



# Glutinous Rice Economy and Sustainable Production



Consultative Meeting on Cooperative Research and Networking on Food Security and Nutritional Security in GMS  
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hosted by Kasetsart University Chalmprakiet Sakon Nakhon Province Campus  
(KU. CSC)



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# Outline



1. Introduction
2. Glutinous Rice Production and Consumption in Thailand
3. Thai Glutinous Rice Export and International Trade
4. Challenges



# 1. Introduction



# 1.1 Glutinous Rice in Ancient Time

- A discover of rice grain and husk at Non-Nog Tha in Korat Plateau and a cave in Mae Hongson near Thai-Mynmar border, including some areas in Laos PDR and China, were a pre-historical evidence of the glutinous rice cultivation in ancient time and can trace back to more than 5 thousand years.



- It was believed that glutinous rice has long been a major rice grain cultivation in Southeast Asia before the Indian originated non-glutinous rice came to replace as a trading commodity in the region.

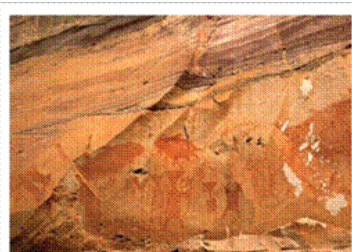
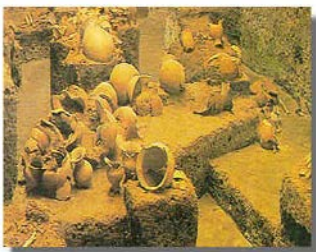


image: from google.com

# 1.1 (continued)

- Glutinous rice is distinguished from non-glutinous rice by having negligible amounts of amylose, and high amounts of amylopectin. Amylopectin is responsible for the sticky quality of glutinous rice.
- Thailand and Laos PDR are two major sticky rice producing countries in Southeast Asia. Other countries in ASEAN have very little areas for sticky rice production.

Countries	Area(mil. ha)	Production (mil. ton)	Yield ton/ha)
Thailand1/	<b>2.91 (4.9%)</b>	<b>6.44(7.2%)</b>	<b>2.21</b>
Laos PDR2/	<b>0.86(12.7%)</b>	<b>3.02(15.2%)</b>	<b>3.51</b>
Others	<b>na</b>	<b>na</b>	<b>na</b>

Source: 1/ OAE; 2/ Office of Foreign Trade Promotion, Vientian referred in Orawan Srisomphun, 2012.

Note: in blanket represent second season crop.

- Laos PDR has been recognized as a center for glutinous rice biodiversity.



## 2. Glutinous Rice Production and Consumption in Thailand



## 2.1 Glutinous Rice Production

- In Thailand, the share of glutinous rice (GR) area is around 19.6% of the country rice planted area.
- The GR production significantly improved in the past few decades, despite a planted area stagnated. This may stem from an increasing adoption of non-photosensitive GR.

Period	Planted area	%Change	Production	%Change
	(million ha)		(million Ton)	
1989-1992	2.94	-	5.40	-
2008-2012	2.91	-1.02	6.44	19.26

Source: OAE

- The largest growing region of glutinous rice is in Northeast (84%) and the second largest is in the north (15%).
- Annual average production of sticky rice was around 4 million ton of milled rice or about 17.5% of total production.

## 2.1 (continued)

- Glutinous rice is mostly grown in rain-fed production environment. Poor soil fertility and subsistent farming in the Northeast has contributed to low yield and high production cost.

- ✓ Average costs of glutinous rice production in 2011 and 2012

Items	2011	2012
Variable cost	19,304	20,615
Fixed cost	3,804	4,307
Total cost/ha	23,108	24,922
Average cost/ton	10,600	10,789
Yield/ha	2.18	2.31

## 2.1 (continued)

- Small farm households(HH) still keep their owned produce for HH food security. The common local varieties found in Northeast and upper north are RD6 and San Patong which are better price and good cooking quality. Non-photosensitive varieties are commonly found in many irrigated areas.
- Glutinous upland rice, particularly Kaow Kum(purple rice) and Kaow Luem Phoa is now consider to be a high premium rice due to rich antioxidant and anthocyanin. As a result, these varieties can create a specific value in a niche market



## 2.2 Utilization of Glutinous Rice for Domestic Use

- About 90% of glutinous rice (GR) production is for domestic use. A direct consumption is about four-fifth of the total domestic use. Industry use for flour shares very small. Households in NE and Upper N consumed glutinous rice as a daily diet. But for Thai in general consumes as sweet dessert.



