



PROCEEDINGS OF THE WEBINAR:

Kanin ng Pinas **MAS MAINAM BA AT LIGTAS?**

November 27, 2020

DEPARTMENT OF AGRICULTURE
PHILRICE
PHILIPPINE RICE RESEARCH INSTITUTE



rationale



The Rice Trade Liberalization (RTL) Law, implemented in March 2019, liberalized the importation, exportation, and trading of rice in the Philippines. This is in line with our long overdue commitment to the World Trade Organization (WTO) since 1995. The transition to a new rice trade system posed challenges to local rice farmers with the intensified competition. The deregulation of rice imports invited traders to import rice instead of procuring and processing paddy from local rice farmers given that consumers are more likely to avail of the cheaper imported rice. By September 2019, almost 2 million MT of imported rice arrived in the country. The increase in rice supply led to the gradual fall in rice prices to the benefit of consumers, while farmgate price level dropped especially during peak harvest months, hence the clamor among rice farmers.

RTL law provides the P10 billion Rice Competitiveness Enhancement Fund (RCEF) allocated annually for the next six years to help farmers become competitive. Specifically, it will be used to provide certified inbred rice seeds, machineries, extension services, and credit to rice farmers to enhance their yield and reduce their production cost. The Department of Agriculture's (DA) National Rice Program (NRP) and the recent Rice Resiliency Project (RRP) under the Plant. Plant. Program are also in place to boost production and raise the country's rice self-sufficiency level. Complementary

to this, the DA and the Philippine Rice Research Institute (PhilRice) initiated the *"Grow Local. Buy Local. Eat Local. #SupportOurRiceFarmers"* campaign in celebration of the 2020 National Rice Awareness Month to provide a more holistic intervention to uplift rice farmers amidst the new rice trade regime.

The campaign partly aims to encourage consumers to patronize locally produced rice to support and motivate our rice farmers to continue producing rice. For this purpose, it is important to raise consumer awareness about the advantages of locally produced rice over imported rice, and acquaint them about the distinct characteristics of several known rice varieties planted in the country. The campaign also pushes for truthful labeling based on the prescribed labeling of rice boxes and price tags provided in the Philippine National Standard on Grains Grading and Classification of Paddy and Milled Rice to help consumers distinguish local from imported rice. In this context, the Science-based Policies in Advancing Rice Communities (SPARC) Program of PhilRice conducted a webinar for consumers that focuses on the characteristics of locally produced rice to spur demand for the commodity. Through this, farmers can gain better market and income opportunities by having a sure market for their produce at a reasonable price.

overview

As a food staple, rice accounts for more than 30% of the carbohydrate-rich foods consumed by Filipinos. It also serves as a major source of income for residents in rural communities and for value chain actors. This makes it a politically and economically important crop in the Philippines. The enactment of the RTL law in 2019 increased consumer's options on the type, and particularly on the source of rice. This presentation thus sought to answer whether locally produced rice has better quality, and is safer than imported rice for consumers' guidance. The quality of rice is measured using different indicators like milling quality, physical grain attributes, physicochemical properties, cooking parameters, and eating and nutritional quality. There is a diverse variety of locally produced and imported rice that are available and accessible in the country especially since rice importation has been liberalized. These varieties differ in each measure of quality, hence, locally produced rice cannot be conclusively regarded as generally

superior over imported rice. Although in terms of safety, locally produced rice has been proven to not contain heavy metals that may harm consumers' well-being. Less pesticides are also used in locally produced rice, thus reducing possible chemical contamination. Furthermore, locally produced rice is guaranteed fresh with shorter storage period relative to imported rice that undergo shipping before coming into the market. The Philippine National Standard (PNS), integrated pest management (IPM), and good agricultural practices (GAP) which local farmers are encouraged to adopt also guarantee consumers with safe locally produced rice. Patronizing locally produced rice does not only ensure safe rice for consumers, but it also enables them to bolster rice farmers amid the intensified market competition. Still, their selection between locally produced and imported rice may still be determined by their priorities, quality preferences, social values, and/or purchasing capacity.



Based from the Department of Health (DOH) and the Philippine Statistics Authority's (PSA) data, cardiovascular diseases (heart and vascular diseases), cancer, and diabetes are the leading causes of mortality in the Philippines.

Unhealthy Lifestyle

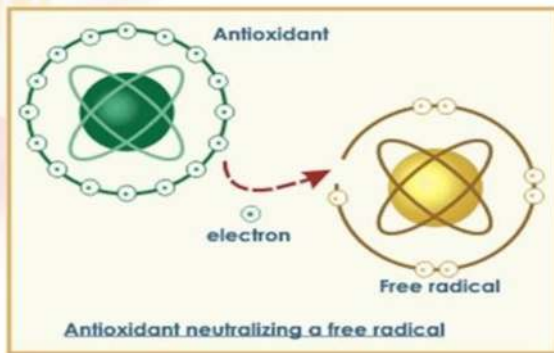


is the leading cause of **disease...death**

Icons source: Freepik

One of the biggest contributing factors to the onset of diseases is unhealthy lifestyle, which involves smoking, drinking, sedentary lifestyle, stress, and unbalanced daily diet.

