業委員會農糧署

參、主辦單位：國立宜蘭大學

肆、承辦單位：國立宜蘭大學食品科學系與食品創意與教育發展中心

伍、協辦單位：臺灣食品科學技術學會、臺灣保健食品學會、臺灣農業化學會、臺灣營養學會

陸、日期：中華民國100年9月23日(星期五)

柒、地點：國立宜蘭大學生資大樓1樓國際會議廳（宜蘭縣宜蘭市神農路一段1號）

捌、講者：

1. Dr. Melissa Fitzgerald：國際稻米研究所稻穀品質營養及採後中心主任(GQNPC, IRRI)、國際稻米品質網(INQR)主席
2. Dr. Kim Anh Hoang：越南西貢科技大學，食品技術學院副院長(Saigon Technology University. Vice Dean of Food Technology Faculty)
3. Dr. Ling-Ling Yang：楊玲玲教授，臺北醫學大學藥學系教授、教育部醫學教育委員會委員。
4. Dr. Onanong Naivikul：泰國農業大學，食品科學與技術系榮譽教授(Kasetsart University,

Department of Food Science and Technology)

玖、主持人：

1. 盧訓所長(Dr. Shin Lu)：中華穀類食品工業技術研究所所長(China Grain Products R&D Institute, Director)。
2. 張永和研發長(Dr. Yung-Ho Chang)：靜宜大學研發長(Providence University, Dean of research and development)。

2011米食加工與營養國際研討會日程表

Time	Content	Speaker	Host
09:30 | 10:00	報到 Registration		
10:00 | 10:05	歡迎 Welcome and Introduction	趙涵捷校長(宜蘭大學) President of National Ilan University	
10:05 | 10:10	開幕 Opening	林榮信院長(生物資源學院) Dean of College of Bioresource	
10:10 | 11:00	**運用新科技分析米食的營養** (Embracing new technology to determine nutritional compounds in rice)	Dr. Melissa Fitzgerald, IRRI	盧訓所長 Dr. Shin Lu. Director, 中華穀物研究所 China Grain Products Research & Development Institute, Taiwan
11:00 | 11:10	討論 Discussion		
11:10 | 12:00	**越南米食加工與米製品之發展現況** (Overview of rice processing and products in Vietnam)	Dr. Kim Anh Hoang, Vietnam	
12:00 | 12:10	討論 Discussion		
12:10 | 13:30	午餐休息 Lunch		
13:30 | 14:20	**泰國米食加工與米製品之發展現況** (Overview of rice processing and products in Thailand)	Dr. Onanong Naivikul, Thailand	張永和研發長 Dr. Yung-Ho Chang Distinguished Professor 靜宜大學 Dean of R and D Providence University Taichung, Taiwan
14:20 | 14:30	討論 Discussion		
14:30 | 15:20	**米食：由主食到保健** (Rice : from staple food to nutraceuticals)	楊玲玲教授 中國醫藥大學附設醫院副院長 (Dr. Ling-Ling Yang, Taiwan)	
15:20 | 15:30	討論 Discussion		
15:30 | 16:00	總結及閉幕 Final Discussion and Conclusion		

講者簡介

Dr. Melissa Fitzgerald

PERSONAL DETAILS

NAME	Melissa Anne FITZGERALD
PLACE OF BIRTH	Sydney, Australia
NATIONALITY	Australian
CURRENT ADDRESS	Grain Quality, Nutrition and Postharvest Centre International Rice Research Institute (IRRI) DAPO 7777 Metro Manila Philippines Ph: 632 580 5600 extn 2755 Mob: +63 917 545 3035 Email: m.fitzgerald@irri.org

ACADEMIC ACHIEVEMENTS

QUALIFICATIONS	PhD June 1997, La Trobe University, Victoria Australia B.Sc. Hons 1990, University of Sydney, Australia
AWARDS AND DISTINCTIONS	NSWDPI Staff Award 2001 Excellence in Agriculture Nancy Millis Award 1993 Excellence in Agriculture Eva Saunders Memorial Award 1989 Excellence in Plant Physiology

FROM JANUARY 16 2011

Australian Food and Grocery Council Chair, School of Agriculture and Food Sciences, University of Queensland.

Research: I will be establishing a metabolomic profiling platform for volatile compounds and primary and secondary polar and non-polar metabolites for food flavour, fragrance, nutritional value, and medical impact, and searching for candidate genes for these compounds. Researhc products will be delivered to breeding programs and food manufacturers.

Teaching: Improving the quality of food science graduates in Australia through new undergraduate and postgraduate strategies.

EMPLOYMENT HISTORY

APRIL 2007 – DECEMBER 31 2010

Head, Grain Quality, Nutrition and Postharvest Centre (GQNPC), International Rice Research Institute (IRRI), Philippines. Global Leader Theme 4 Global Rice Science Partnership (GRiSP).

APRIL 2004 – MARCH 2007

Principal Research Scientist, Rice Improvement Program, NSW Department of Primary Industries, Australia, but seconded from NSWDPI to IRRI as Head of the Grain Quality and Nutrition Research Centre.

April 1997 – March 2004

Head of chemistry and quality in the Rice Improvement Program, NSW Department of Primary Industries, Australia.
Research Scientist (1998 – 1999)
Senior Research Scientist (2000 – 2004)

January 1994 – March 1997:

PhD student, School of Botany, La Trobe University with Dr John Anderson and at Tatura Agricultural Institute, Agriculture Victoria with Dr David Ugalde.

January 1991 – December 1993:

Research Assistant, School of Botany, University of Melbourne with Dr Malcolm Calder and Prof. Bruce Knox.

Current Interests

My current research interests lie with understanding the basis of flavour, taste, sensory and nutritional value of foods from genetic, structural, rheological, functional and medical perspectives. My interest in metabolites, how these affect taste and flavour, and the potential nutritional/medical value of different metabolites in food has been growing over the past few years. The discipline has now reached the stage where metabolite data can be developed into phenotyping tools for associating with genotype maps of segregating populations. As genotying technology improves, it is becoming increasingly possible to find candidate genes for the chemistry of food flavour, fragrance and nutrition.

I am interested in developing an exciting research program that attracts good quality food geneticists, chemists, engineers and biochemists, and provides collaborative opportunities with social scientists, medical professionals, nutritionists and molecular biologists, and further down the application pathway, with different members along value chains for cereals, fruit and vegetables, and their products.

Professional Memberships and Affiliations

Chair, International Network for Quality Rice inqr.irri.org
Member, AACC International and Chair of Rice Methods Committee.
Liaison Member ISO TC34/SC4
Adjuct Professor: Departments of Human Ecology, Molecular Biology and Biochemistry, and Chemistry at the University of the Philippines, Los Baños, and on the Graduate Committee.
Member RACI Chemistry Division

PUBLICATIONS 2009 - CURRENT

1. Boualaphanh, C.; Calingacion, M.; Daygon, D.; Moing, A.; Mumm, R.; Hesselhof Hansen, T.; Erban, A.; Allwood, W.; Ward, J.; Kofod Schoerring, J.; Hall, R.; Fitzgerald, M., A metabolomics approach to identify new traits of rice quality in traditional and improved varieties of Laos. Metabolomics **submitted**.

2.Butardo, V., Fitzgerald, M., Bird, A., Gidley, M., Flanagan, B., Larroque, O., et al. **2011**. Impact of Down-regulation of Starch Branching Enzyme IIb in Rice by Artificial microRNA and Hairpin-RNA-Mediated RNA Silencing. *Journal of Experimental Botany*, doi:doi: 10.1093/jxb/err188.

3.Tran, N., A; Daygon, V., D; Resurreccion, A.; Cuevas, R., P,; Corpuz, H.; Fitzgerald, M. A. **2011**. A single nucleotide polymorphism on the Waxy gene explains gel consistency.. *Theoretical & Applied Genetics 123: 519-25*. DOI: 10.1007/s00122-011-1604-x

4. Boualaphanh, C., Daygon, V., Calingacion, M., Sanitchon, J., Jothityangkoon, D., Mumm, R., Hall, R., Fitzgerald, M. **2011**. Use of new generation SNP genotyping for rapid development of near-isogenic lines in rice. *Crop Science* **51**.

5. Boualaphanh, C.; Calingacion, M.; Jothityangkoon, D.; Sanitchon, J.; Cuevas, R.; Fitzgerald, M. **2011**. Yield and quality of non-aromatic and aromatic Lao rice in response to nitrogen fertilizer *Science Asia* **37:** 89-97

6. Champagne, E. T.; Bett-Garber, K. L.; Fitzgerald, M. A.; Grimm, C.; Lea, J.; Ohtsubo, K.; Jongdee, S.; Xie, L.; Bassinello, P.; Resurreccion, A. P.; Ahmad, R.; Habibi, F.; Reinke, R. **2010,** Important Sensory Properties Differentiating Premium Rice Varieties. *Rice,* 270-281.

7. Cuevas, R. P.; Daygon, V. D.; Morell, M. K.; Gilbert, R. G.; Fitzgerald, M. A. **2010** Using chain-length distributions to diagnose genetic diversity in starch biosynthesis. *Carbohydrate Polymers*, 81, 120 - 127.

8. Cuevas, R.; Fitzgerald, M. A.; Gilbert, R. G., Structural differences between hot-water-soluble and hot-water insoluble fractions of starch in waxy rice (Oryza sativa L.). *Carbohydrate Polymers* **2010,** 81, 524 - 532.

9. Cuevas, R.; Daygon, V.; Corpuz, H.; Waters, D. L. E.; Reinke, R. F.; Fitzgerald, M. A. **2010.** Melting the Secrets of Gelatinisation Temperature. *Functional Plant Biology*, 37, 439 - 447.

10. Kovach, M. J.; Calingacion, M.; Fitzgerald, M. A.; McCouch, S. R. **2009.** The origin and evolution of fragrance in rice (*Oryza sativa* L.). *Proceedings of the National Academy of Science*, 106, (34), 14444-14449.