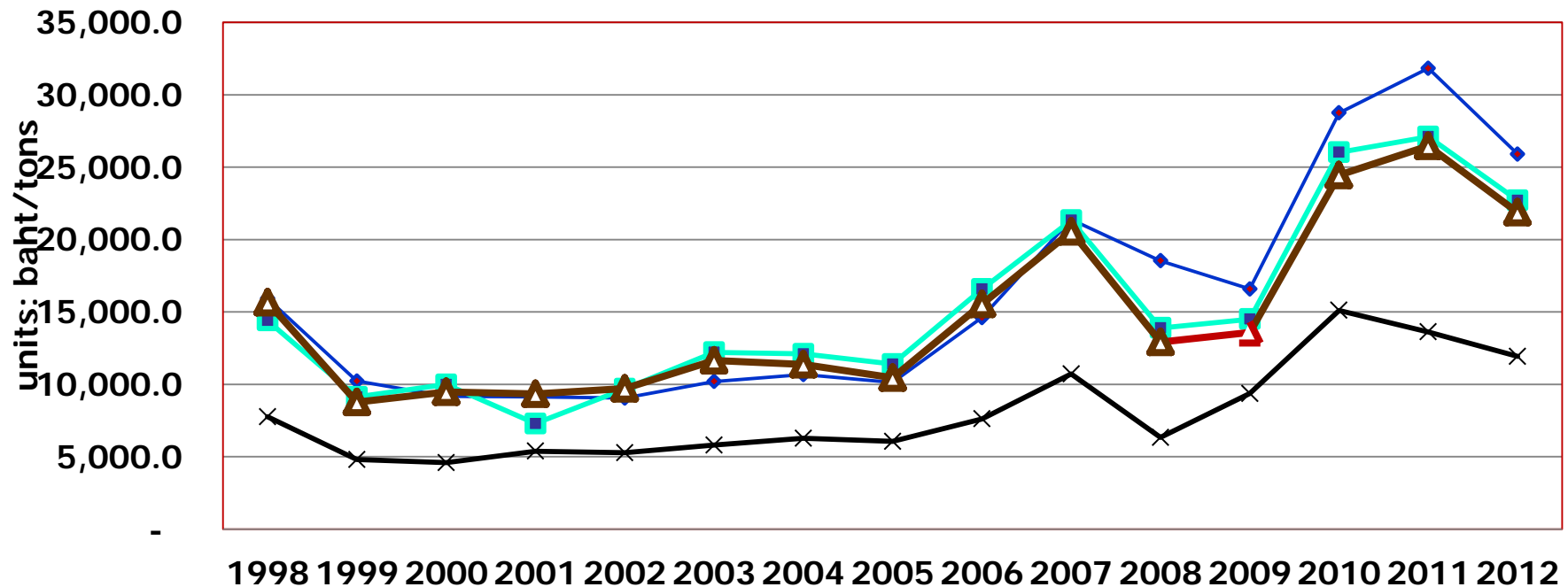
- Average per capita consumption of non-glutinous and glutinous rice in 2011 was at 90 kg/head/year. And a share of glutinous rice in HH consumption was 15 kg or 16.7%.

Items	Per capita rice consumption in 2011 (kg/head/year)		
	Non-glutinous	Glutinous	Total
<b>Total</b>	<b>75</b>	<b>15</b>	<b>90</b>