Antioxidants

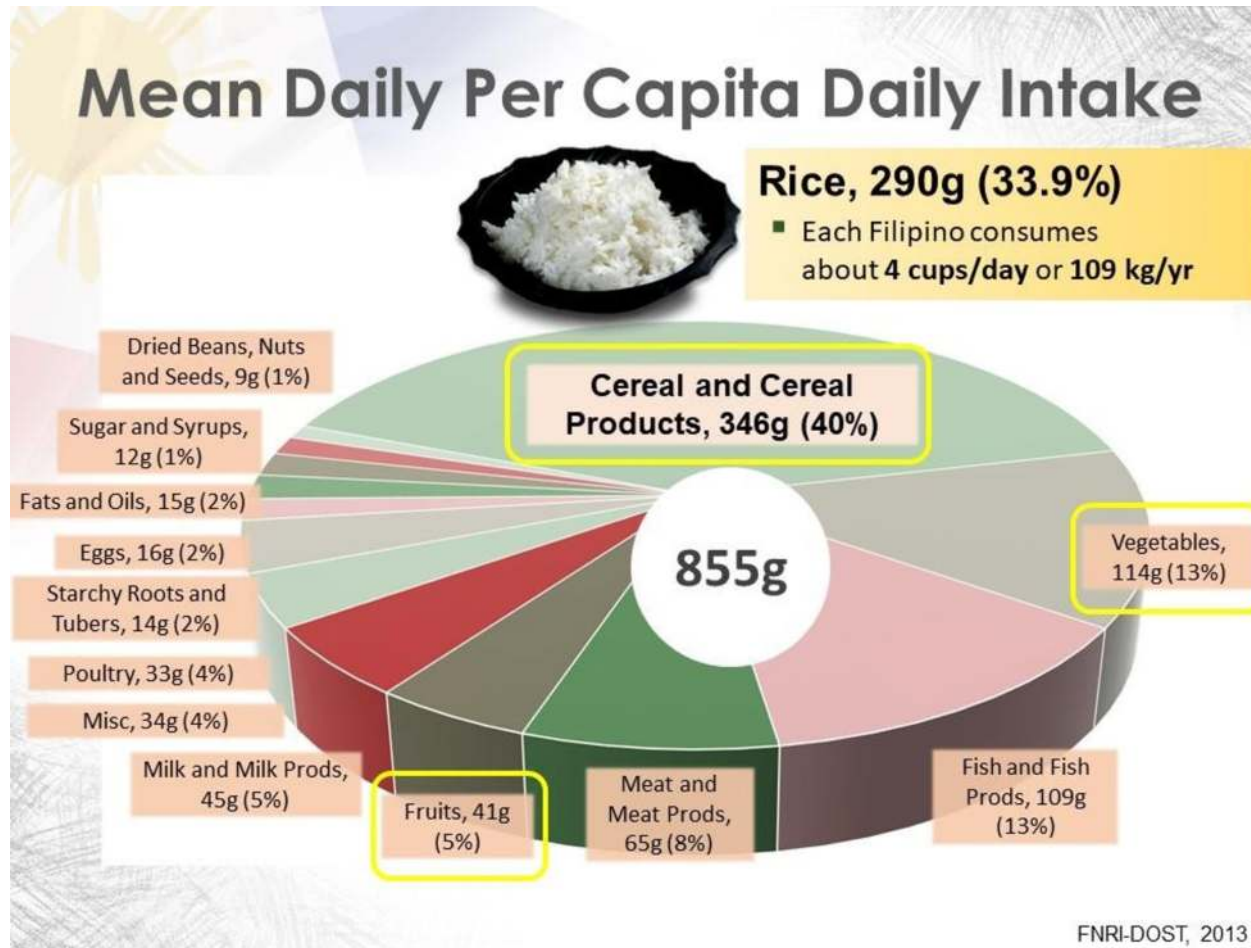


Substances that prevent or slow down the oxidation process

Can remove radical intermediates that prevent or slow down the oxidation process



We are encouraged to consume a balanced and diversified diet filled with antioxidants, as these help the body fight free radicals that cause non-communicable diseases.



Forty percent of our diet is composed of carbohydrates. Rice accounts for more than 30% of the carbohydrate-rich foods consumed by Filipinos given that it is their staple food. That is, it is eaten for breakfast, lunch, and dinner. Filipinos even love to consume rice-based products (e.g. kakanin, lugaw) as *merienda*, hence being regarded as certified rice-loving people by Dr. Romero. Meanwhile, consumption of antioxidant-rich foods like fruits and vegetables remain low at only 5% and 13%, respectively.



Filipinos love rice as it has been part of their culture and makes the concept of a complete meal. Hence, it has been their staple food. It is an important crop not only in the Philippines, but also globally. It is also a major source of income for rice value chain actors.