11. Fitzgerald, M. A.; Resurreccion, A. P. **2009** Maintaining the yield of edible rice in a warming world. *Functional Plant Biology*, 36, (12), 1037 - 1045.

12. Fitzgerald, M. A.; McCouch, S. R.; Hall, R. D. **2009.** More than just a grain of rice, the global quest for quality. *Trends in Plant Science*, 14, (3), 133-139.

13. Fitzgerald, M. A.; Bergman, C. J.; Resurreccion, A. P.; Möller, J.; Jimenez, R.; Reinke, R. F.; Martin, M.; Blanco, P.; Molina, F.; Chen, M. H.; Kuri, V.; Romero, M. V.; Habibi, F.; Umemoto, T.; Jongdee, S.; Graterol, E.; Reddy, R.; Zaczuk Bassinello, P.; Sivakami, R.; Shoba Rani, N.; Das, S.; Wang, Y. J.; Indrasari, S. D.; Ramli, A.; Rauf, A.; Dipti, S. S.; Xie, L. H.; Thi Lang, N.; Singh, P.; Castillo Toro, D.; Tavasoli, F.; Mestres, C. **2009.** Addressing the dilemmas of measuring amylose in rice. *Cereal Chemistry*, 86, (5), 492-498.

14. Champagne, E. T.; Bett-Garber, K. L.; Thomson, J. L. **2009.** Fitzgerald, M. A., Unraveling the Impact of Nitrogen Nutrition on Cooked Rice Flavor and Texture. *Cereal Chemistry*, 86, (3), 274-280.

演講摘要

運用新科技分析米食的營養

Embracing new technology to determine nutritional compounds in rice

Healthy Compounds in Rice

Melissa Fitzgerald

Since quality evaluation of rice began, the quest for understanding more about the sensory experience as well as the nutritional benefits of rice has continued. Much anecdotal evidence exists about the nutritional benefit of particular rice varieties, but research so far has not revealed the basis for the claims. The technology growth seen this century has led to the beginnings of a new ability to identify compounds present in rice grains, that could lead to nutrition, health and well-being. Moreover, the spectacular progress in genome-wide genotyping provides new opportunities to find genes that underscore the synthesis of such newly identified compounds. The present paper will focus on such new tools, and their potential, and show how these new tools are now leading to new knowledge about the components of a rice grain and how those components can affect health.

Note

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講者簡介

Dr. Kim Anh Hoang

Name: **Kim Anh Hoang, Ms.**
Title: **PhD**
Date of birth: **September 11, 1972**
Nationality: **Vietnamese**
Civil Status: **Married, 2 children**
Address: **27/1 Vo Thi Sau Street, Dist. 1, Hochiminh City**
Office: **1 Mac Dinh Chi Street, Dist. 1, Hochiminh City**
Tel/Fax: **84.8.8241401, 84.8.8241346**
Email: **hoangkimanh@hcm.vnn.vn**
kimanhh@gmail.com

Education/Professional Studies:

1995: Diploma of Engineering (Food Biotechnology)
Moscow National Academy of Food Industry, Russia

1999: Certificate, Institute of Molecular Biology, Kiev - Ukraine

2001: Certificate, Institute of Biotechnology Research (GBF), Braunschwein - Germany

2003: Dr. Eng. (Food Technology), Technology University of Hochiminh City

Language Skills:

English: Advanced

Russian: Fluent

German: Basic

Vietnamese: Mother tongue

Employment:

Since 1996: Institute of Tropical Biology, Vietnamese Academy of Science and Technology
Researcher, Head of Department, Project Manager

Since 2004: Saigon Technology University. Vice Dean of Food Technology Faculty

Membership of Professional Bodies:

- Executive Member of South Branch, Vietnam Association of Food Science and Technology (VAFoST)
- Member of Hochiminh City Association of Biology.

Professional Experience Record:

Academy:

- Undergraduate and postgraduate lecturer on Food Chemistry and Biochemistry, Food Biotechnology, Carbohydrate Engineering, New Product Development.
- Organizer of Food Technology training courses and international conferences sponsored by VAFoST, FIFSTA (Federal Institution of Food Science and Technology of ASEAN) and IUFoST (International Union of Food Science and Technology).

Research:

- 1999 - 2005: Key person of project on *Transferring technology of interferon production from Ukraine to Vietnam* cooperated with Kiev Institute of Molecular Biology (Ukraine) and sponsored by Ministry of Science and Technology (MOST).
- 2001 - 2003: Manager of R&D Project on *Modifying cassava starch by using enzymatic method*, sponsored by Hochiminh city Department of Science and Technology (DOST).
- 2004 - 2006: Manager of Project on *Production of maltodextrin from cassava starch* sponsored by DOST of Hochiminh city.
- 2006 - 2007: Manager of R&D project on *Converting cassava starch hydrolyzates into IMO*, sponsored by Vietnamese Academy of Science and Technology.
- 2008 - 2010: Manager of R&D project on *Obtaining IMO and polydextrose from cassava starch by chemical and enzymatic methods* sponsored by DOST of Hochiminh city.

Publications:

Reference books

- **Hoang Kim Anh**, Ngo Ke Suong, Nguyen Xich Lien (2005), *Cassava starch and products from cassava starch*, (Reference book, 221 pages), Science and Technology Publication Company.
- **Hoang Kim Anh** (2006), *Food Chemistry*, (Reference book, 450 pages), Science and Technology Publication Company.

Papers

- **Hoang Kim Anh**, Ngo Ke Suong (1999), *Study on technology of maltodextrin production form rice and cassava starch*, Proceeding of National conference of Biotechnology, p. 627-635.
- **Hoang Kim Anh**, Ngo Ke Suong, Nguyen Xich Lien, Nguyen Kim Giao (2002), Study on cassava raw-starch digesting of amylases by using scanning electronic microscope, *Journal of Biology* 3(24), ISSN 0866-7160, Science and Technology Publication Company.
- **Hoang Kim Anh**, Ngo Ke Suong, Nguyen Xich Lien (2003), Properties of some new microbial amylases, *Journal of Biology* 2(25), ISSN 0866-7160, pgs. 39-44, Science and Technology Publication Company.
- **Hoang Kim Anh**, Ngo Ke Suong, Nguyen Xich Lien (2003), Study on kinetics of starch hydrolysis of α-amylase, *Journal of Science and Technology* 40(4), ISSN 0866 708X, Science and Technology Publication Company

- **Hoang Kim Anh,** Ngo Ke Suong (2003), *Effect of amylose, amylopectin fraction and structure characteristics of cassava starch on hydrolysis ability of amylases*, Proceeding of National Conference of Life Science, Hue 04/2003.
- **Hoang Kim Anh,** Ngo Ke Suong , Nguyen Xich Lien (2003), *Characterization of maltohexaose-forming α-amylase from Bacillus subtilis***,** Proceeding of ASEAN Food Conference, Hanoi September 2003.
- **Hoang Kim Anh**, Ngo Ke Suong, Nguyen Kim Giao (2003), *Raw-starch Digesting Amylase from Aspergillus kawasaki*, Proceeding of ASEAN Food Conference, Hanoi September 2003.
- **Hoang Kim Anh** (2003), *Production of maltodextrin from cassava starch by using maltohexaose forming α-amylase from B. subtilis*, Proceeding of National conference of Biotechnology, Hanoi December, 2003.
- Nguyen Thach Minh, Nguyen Xich Lien, **Hoang Kim Anh** (2007*), Malting characteristics of different varieties of rice (oryza sativa)*, Proceeding of 10th ASEAN Food Conference, Kuala Lumpur, Malaysia.
- Tran Quoc Hien, Le Van Viet Man, **Hoang Kim Anh** (2007), *Comparison of the fermentation characteristics of the free and immobilized yeasts in high gravity brewing*, Proceedings of the 10th ASEAN Food Conference, 21st-23rd August, 2007, Kuala Lumpur, p. 137
- Tran Quoc Hien, Le Van Viet Man, **Hoang Kim Anh** (2008), *Influence of yeast and alginate concentration in alginate gel beads on the fermentation characteristics of immobilized yeast in high gravity brewing*, Proceeding of National conference of Biochemistry, p.295-299.
- Thach Minh Nguyen, Xich Lien Nguyen, **Kim Anh Hoang** (2008), Effect of steeping conditions to quality of rice malt, *Industrial review of Vietnam*, ISSN 0868-3778, pgs. 49-51.
- Thach Minh Nguyen, Xich Lien Nguyen, **Kim Anh Hoang,** Soo Lee (2008), Optimization of Rice (Oryza Sativa) Malting process by second order Experimental design, *J. of the Korean Oil Chemist's Soc*, ISSN 1225-9098, Vol. 25, No. 3, pgs 282-290
- **Hoang Kim Anh**, Luu Duan, *Recent starch Industry in Vietnam*, Proceeding of Carbohydrate Division, KoFoST Conference, Kwangju – Korea, 06/2008.
- Luu Duan, **Hoang Kim Anh,** *Overview of Vietnam Food Industry*, KoFoST Conference, Kwangju – Korea, 06/2008.

演講摘要

越南米食加工與米製品之發展現況

Overview of rice processing and products in Vietnam

OVERVIEW OF RICE PROCESSING AND RICE PRODUCTS IN VIETNAM

Kim Anh Hoang, Ngoc Hieu Tran
Saigon Technology University, Vietnam Association of Food Science and Technology

Rice production plays a vital role in the agricultural and rural development of Vietnam. About 80% of 11 million farming households in the country participates in rice production. As rice is their main food and product for earning so all policies on agricultural and rural development cannot be put apart from rice production development.