## 2.3 Paddy and Milled Glutinous Rice Price Movements

### ● Domestic and F.O.B Glutinous Rice Price Movements

F.O.B.White Glutinous Rice 10% , wholesales and Retail prices

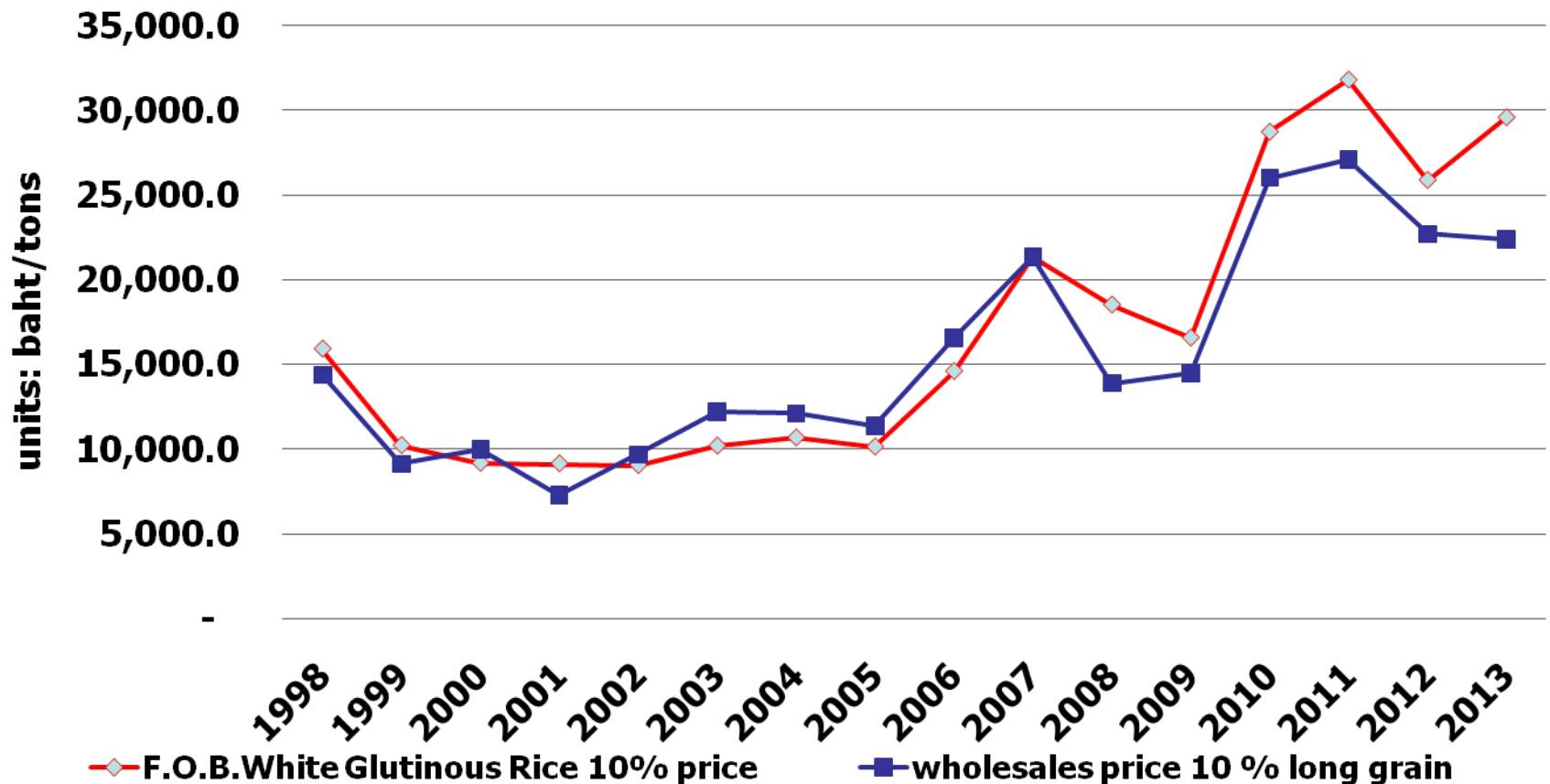


- ◆— F.O.B.White Glutinous Rice 10% price
- wholesales price 10 % long grain
- ▲— wholesales price 10 % short grain
- ×— Glutinous farm price

Source: Farm price from OAE; Wholesale price from Department of Internal Trade; and FOB price from Thailand Board of Trade

## 2.3 Paddy and Milled Glutinous Rice Price Movements

● F.O.B. Prices of White Glutinous Rice 10% and Glutinous Rice Wholesale Price Relationship





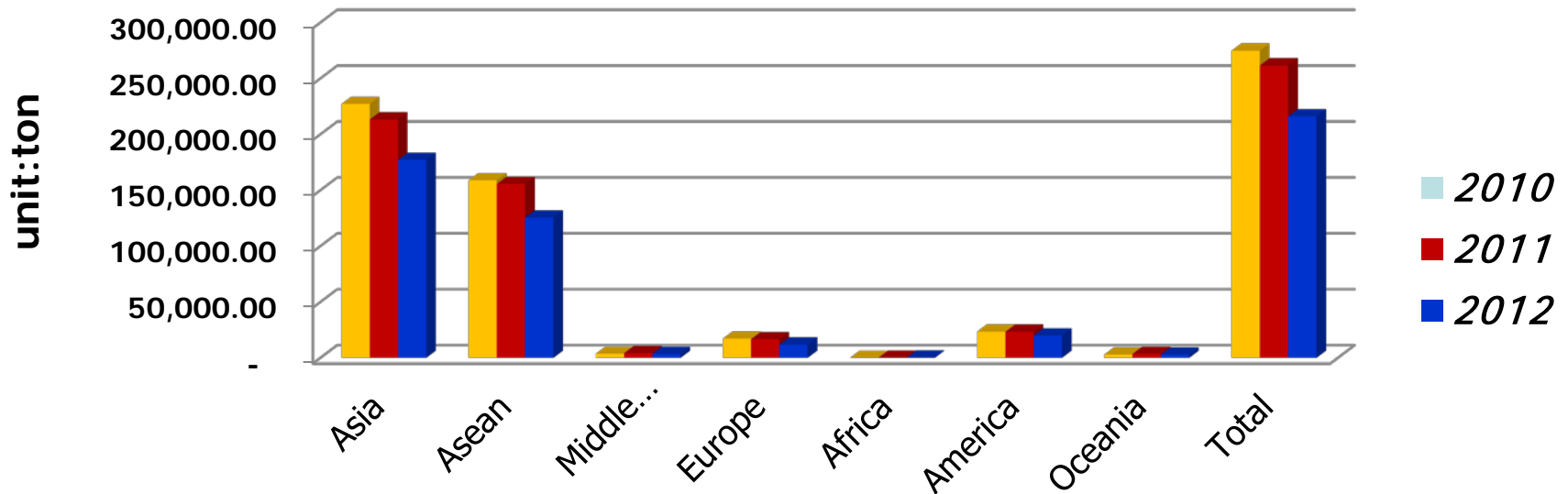
### 3. Thai Glutinous Rice Export and International Trade



## 3.1 Export of Thai Glutinous Rice

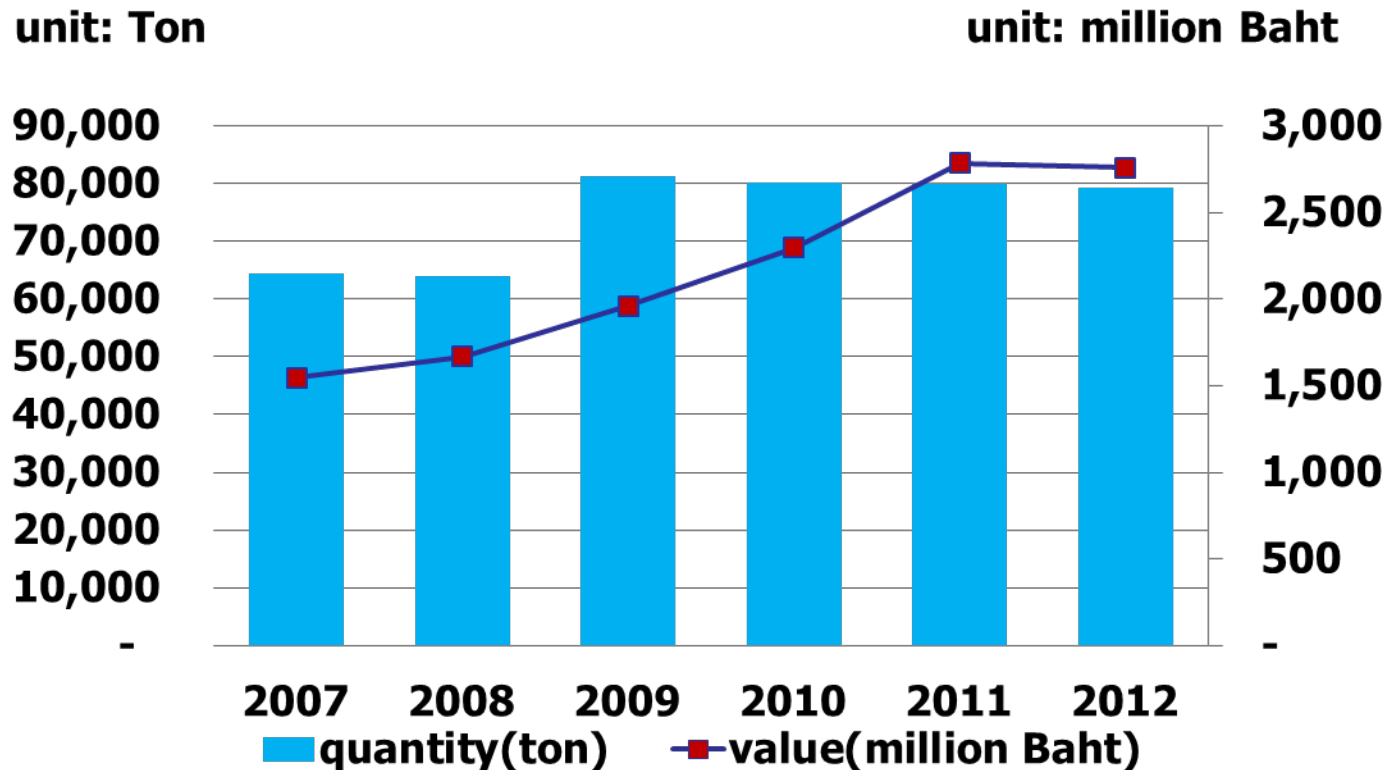
- Approximately less than 10% of annual GR production is utilized for export as milled rice.
- Data in 2012 showed that the export of milled glutinous rice is around 0.23 million ton. However, the export amount was not stable but declining since 2010

Milled Glutinous Rice Export from 2010-2012



## 3.2 Export of Thai Glutinous Rice Flour

### ● Glutinous Rice Flour Export during 2007-2012



Source: Data obtained from Office of Agricultural Economic



Image: from google.com

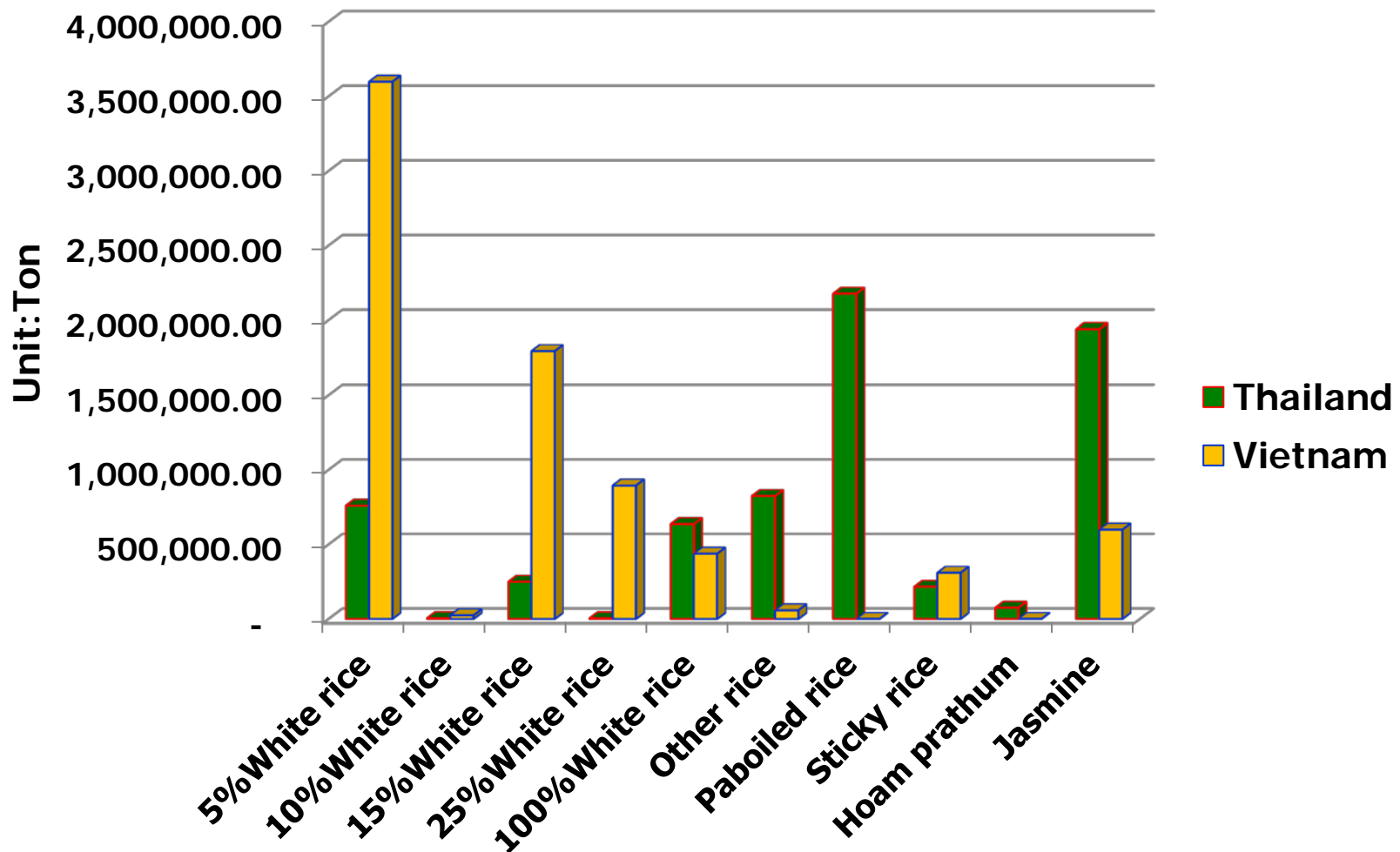
## 3.3 Major exporters and Importers in the International Market

➔ Major exporters of glutinous rice were Thailand and Vietnam but major importers were Korea and Japan.