In 1986, the paddy growing area of the whole country was only 5.7 million hectares with an average yield of 2.96 tons per hectare per crop and a production of 16.87 million tons. By 2007, the above three factors were 7.2 million hectares, 4.98 tons per hectare per crop and 35.86 million tons. Mekong river delta and Red river delta are two leading regions of the country in terms of paddy growing area and production. These delta regions occupy about 66% of the total rice production area and provide up to 70% of the total material paddy yield of the whole country. Rice factories are most located in major rice growing regions such as Cuu Long River delta, provinces in the south and central part and Red river delta. Rice commodity for export is most provided by the Cuu Long River delta. The rate of rice commodity reaches 80% to 85% of the total rice yield of the country.

Rice production in Vietnam mainly bases on small scale or household scale with traditional manual cultivation methods. Currently it still depends much on weather; typically it might be affected during very cold time in the beginning and at the end of the year in the north and by protracted diluvia rains in the central part or threatened by epidemic diseases. However, to improve rice productivity, Vietnam is gradually applying advanced technology in each production phases. The mechanical phase in rice production in the Cuu Long river delta is getting better and better. Up to now, phases of soil working and irrigation have already been highly mechanicalized. Rice threshers and husking machines have relatively met farmers' demands. Most Vietnamese farmers dry paddy by exposing paddy to the sun. Only some dry paddy by machines. Recently, the application of rice drying technology has been getting more and more concerns of farmers in the Cuu Long river delta.

For rice processing, technology level applied in rice processing in Vietnam has been getting gradually improved. Various private rice processing units have got processing capability of more than 10,000 tons per year. Bigger scale enterprises have got an average processing capability of 50,000 tons to 60,000 tons per year. Some enterprises have got processing capacity of more than 100,000 tons per year. Lots of Vietnamese enterprises are now continuing to renovate their technology, equip rice polishing lines with a capacity of 8 tons per hour in order to improve their rice quality

to compete with foreign rice.

Rice husking lines and bran drying machines are of big capacity. Systems of high standard stocks are placed at major food areas and equipped with state-of-the-art conveyor belts to import and export rice. Experiment and analyze rooms to check rice quality are equipped with several modern specializing machines such as: white level measuring machines, amylose level measuring machines, electronic colour splitting machines, thickness classifying drum, quality controllers, electronic analyzing scales, quick humidity measuring machines, microscopes, etc. Processing methods are done with high automatic level and less depend on operators subjectively. Processing lines are operated stably and confidently.

Sanitation and quality control processes have been improved and achieved high effectiveness. After going through these processes, rice can be selected identically, rate of unbroken rice grains is high and rice surface quality is good. Machining system is clean-limbed, does not occupy land and is easy to be operated thanks to automatic control systems. Dust and noise are treated instantly inside the machines so environmental pollution can be avoided.

In the past, having adequate food was a big concern to Vietnamese people as paddy production was passively developed. But now rice has always been a traditional strong export of Vietnam. The country has just started to export rice since 1989 but by 2003 Vietnam became the second biggest rice exporter of the world and its rice export value reached USD 1 billion by the end of 2005. In the year of 2011, Vietnam expects to export 7 -7.5 million tons of rice, worth 3.5 billion USD.

Vietnam produces two major kinds of rice including sticky rice and ordinary rice of high and normal quality. Besides, Vietnam also produces rice parboiling and tacky rice, etc. Varieties of Vietnamese ordinary rice classified according to structures, shapes and colours. According to structures and shapes, there are long grain rice, middle grain rice and short grain rice. According to colours, there are brown rice, white rice, red rice and black rice.

Vietnam exports following kinds of rice: 5% broken rice polished one time, 5% broken rice polished twice, 10%, 15%, 20% and 100% broken rice. Besides, Vietnam also exports glutinous and sticky rice, ordinary rice, rice parboiling and fragrant rice. Vietnamese export rice is taken from five main rice varieties including OM1490, MTL250, OM2031, VND95-20 and IR64.

There are two kinds of Vietnamese high quality rice including special quality rice and fragrant rice. Fragrant rice varieties have got very specific flavors. In the current export structure, white rice still predominates. Currently, some kinds of Vietnamese fragrant rice are also exported but since their quality standards have not been recognized internationally and got no specific brands so their export price is not much higher than ordinary rice. Vietnamese rice can be cooked or used to produce

noodles, vermicelli, etc. Many Vietnamese traditional products such as noodle, cake, and alcohol have been made from rice. The traditional rice products have also been successfully commercialized.

Many rice production areas in Vietnam have now started to grow rice in accordance with international quality standards. For future development, power sources from both the state and people will be gathered to strongly develop commodity rice of high quality in the two major rice production areas being Cuu Long river delta and Red river delta to meet the higher and higher demands of domestic and foreign markets.

演講簡報

越南米食加工
與米製品之發展現況
Overview of rice processing and products in Vietnam

Kim Anh Hoang, PhD
Ngoc Hieu Tran, MSc
Saigon Technology University

RICE PROCESSING IN VIETNAM

CONTENT

- Introduction
- Rice harvesting
- Processing rice for export
- Traditional products form rice

INTRODUCTION

- Vietnam now is **a second bigest rice exproter** in the World

- In 2010: exported **6.75 million tons**
- In 2011: will reach **7 -7.5million tons** (new record level)

- As coffee industry, rice processing industry in Vietnam may suffer the **adverse impacts of climate change,** which are likely to be seen by as early as 2020.

- By the end of the century, the ADB has anticipated that climate change might result in:
  - Sharp **decline in rainfall**
  - along with a **rise in sea levels**
  - **submerge tens of thousands of hectares of cropland**

II. RICE HARVESTING

Harvesting

- Harvesting is the process of **collecting the mature rice crop** from the field.
- **Harvesting at the right time and in the right way maximizes grain yield** and **minimizes grain losses** and quality deterioration.
- **Post-harvesting technology** affects the quantity and quality of paddy and the finished rice product.
- **Losses in paddy and rice** during the post-harvest operations amount to **about 10% of field production**

- Depending on the size of the operation and the amount of mechanization, **rice is either harvested by hand or machine.**

The average **farm size** in the Red River Delta is **0.256 ha**

average yield for paddy in Viet Nam is currently **4.3 tons per hectare**. Some areas in the Mekong Delta are able to produce up to **10-12 t/ha/crop**

- Process of beating paddy plants to **separate the seeds or grains from the straw.**
- Should be done **immediately after harvesting.**
- Threshing can be done **manually or mechanically.**

- **Avoid field drying and stacking for several days** as it affects grain quality due to over drying.
- Stacked grains of high moisture content **results in discoloration or yellowing.**

Drying

- **Remove excess moisture from the grains.**
- **Proper drying results in:**
  - increased storage life of the grains
  - prevention of deterioration in quality
  - reduction of biological respiration that leads to quality loss of grains
  - optimum milling recovery.
- **Methods:** sun drying, mechanical drying, chemical drying

- **Sun Drying:** traditional and economical method

Mechanical Drying: by ventilating natural or heated air through the grain mass

Chemical Drying: spray salt solution with specific gravity of 1.1 to 1.2 on the ears of the mature paddy crop to reduces the moisture content from 29% to 14.5% after four days.

III. PROCESSING RICE FOR EXPORT

Rice processing procedure

Cleaning

- Removes foreign objects, such as hey, stone, tree stump from the paddy.

Paddy Cleaner

PaddySeparator

Hulling

- Hulling is the process to **remove the hull from the kernel**
  - brown rice needs no further processing.
  - If white rice is desired, the brown rice is milled to remove the outer bran layers.
- Hulling can be done **by hand** by rolling or grinding the rough rice between stones.
- However, more often it is processed at a mill with **automated processes**.

Milling

- **Remove the bran layer** from brown rice.
- **Use both abrasion and friction** to gently and efficiently convert brown rice to milled white kernels.
- The **bran layer is moved by air ventilation.**
- Process usually takes **2 to 3 cycles**, depending on the required milling degree.

Small rice milling factory in Sadec

Polishing

- Smoothing and brightening a surface of rice grain by a roll or series of rolls.

Grading and sorting

- Grain quality depends on the **variety of rice, crop production environment, harvesting, processing and milling systems.**
- **Removes rice defects,** such as discolorations, yellows, immatures (green), chalky, peck, seeds, red rice, glass, stones
- **Separate milled rice** (mixture of different sizes: whole grain, head rice, and broken rice

Characteristics Considered for Grading of Milled Rice

- Dead rice, **broken and brewers percentages**
- Defectives
- Foreign matter
- Presence of paddy
- Whiteness
- Chalkiness
- Moisture content

Special meal from broken rice

- The rice processing system in Vietnam is veryfragmented, using **"two-stage" milling**:
  - small de-huskers mill paddy
  - then sold as brown rice to larger millers for final milling.

- **Mixing of different rice varieties** by the numerous small dehuskers in milling process results in
  - high levels of "broken rice"
  - lower quality end-product
  - lower prices

→ **Market chain driven by volume, not quality.**

Parboiled rice

- Parboiled rice is produced **using a steam pressure process prior to milling.**

- Rice is parboiled in the hull which softeners the kernel, allowing the surface starch, bran and other components to commingle.

- The water is then drained and **the rice is carefully steam dried.**

- The dried parboiled rice is sent through machines which **remove the hull and polish the kernels**.