Export Countries	%share	Import Countries	%share
Thailand	89.60	Korea	33.03
Vietnam	9.82	Japan	15.93
Japan	0.22	Hongkong	10.78
Pakistan	0.18	Liberia	7.98
Others	0.17	Others	32.28
Total	100.0	Total	100.00
Total in Value(mil.US\$)	227.31	Total in Value (mil.US\$)	273.47

## 3.4 Comparison of Glutinous Rice and Other Rice Exports between Thailand and Vietnam

### ● Thailand and Vietnam Rice Exports by Type of Rice, 2012

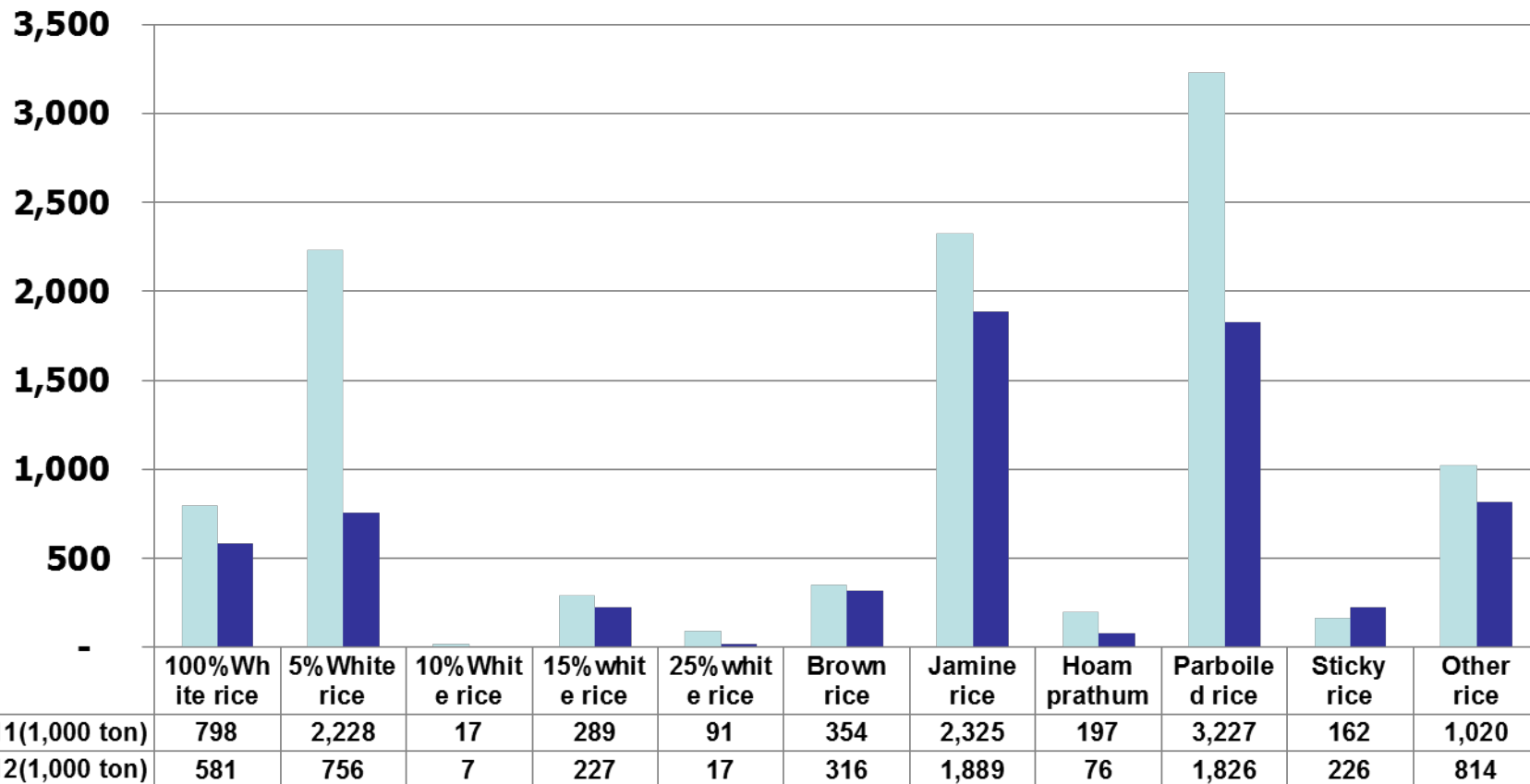


Source: Data obtained from Thailand Board of Trade

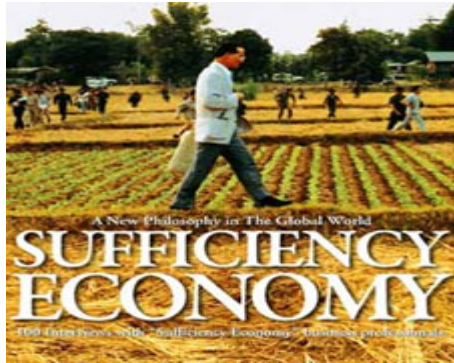
## 3.4 Export of Glutinous Rice and Others in 2011 and 2012