Pack / Storage

- The finished rice will be packed and stored in individual bads, according to its grade

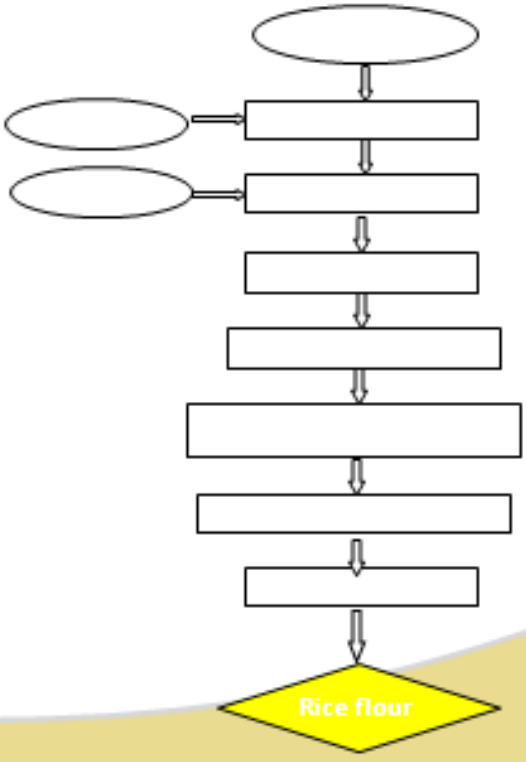
Vietnam rice products

Low levels of processing technology little value is added by rice-based processed products

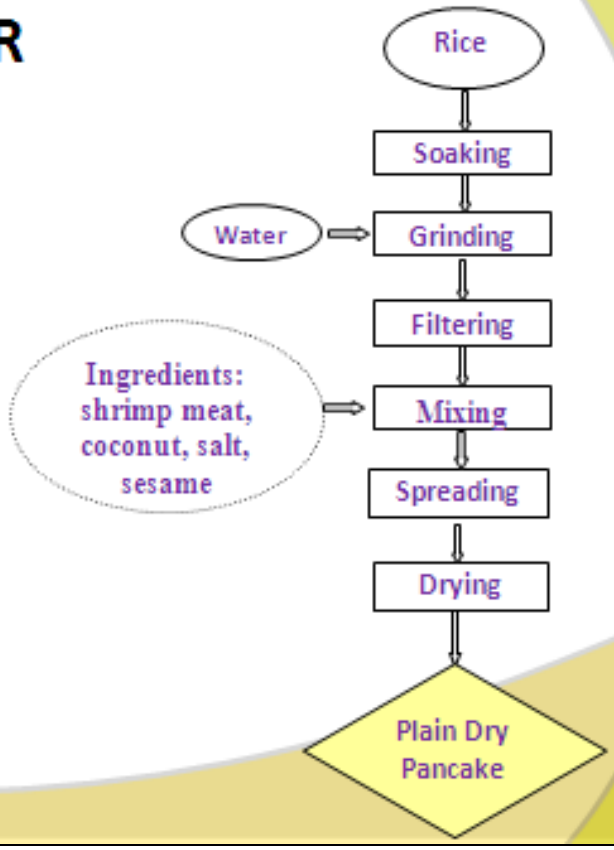
III. TRADITIONAL PRODUCTS FROM RICE

- Rice flour
- Rice paper and spring roll
- Rice noodle and "Pho"
- Rice cake
- Rice alcohol

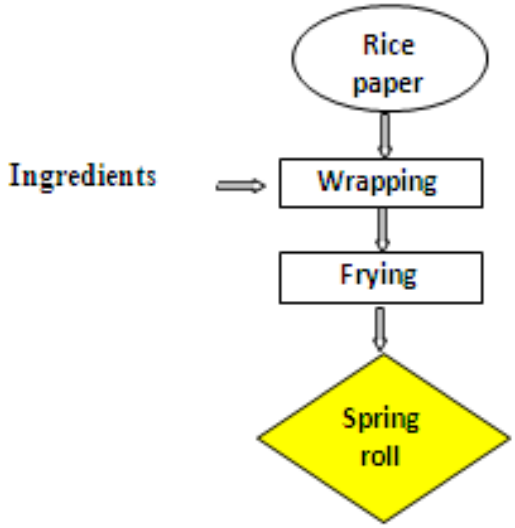
1. RICE FLOUR



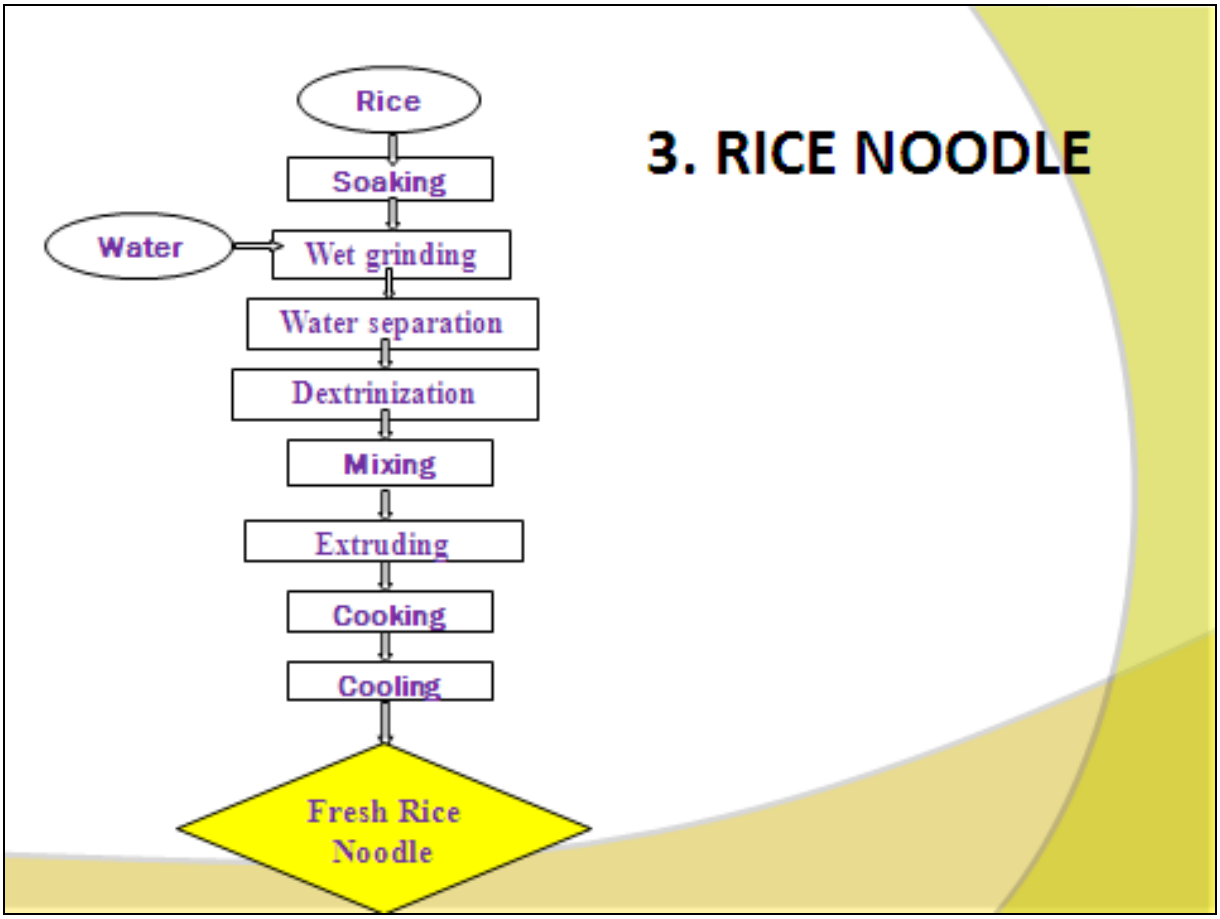
2. RICE PAPER

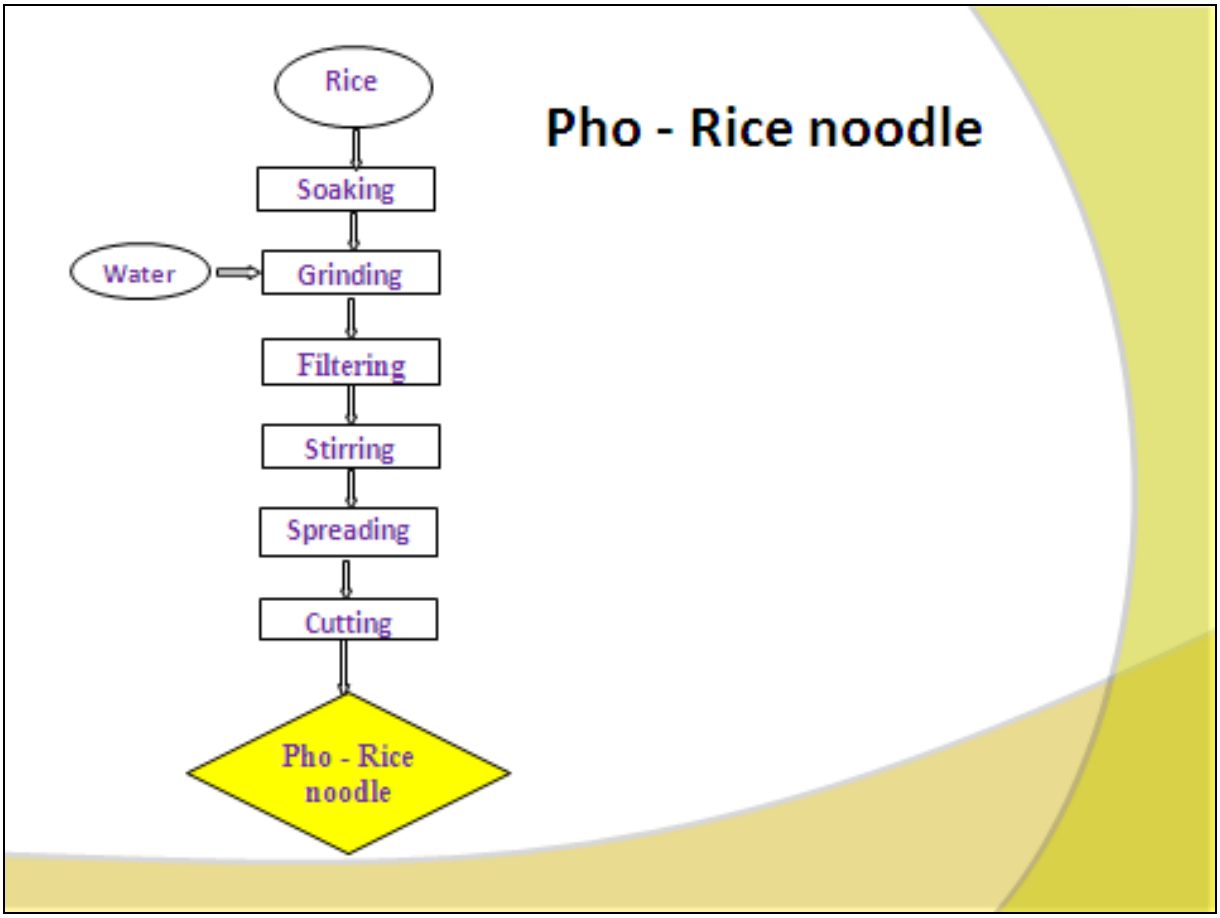


Spring roll



Ingredients: pork, egg carrots, cabbage, mushroom, Spices: ginger, garlic, salt, chili, pepper…)


Rice
Soaking
Water
Wet grinding
Water separation
Dextrinization
Mixing
Extruding
Cooking
Cooling
Fresh Rice Noodle
3. RICE NOODLE


Rice
Soaking
Water
Grinding
Filtering
Stirring
Spreading
Cutting
Pho - Rice noodle
Pho - Rice noodle

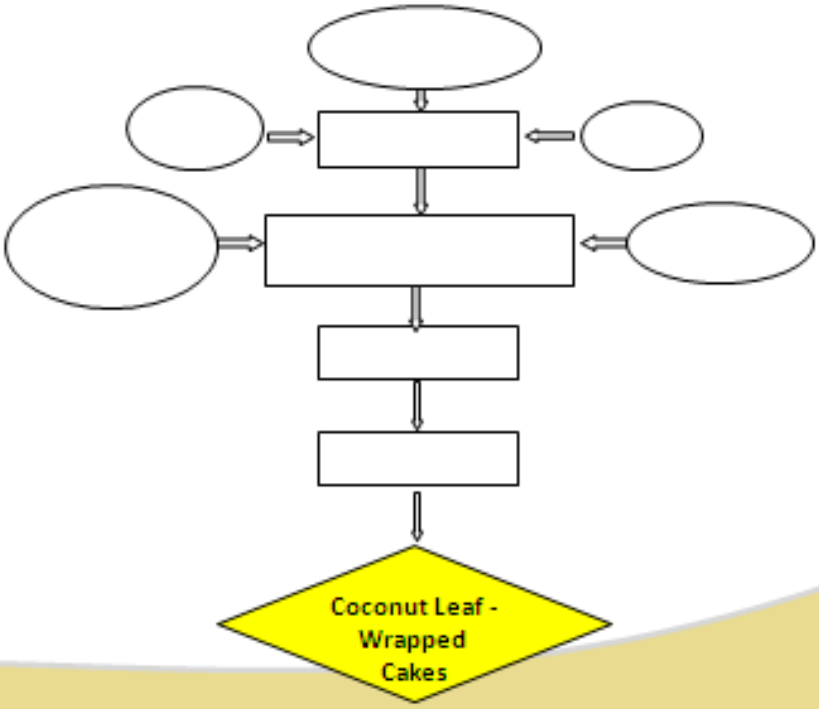
How to make “phở”

Ox tail

Beef bone

4. RICE CAKE

Coconut Leaf-Wrapped Cakes



1. Sticky rice

3. Prepare stuffing

2. Mung bean soaking

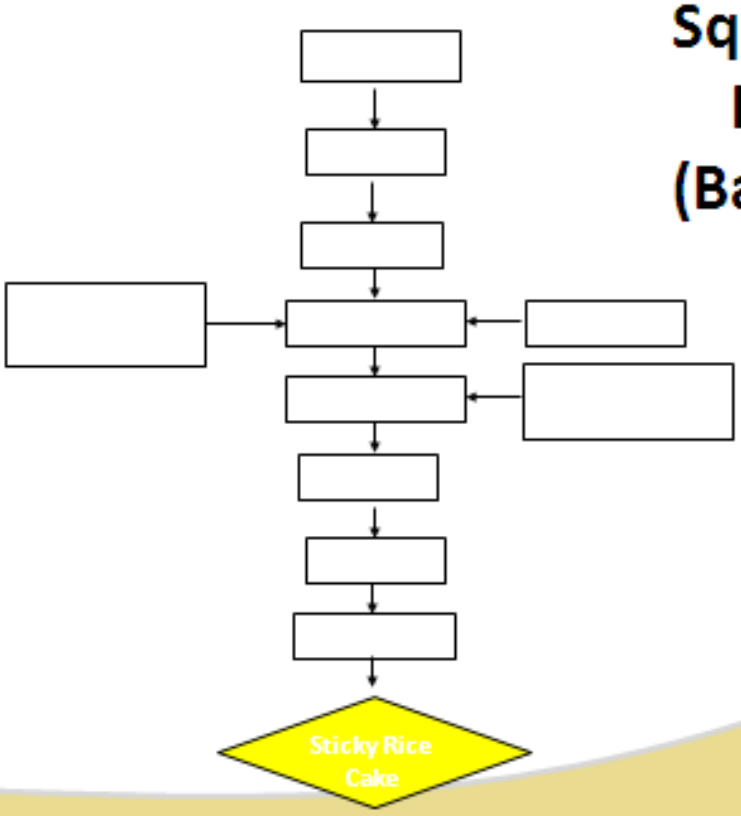
4. Wrapping

5. Tie

6. Cooking

7. Product

Square Sticky Rice Cake (Banh Chung)



Wood pattern/frame

Materials

1. Wrapping

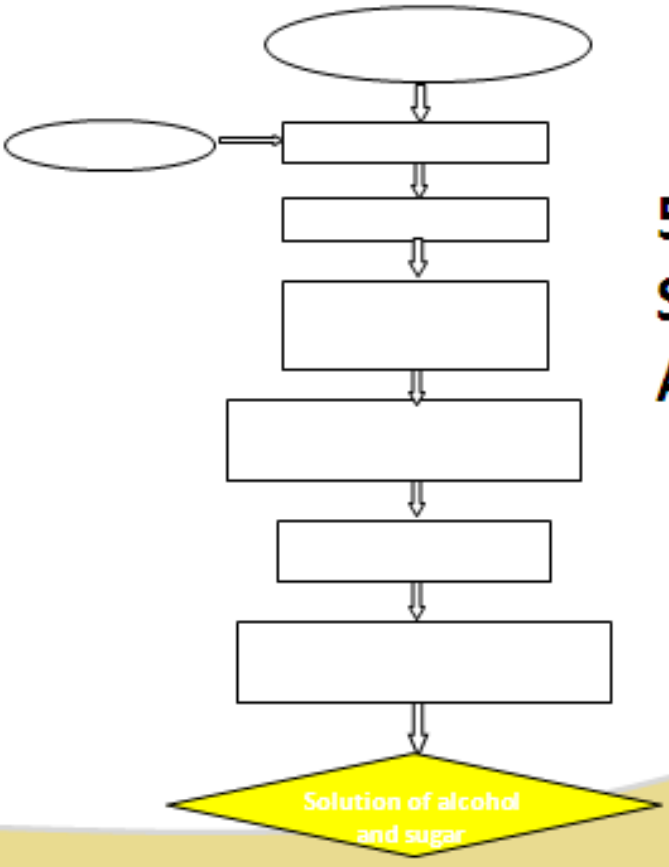
2. Tie

3. Place in large pot

5. Cooking

6. Submerge into cold water

5. Served with pickle onion, carrot and kohlrabi



5. BROWN STICKY RICE ALCOHOL

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Curriculum Vitae

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- Training of Wheat Quality 1983 The International Maize and Wheat Improvement Center, Mexico.
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- Rice: Science and Technology (In Thai).

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Cereal Technology	Fundamental of Food Analysis
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Biochemistry of Food	Nutrition in Food Processing

Membership in Professional Societies:

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- Food Science & Technology Association of Thailand**.**

Selected Publications:

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演講摘要

泰國米食加工
與米製品之發展現況
Overview of rice processing and products in Thailand

Overview of Rice Processing and Rice Products in Thailand

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Rice is life for us, Thai as well as others Asian and more than half of the world population eats it as a main staple food for balance nutrient contents of carbohydrates, protein, fat, ash and including vitamins and minerals. Rice is also the way of life of Thai people from the ancient till now a day. Rise is a part of our blood streams, inherited the nation's valuable legends from the king to poor people and from generations to generations. Our ancients learned how to process rice grain by hand-pounded paddy rice to separate husk from the brown rice (hand-pounded rice) and cooked it in the bamboo stem as now called "Khao Lam" which is made from sticky-rice (glutinous rice) only. Today, we have many kind of rice varieties which could be divided to 2 groups as non-glutinous rice (low, medium and high amylose content) and glutinous rice (no amylose) and many colored brown rice, such as normal brown, pink, red, purple, black and others. This colored brown rice is gained more interesting to consumers who concern health and beauty. Thai scientists have successfully developed new rice varieties for high nutrients as "Riceberry" which is well-know antioxidant properties and high vitamins minerals, "Sinlek" which is iron bio fortification rice and also rice against diabetes.

Rice processing in Thailand is first concerned with the milling and polishing the paddy rice. There are four main steps in processing; the first step is the cleaning process to remove foreign materials. The second step is the milling of the cleaned paddy rice to remove the hull, using a disc huller or rubber roll shelter. This produces a mixture of whole grain brown rice, broken brown rice, unshelled paddy rice and hull. The hull is removed by aspiration, and the remaining rice is conveyed to a paddy separator to separate the brown and rough rice. The brown rice is pearled and polished to remove the bran (composed of pericarp, testa, germ and the aleurone layer) in this third step. The last step of milling is sizing of the white rice, and then weighing and packing it. The main rice product is white rice and the by-products are broken white rice, bran and hull.