✓ Total export in 2011=10.71 million ton

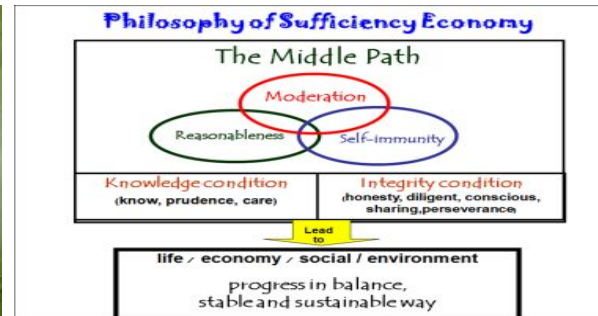
✓ Total export in 2012=6.73 million ton



Source: Data obtained from Thailand Board of Trade



## 4. Challenges



## 4.1 Threats to Rice Field Ecosystem and Biodiversity

- Traditional rice systems have long been environmentally sustainable and has long associated with ecosystems. The rice-field ecosystem is a living place for aquatic habitats, insects as well as various aquatic and free standing plants.
- Recent wide spread of rice intensification practices posted threats to a loss of rice-associated biodiversity as well as a damage on livelihood, nutrition and food security of rural communities.
- The excessive use of agrochemicals in recent years under rice intensification is widely recognized as a major source of air, water and soil pollution which consequently affect on natural food chains and farmers' health.

## 4.2 Options Toward Sustainable Rice Production

- A sustainable production is a long-term concept which aims to meet human needs in the present while preserving the environment so that these needs can also be met in the indefinite future.
- Given the negative externalities associated with modern rice intensification, an alternative solution is to revert back to more environmental friendly production such as organic rice production.
- A specific value of organic rice creates a niche product which consumers are willing to pay at a higher price.
- Sufficiency economy practice and integrated farming practices around rice cultivation are other options which yield high livelihood and environmental benefits to farmers.<sup>21</sup>

## 4.3 Policy Driven

### ➔ Capacity building and empowerment

- ✓ Promote and support farmers field school program.
- ✓ Improve farm business management skills for understanding the creation of value chains in production and market systems

### ➔ Financial incentive program for farm restructure toward environment benefit practices.

- ✓ Provide low interest rate farm credit incentive to farm households and communities who needs to adopt rice associated environmental benefit practices.
- ✓ Setting up agriculture sustainability fund for those who restructure toward the ecological sustainability practices. <sup>22</sup>

## 4.3 (continued)

### ➔ Develop and enhance agricultural environmental friendly product markets

- ✓ Provide incentive for community and cooperative networking programs for integrated supply chain management from upstream to downstream markets

### ➔ Subsidize program for bio-inputs markets

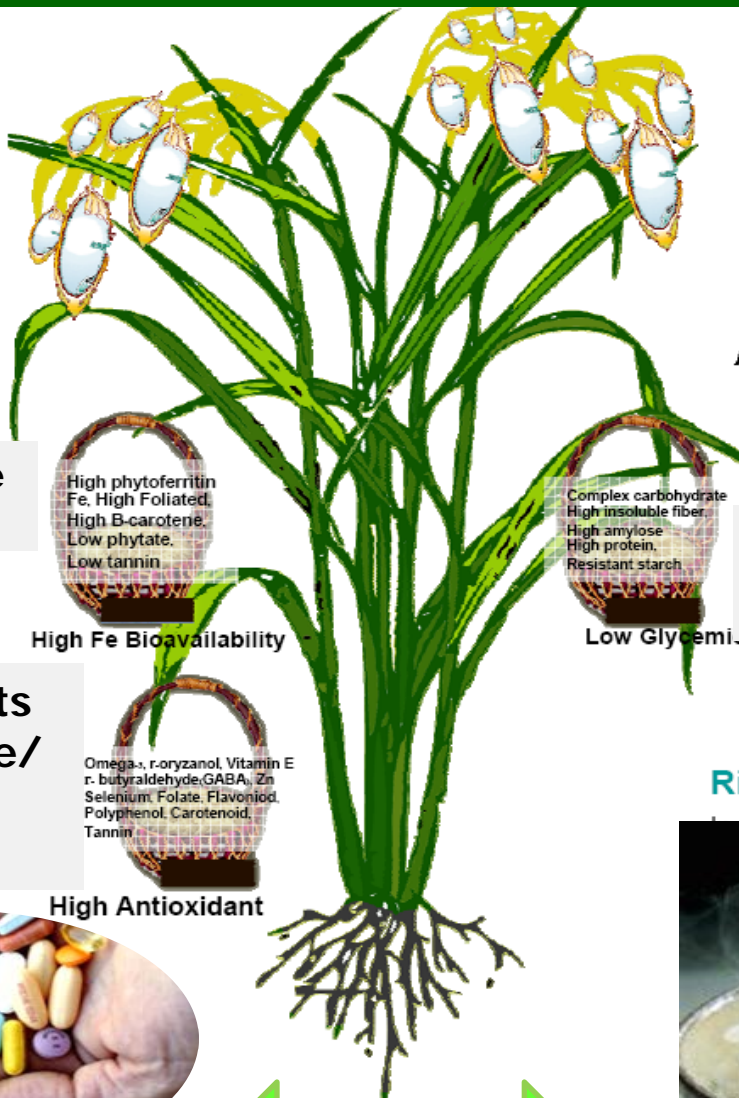
- ✓ Promote the use of bio-inputs in rice production by subsidizing the bio-input markets.