Thailand also produces high capacity of parboiled rice to export to many countries, such as Bangladash, Sri Lanka, the Middle East, West African, Europe and America. The parboiling process starting from cleaning the paddy rice, steeping it in the water, steaming and drying it before normal milling. This pretreatment modifies the physical, chemical, and biochemical properties of the grain, which improves it

milling and nutrition quality but also produces a brown-yellow color and a particular smell and flavor milled rice.

The rice products from the milling process are primary products, such as white rice, brown rice, colored rice, high nutrient rice, pre-germinated brown rice, etc, which need to be cooked before eating. The by products are broken rice, rice bran and husk. The broken white rice is normally processed by wet milling to be flour which is also primary product to further processed to various kinds of products, such as snacks and sweets. The rice noodle products are made from broken white rice using wet milling and then continued process to be rice vermicelli, strip-rice noodle, etc. Fresh rice bran is a valuable by-product to produce high quality rice bran oil from normal solvent extract or cold-pressed extract which could be used as functional ingredient for foods and cosmetics.

Pre-germinated brown rice is popular among Thai consumers due to its health benefits for higher amount of nutrients, softer texture and easier to digest than normal brown rice. The process is involved soaking the paddy or brown rice until being saturated before incubation. The pre-germinated paddy or brown rice would have the embryoric growth between 0.5-3.0 mm lengths. The activity of pre-germination process in paddy or brown rice is inactive by heating and drying.

Now a day, the consumers prefer eating as mood consumption concept which is concerned life-styles and conveniences. The ready-to-eat rice products are increasing by using fermenting, heating, drying and cold technologies.

Rice is mainly composed of starch, which can be utilized by micro-organisms through saccharification and alcoholic or acetic fermentation to produce various fermented rice products, such as, fermented rice noodle (Kanomjeen) which is dried and instant for ready-to-eat. Khao-Mak is fermented sweet rice made from glutinous rice, Ou and Nam-Khao is an alcoholic beverage and rice vinegar. These fermented rice products are provided nutrients, flavor and taste for consumers.

Thermal process is aimed to ensure to destroy the most heat resistant bacterial spores in rice products by high heating at least 250℉ (121℃) of wet heat for at least 15 min as sterilized rice can or retort pouch products. The pasteurized pre-germinated rice drinks which is heated about 60℃, 30 min to destroy the pathogenic micro-organisms only. This product should keep in refrigerator for quality and taste.

The heat moisture treatment rice flour was modified by using low moisture levels (< 35% moisture w/w) over a period of time (16 h) at the temperatures ranged from 84-130℃. This rice flour could improve quality of rice noodle and replace wheat flour for alkaline noodle, cake and cracker, etc. The annealing treatment is a process whereby starch granules in excess (>60% w/w) or at intermediate water content (40% w/w) are held at a temperature above the glass transition temperature but below the onset temperature of gelatinization for a set period of time. Annealing has been

described as a crystal growth or perfection, diffusion controlled non-equilibrium process. The annealed fermented rice flour could be used to improve the quality of ready-to-eat frozen Kanomjeen.

The drying process utilizes heat to vaporize and remove water. Under vacuum, water can be removed at reduced temperature, and oxidative changes are minimized. The freeze-drying process is frozen quickly and placed in a chamber under high vacuum to be an instant infant rice powder.

The cold process is the way to remove heat from the rice products as chilling and freezing. The chilling process is using low temperature to lower rate of biochemical changes in foods and slower microbial growth. The freezing process is aimed to stop biochemical changes and microbial growth, while nutritive value and flavor of food are well preserved.

Processed rice products could be innovated from the rice grain in its various forms due to its compositions and processing methods which should aim for health, beauty, and convenience. Some innovated food products are organic rice products, pre-germinated brown rice, low-calories salad dressing, rice bran oil high oryzanol, cereal cream, amino rice milk, instant-fermented rice noodle, rice cake, energy rice drink, baby rice pudding, young rice milk snack, fiber rice noodle, etc. The market of Thai rice products is promoted by OTOP (One Tambon One Product) and the exports.

Note

Note

Note

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研究領域

1.中草藥之腦神經保護

2.抗癌天然物

3.保肝中草藥之研究

4.台灣式安寧照顧

5.活性天然物化學

6.腎保護之中草藥

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演講簡報

米食：由主食到保健

Rice : from staple food to nutraceuticals

Symposium on Rice Products and Nutrition

- *From Staple Food to Nutraceuticals*

臺灣好米養生

September 15, 2011

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- 教育部醫學教育委員會委員
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- 展杏文教基金會執行董事
- 臺灣科學總編輯

- **Rice** is the staple food for nearly two-thirds of the world's population
- **Brown rice** (BR)
- **Germinated brown rice** (GBR)
- **partially-milled rice** (PMR) contains more health beneficial food components
- **well milled rice** (WMR)

白米、糙米、發芽米、胚芽米、

稻穀要碾成米，大致上分為兩個階段。

- 首先，將稻穀脫殼（脫下的稻殼稱作「粗糠」）保留稻米上的麩皮及胚芽，這叫做「糙米」
- 接著，再送進精米機碾（脫下的麩皮稱作「米糠」），出來的就是「白米」

發芽米

http://www.youtube.com/watch?v=PguhcvZtxg

發芽米所含之營養素比白米高，尤其糙米中的酵素完全活化後含有豐富的γ－胺基酪酸（GABA）、磷酸六肌醇（IP6）、肌醇（Inositol）、阿魏酸（Ferulic acid）、維生素 B 群、維生素 E、鎂、鉀、鈣、鋅、蛋白質及食物纖維等。食物纖維有預防便秘、高血脂肪症與大腸癌症的發生；肌醇可預防脂肪肝與動脈硬化；阿魏酸可去除活性氧，抑制麥拉寧色素生成；鎂可預防心臟病；鉀可預防高血壓；鈣可預防骨質疏鬆症；鋅可防止生殖功能低下與動脈硬化作用；維生素 E 可抑制活性氧的活動，保護肌膚防止紫外線以及抑制膽固醇增加；尤其 GABA 是氨基丁酸茶的主要成份，可以降低血壓穩定神經與提高腎臟與肝臟功能；六磷酸肌醇（IP6）具有抗氧化作用，有助人體免疫力提昇，對部份癌症細胞有抑制效果。

發芽米

Germinated brown rice

- Germinated brown rice are known to provide health improving benefits due to their various biological activities.
- These possible health beneficial effects included antioxidant,.....
- Paper reviews in the world research.

Immunomodulator

J Nutr (2007) 46:391–396

Pre-germinated brown rice could enhance maternal mental health and immunity during lactation.

Learning and memory

- *Biol Pharm Bull.* 2004 Jul;27(7):1041-5
  Effects of pre-germinated brown rice on beta-amyloid protein-induced learning and memory deficits in mice.

- *Chem Biol Interact.* 2010 Mar 30;184(3):484-91.
  Protective effects of pre-germinated brown rice diet on low levels of Pb-induced learning and memory deficits in developing rat.

Hypocholesterolemic action

- *Life Sci.* 2006 Feb 4
  Hypocholesterolemic action of pre-germinated brown rice in hepatoma-bearing rats.

- *J Nutr Biochem.* 2007 Feb;18(2):105-12.
  Rice bran oil and oryzanol reduce plasma lipid and lipoprotein cholesterol concentrations and aortic cholesterol ester accumulation to a greater extent than ferulic acid in hypercholesterolemic hamsters.

- *J Agric Food Chem.* 2011 Jul 27;59(14):7985-91.
  Improving the lipid profile in hypercholesterolemia-induced rabbit by supplementation of germinated brown rice.

- *Ann Nutr Metab.* 2007;51(6):519-26.
  Cholesterol-lowering and antioxidant status-improving efficacy of germinated giant embryonic rice (Oryza sativa L.) in high cholesterol-fed rats.

Diabetic

- *J Med Invest.* 2005 Aug;52(3-4):159-64 Postprandial blood glucose and insulin responses to pre-germinated brown rice in healthy subjects.
- *Biol Pharm Bull.* 2005 Aug;28(8):1539-41. Insoluble fiber is a major constituent responsible for lowering the post-prandial blood glucose concentration in the pre-germinated brown rice.

- *Nutr Sci Vitaminol (Tokyo).* 2008 Apr;54(2):163-8. Effects of pre-germinated brown rice on blood glucose and lipid levels in free-living patients with impaired fasting *glucose or type 2 diabetes*
- *Nutr Sci Vitaminol (Tokyo).* 2010;56(5):287-92. Replacing white rice with pre-germinated brown rice mildly ameliorates hyperglycemia and imbalance of adipocytokine levels in type 2 diabetes model rats.

Cancer cell proliferation and apoptosis.

- *J Med Food*. 2004 Spring;7(1):19-23
  Effects of germinated brown rice extracts with enhanced levels of GABA on cancer cell proliferation and apoptosis.

  brown rice extracts with enhanced levels of GABA have an inhibitory action on leukemia cell proliferation and have a stimulatory action on the cancer cell apoptosis.

Cancer Prevent

- *Life Sci.* 2006 Jun 13;79(3):259-64.
  Hypocholesterolemic action of pre-germinated brown rice in hepatoma-bearing rats.

- *Nutr J.* 2010 Mar 26;9:16.
  Germinated brown rice (GBR) reduces the incidence of aberrant crypt foci with the involvement of beta-catenin and COX-2 in azoxymethane-induced colon cancer in rats.

Neuroprotection

- *Nutr Metab (Lond).* 2007 Nov 23;4:25.
  Effect of pre-germinated brown rice intake on diabetic neuropathy in streptozotocin-induced diabetic rats

Antidepress

- *Pharmacol Biochem Behav.* 2007 Jan;86(1):62-7
  Effects of pre-germinated brown rice on depression-like behavior in mice.

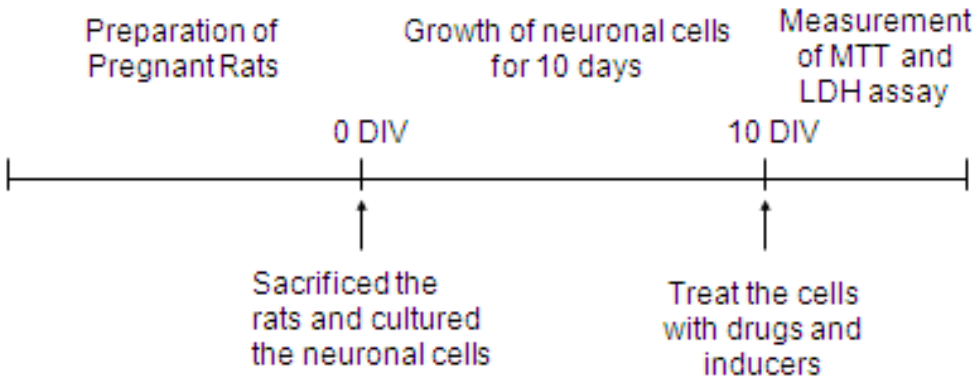
Neuroprotection of Germinated Brown Rice Extracts in Raot Primary Culture Neuron and PC-12 cell

- Neuron protective effects of *Oryza sativa* seed extract against cell damage caused by glutamate and hydrogen peroxide in PC-12 cell

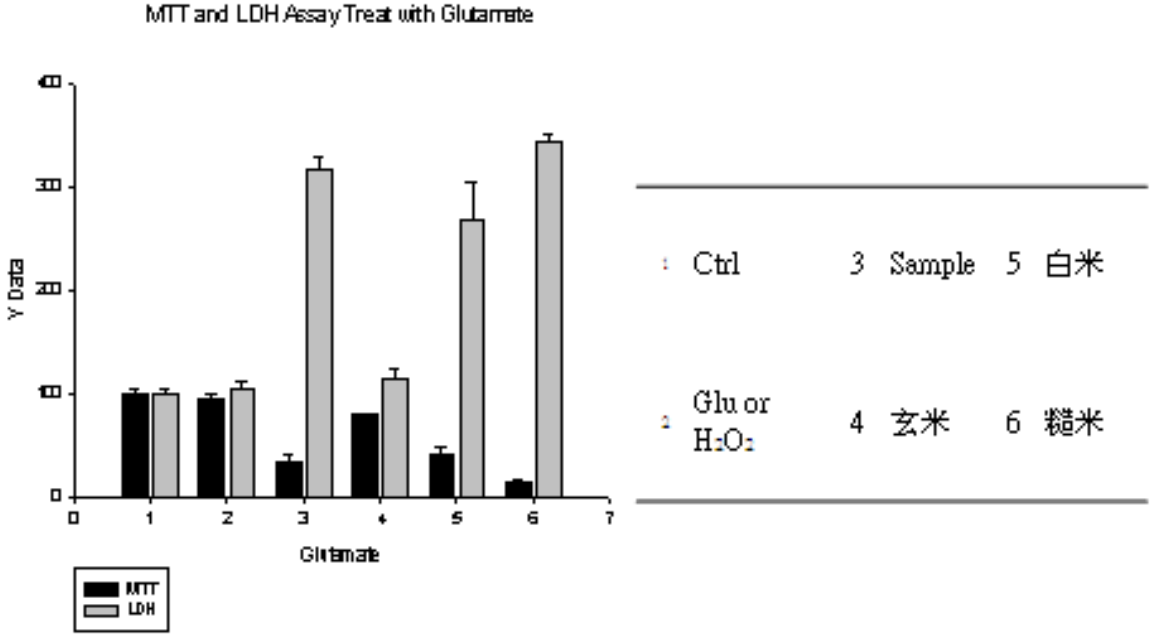
Material

- PC 12 cell
  on protection of neuronal PC 12 cells, derived from a transplantable rat pheochromocytoma, under cell-damaging oxidative stress.
- Wistar female rat
  They were purchased from the animal center of Taiwan University
- The ethanolic extracts of white rice, brown rice, brown germinated rice and water extract powder of brown germinated rice

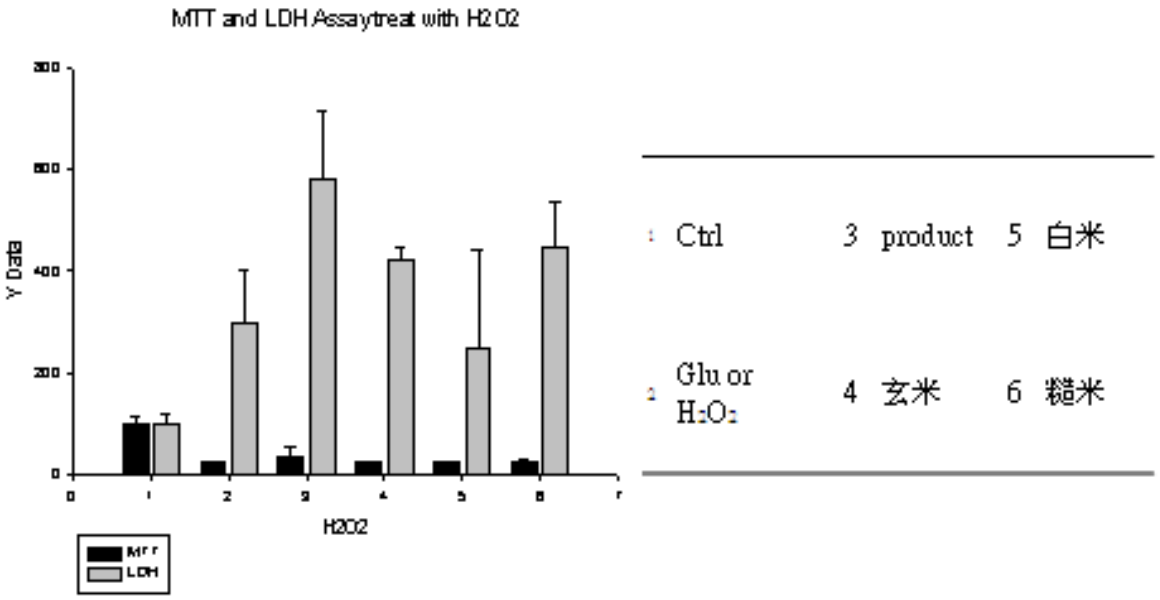
Primary Culture Neuron



Protective effects on neuron damage induced by glutamate in primary culture neuron



Protective effects on neuron damage induced by H_2O_2 in primary culture neuron



Total Phenolics

- Total phenolics of each extract were measured by the spectrophotometric analysis (*25*). Briefly, an aliquot (0.2 mL) of appropriately diluted extracts was mixed with 2.6 mL of DDW. A reagent blank using 2.8 mL of DDW was prepared.
- At zero min, Folin-Ciocalteu's phenol reagent, 0.2 mL, was added to the mixture and then shaken. Two mL of 7% Na_2CO_3 solution was added after 6 min. After 90 min at 23 °C, the absorbance was read against the prepared blank at 750 nm.
- Total phenolics in various cherry cultivars were expressed as mg gallic acid equivalents (GAE)/100 g of fresh cherry. Each extract was analyzed in three replications.

PC-12 Cells

- Cells were derived from a transplantable rat adrenal phaeochromosytoma.
- Cells synthesize and store catecholamine, and dopamine.
- Cells possessed neuronal properties after treating by NGF (Neuron Growth Factor).

Results

- As the results, GBR and 白米 have effect of neuronal protection in glutamate induced neuron damage in primary rat neuron culture.
- GBR have effect of neuronal protection in H2O2 induced neuron damage in primary rat neuron culture.
- GBR have effect of neuronal protection in glutamate induced neuron damage in PC-12 cells.

Nutraceuticals

Eastern meet western to be more…….

- Staple Food.
- Evidence based from the biotechnology technique to scientific proof.
- Green medicine (Phytochemicals traditional medicine , folk medicine , enthnobotany).
- New Nutraceuticals.

- ***Staple Food + Traditional Medicine***
- ***It will change your life style and world….***

吃補的目標

- **什麼時候需要「補」？**
- **怎樣「補」才能符合人體健康之需求？**
- 一、養生之食：平常健康的人為求更健康，注意每日攝取之飲食，以能達到保健、預防之目的。
- 二、食療之食：生病初期時，根據疾病之病況，配供以食物藥膳，以達早日康復之目的。
- 三、藥補之食：生病後，在恢復期擬借用中藥湯液以治病。服之即可加速恢復健康之目的。

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

枸杞

- **中名：**枸杞
- **學名：**Lycium chinense Mill.
- **科名：**茄科(Solanaceae)
- **別名：**地骨子、甘杞、杞子、血杞、苦杞、枸忌、天精子。
- **用部：**成熟果實。
- **功效：**明目、補肝、滋腎、潤肺、抗衰老、養顏美容和提升免疫力。

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

枸杞

- 成分:含有18種氨基酸，大量的胡蘿蔔素，維生素B、維生素C，以及鈣、磷、鐵等物質。
- 現代醫學研究證明，枸杞不僅被用於防治糖尿病、高脂血症、肝病及腫瘤，對防治眼疾更有特殊的醫療價值。
- 枸杞中含有大量胡蘿蔔素，進入人體後在人體酶的作用下，可以轉化成維生素A，維生素A向來被看做保護眼睛、防止視力退化的特效維生素，由此可知枸杞對眼睛有保健的功效。