### ➔ Enhance R&D for environmental friendly techniques and value chains creation

- ✓ Create innovative techniques for cost effectiveness and quality enhancement for the niche market.
- ✓ Create medicinal value beside the staple food value.

# 4.3 (continued)

✓ Let Your Rice be Your Medicine



Iron and high Fe bioavailability

- High phytoferritin
- Fe. High Foliated.
- High B-carotene.
- Low phytate.
- Low tannin

High Fe Bioavailability

- Complex carbohydrate
- High insoluble fiber.
- High amylose
- High protein.
- Resistant starch

Low Glycemic

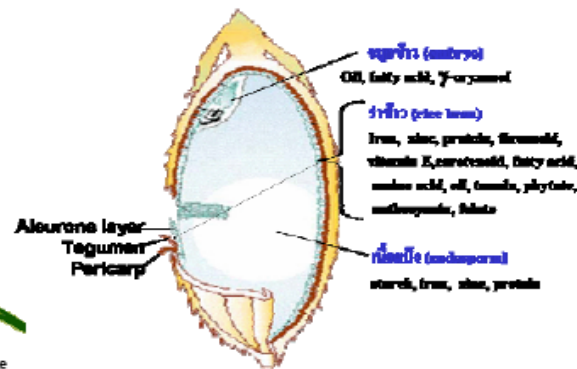
High Antioxidants  
Selenium/ Folate/  
Phytonutrients  
(สารพฤกษเคมี)

- Omega-3, r-oryzanol, Vitamin E
- r. butyraldehyde, GABA, Zn
- Selenium, Folate, Flavonoid,
- Polyphenol, Carotenoid,
- Tannin

High Antioxidant



Grain for Life: นวัตกรรมพันธุ์ข้าวที่มอบคุณค่า  
สารอาหารและคุณค่าทางโภชนาการ  
Composition rice grain



Low – medium  
glycemic index

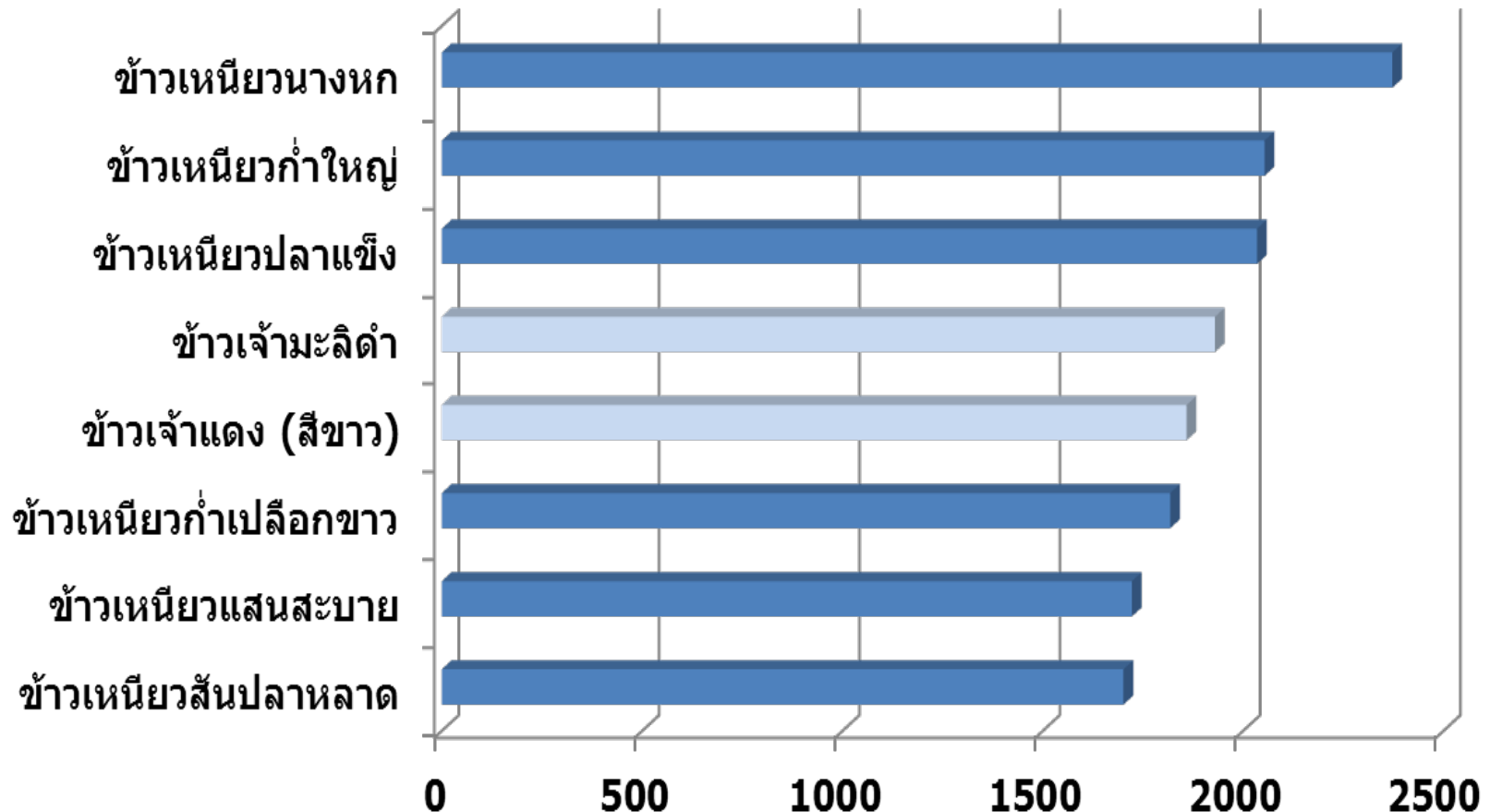
Rice for Nutrition



## 4.3 (continued)

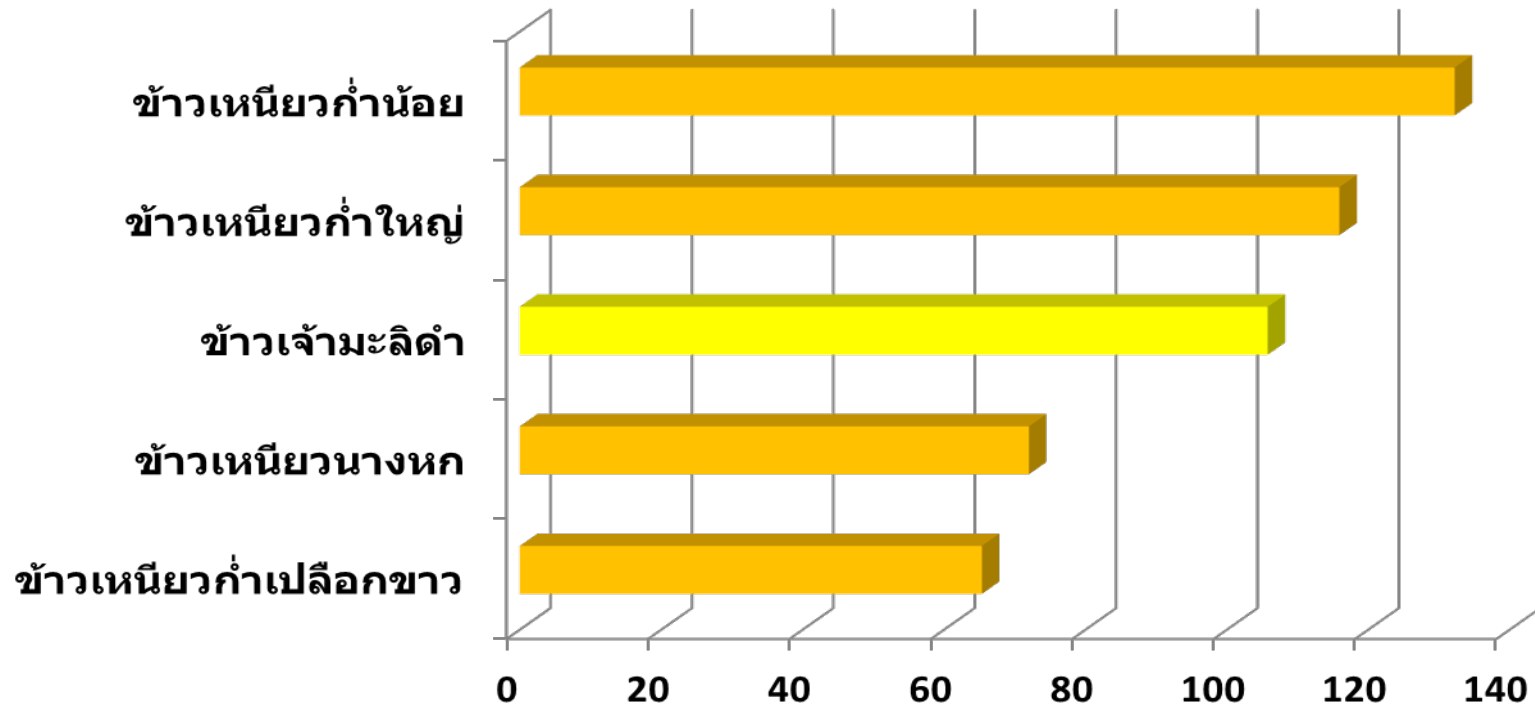
### ✓ Vitamin E found in some glutinous and non-glutinous rice

วิตามิน อี (แกมมาโทโคไตรอีนอล; ไมโครกรัม/100 ข้าวดิบ)

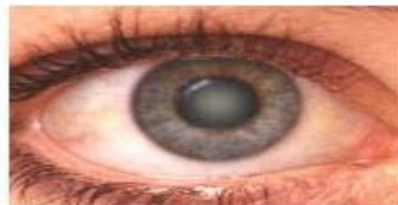


## 4.3 (continued)

✓ Lutein found in some glutinous and non-glutinous rice  
 จูทีน (ไมโครกรัม/100 กรัมดิบ)



เลนส์ตาใส



เลนส์ตาขุ่น

บทบาทในการป้องกันการทำลายเรตินาด้วยการเป็นสารต้านออกซิเดชั่น ดังนั้นจึงลดปัจจัยเสี่ยงการเกิดโรคตาบอดอันเนื่องมาจากการเสื่อมสภาพของแมคคูลา ลูทีนในผู้สูงอายุ หรือโรคต้อกระจก

A scenic view of a rice field with a wooden house and mountains in the background. The foreground shows a lush green rice paddy with a small tree branch on the left. The middle ground features a wooden house with a thatched roof, surrounded by trees. The background shows rolling hills and mountains under a cloudy sky.

**Thank you**

**Q&A**