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

枸杞悄然走進英國超市

一向對中藥持慎重態度的西方人，卻發現了枸杞的妙用。在中國，枸杞明目、壯陽的功效早已家喻戶曉。但這種產自青藏高原，西方世界仍然對它陌生的水果，正悄然「走入」西方人的食譜和超市。

枸杞在美國早已開始流行。瑪丹娜、伊麗莎白。赫利、米沙。巴頓等國際巨星，都對枸杞情有獨鍾。隨著受歡迎程度的提高，枸杞也被英國特易購超市作為一種保健乾果去介紹給英國的廣大消費者。

原先對枸杞一無所知的英國人逐漸瞭解：原來小小枸杞中的維他命C含量比柳橙高、貝他胡蘿蔔素（β-Carotene）含量比胡蘿蔔高、鐵含量比牛排還高！除了豐富的營養元素以外，枸杞所引起的壯陽功能更令西方人難以置信。精明的英國商家索性將枸杞稱為「水果偉哥」

卡地夫大學醫院飲食專家洛登指出：枸杞畢竟不是靈丹妙藥，但枸杞中所含的胡蘿蔔素及多種維他命，能有效預防心臟病和癌症。洛登還表示：健康生活需要多方面的關注，但每天吃點枸杞，的確不失為一種保健良方。

出處：英國廣播公司中文網（BBC Chinese Net）

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

枸杞明目玉露

枸杞明目玉露

- 材料：枸杞、白米、冰糖。
- 步驟：

1. 白米半杯加水，用果汁機打成汁，用篩網過濾，將殘留的渣，再加入水，繼續用果汁機打成汁，反覆幾次，直到完全通過篩網。
2. 枸杞20兩加水，用果汁機打成汁，步驟同1。
3. 將水煮沸，緩慢倒入白米汁，攪拌均勻後，再慢慢的加入枸杞汁，再攪拌均勻，最後依個人喜好加入適量的冰糖。

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

明目小偏方

- 熱開水 500 cc
- 枸杞 （3錢、10克）
- 菊花 （2錢、6克）
- 決明子 （3錢、10克）

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杏仁

- 薔薇科(Rosaceae)落葉喬木植物

山杏 (Prunus armeniaca L. var. ansu Maxim.)

西伯利亞杏 (P. sibirica L.) 東北杏 (P.mandshurica)

杏 (P. armeniaca L.)之成熟果仁

- 可分為南杏仁與北杏仁
- 北杏仁比南杏仁稍小

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南杏仁 V.S 北杏仁

	南杏仁	北杏仁
別稱	甜杏仁	苦杏仁
性味	甘平潤肺， 性屬滋養，	苦降溫散， 性屬宣洩，下氣平喘作用較強
適用對象	適用虛證喘咳	宜用於實證喘咳

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

杏仁

- 本草綱目中記載

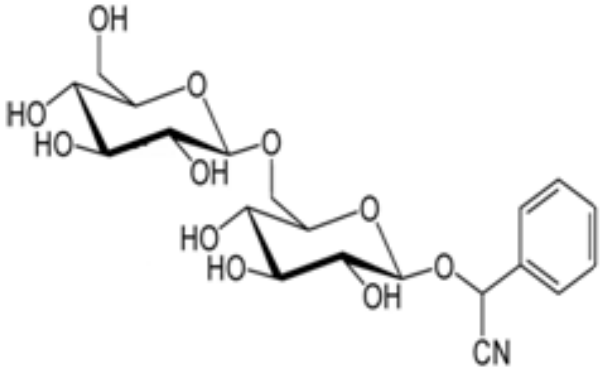
『杏仁性味辛苦甘溫、有小毒，入肺與大腸經。有止咳平喘、潤腸通便之功效。』

- 炮製後可去小毒-燀法、炒法

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

杏仁的有效成分

- 苦杏仁苷(Amygdalin)：
  含氰配醣體(Cyanophore Glycosider)
- 苦杏仁油



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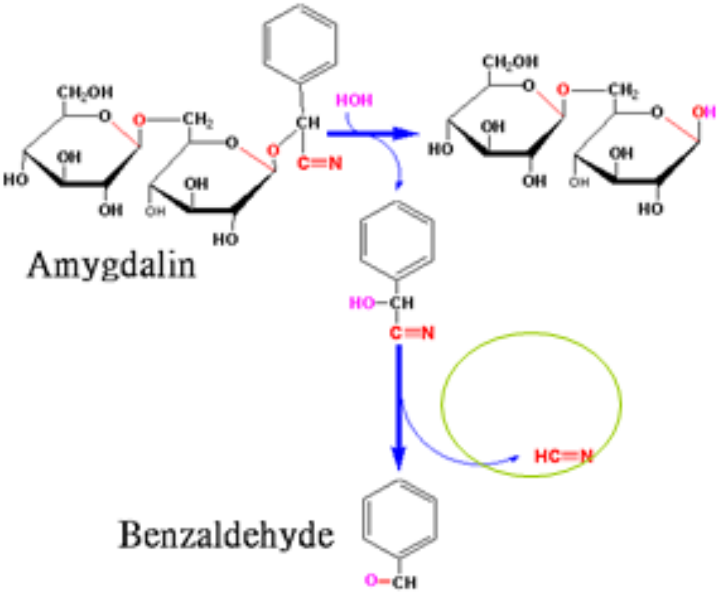
苦杏仁苷水解



楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

補益止咳杏仁玉露

【材料】

苦杏仁去皮尖40克

有機米半杯

冰糖適量

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

補益止咳杏仁玉露

【作法】

1. 將米洗淨，浸泡於清水中。
2. 苦杏仁去皮尖洗淨浸泡於清水中。
3. 分別將米及苦杏仁個別加水放入果汁機中，打成均勻之細漿。（可用網杓過濾，大粒者倒入果汁機中重新再打勻為止）。
4. 4杯水煮開之後，緩緩加入3.之米漿攪均勻後，再徐徐加入4.之杏仁漿攪拌均勻後，改用小火悶煮十分鐘後，再加入適量之冰糖即可趁熱食用。

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補益止咳杏仁玉露

【說明】

有機米具有健胃益脾之功效，杏仁味苦，性溫入肺，有下氣止咳之效。

正值入秋或寒冬之際趁熱喝下會出汗，尚具有祛寒之效。

杏仁致死量

- 1g杏仁約可產生2.5 mg 氫氰酸，口服氫氰酸致死量約50mg
- 成人40~60粒
- 小孩10~20粒
- 常用量3~10g

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

清熱小米玉露

- 材料：綠豆半斤、小米半杯、有機蓬萊米半杯、冰糖適量。
- 說明：小米具補脾腎、清熱解毒、利腸胃之功效，綠豆種子具豐富蛋白質且易被人體消化吸收，大量食用後不會產生脹氣。綠豆芽則含豐富維他命C及礦物質，經常食用，可降低高血壓及膽固醇，尤其維他命B17，為乾種子之30倍之多，多食可預防癌症。且綠豆屬可清熱解毒中藥，其解毒部分為外殼，應此宜帶綠色的外殼同食，米有補中益氣，兩者配佐是一道十分好的清熱甜點。

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

黑芝麻

- 中名：黑芝麻
- 學名：Sesamum indicum DC.
- 科名：胡麻科Pedaliaceae
- 別名：黑脂麻. 烏麻子. 油麻. 小胡麻. 交麻.
- 用部：種子。
- 性味：味甘. 性平
- 功效：入肝. 腎二經. 潤五臟之功效.

用於肝腎不足. 虛風眩暈. 耳鳴. 頭痛. 大便燥結. 病後虛弱. 鬚髮早白. 婦人乳少.

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

黑芝麻

- 成分:含蛋白質.脂肪.糖.纖維素.鈣.磷.鐵.磷脂.維生素B2.維生素E.和卵磷脂.菸酸.葉酸.芝麻素.芝麻林素.芝麻酚等.
- 現代醫藥學研究表明，黑芝麻中的維生素E非常豐富，對維持血管壁的彈性作用巨大。另外，黑芝麻中還含有豐富的α—亞麻酸，也能降低血壓、防止血栓形成。
- 黑芝麻的鈣含量很高，其補鈣效果優於白芝麻數倍。素食者和不愛喝牛奶的人，可以一天吃三匙黑芝麻來補充鈣質。
- 腦力工作者更要多吃黑芝麻，因為芝麻中含卵磷脂，在日常飲食中補充卵磷脂能增強智力的敏銳度——有助增強專注力和記憶力。
- 黑芝麻含鈣量是牛奶的十八倍，因此可預防骨質疏鬆症。

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

防癌小米黑玉露

- 材料：黑芝麻40克、小米半杯、有機蓬萊米半杯、薏仁10克、枸杞子20克、冰糖適量。
- 說明：小米具補脾腎、清熱解毒、利腸胃之功效，本玉露色澤特殊，味道香醇，具有滋陰補腎防癌補中益氣及對骨質疏鬆者之鈣質補充有所幫助。若不喜吃甜者可不加冰糖。枸杞子含豐富之β-胡蘿素為保眼之維他命A之前驅物質，並含人體所需之各種氨基酸易吸收同時有滋陰補腎作用，對住亞熱帶怕躁之人士最適宜之補品
- 薏仁中含有抗腫瘤的薏仁脂。米能補易氣，黑芝麻含有豐富之亞麻油酸及植物性鈣質成分，為吃素者最好之鈣補充食品。

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

吃補的目標

- **什麼時候需要「補」？**
- **怎樣「補」才能符合人體健康之需求？**
- 一、**養生之食**：平常健康的人為求更健康，注意每日攝取之飲食，以能達到保健、預防之目的。
- 二、**食療之食**：生病初期時，根據疾病之病況，配供以食物藥膳，以達早日康復之目的。
- 三、**藥補之食**：生病後，在恢復期擬借用中藥湯液以治病。服之即可加速恢復健康之目的。

楊玲玲 中國醫藥大學附設醫院中醫藥學術副院長

Thanks for your attention.

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