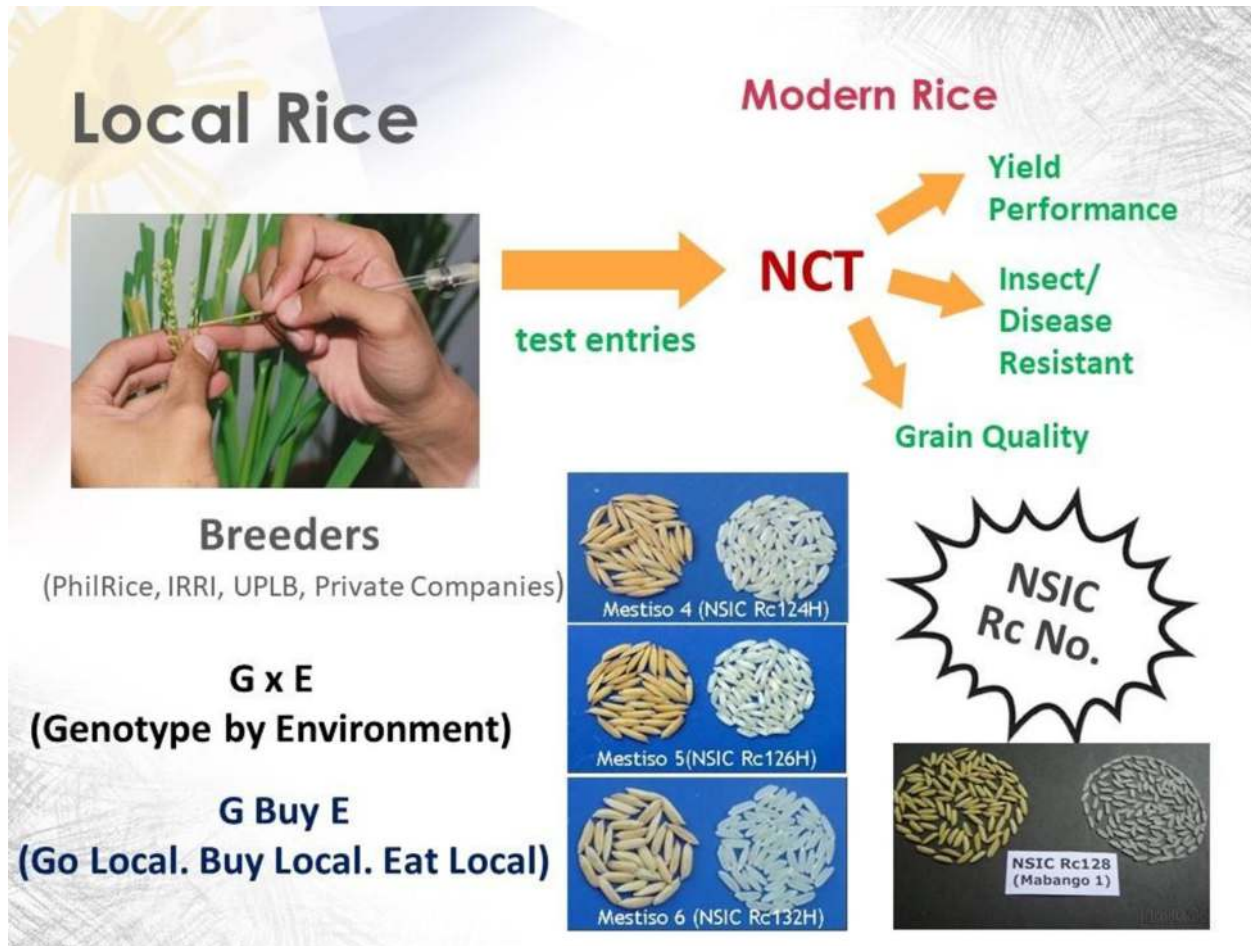


- Most important crop in the Philippines
- Source of income
- Staple food
- Concept of a complete meal
- Part of culture

Picture sources: Freepik & foodforjoyblog



There are two types of local rice in the Philippines. One of these is the traditional rice varieties or varieties that are indigenous in the country. That is, it is originally planted in the country and has been transmitted through generations. There are parts of the country that can claim ownership of a traditional variety like the Cordillera Administrative Region (CAR). In which case, the traditional variety is referred to as heirloom rice which is the original variety planted in a certain area. These varieties are still planted for its aroma and taste.



Aside from traditional varieties, there are now modern rice varieties developed by rice breeders like the Philippine Rice Research Institute (PhilRice), International Rice Research Institute (IRRI), University of the Philippines Los Baños (UPLB), and private companies. These varieties are assessed through national cooperative testing. Seed varieties that pass the assessment are then labeled with the National Seed industry Council's (NSIC) name under the Bureau of Plant Industry (DA-BPI).

Breeders always consider genotype by environment (GxE) when breeding rice which fits the 2020 NRAM campaign "Go Local. Buy Local. Eat Local." (G Buy E).

How long does it take to develop a rice variety?

~10,000 at the
PhilRice Genebank

- High yield
- Pest and disease resistance
- Good grain quality

Breeding to Commercial Release

It takes about 10 to 12 years to develop a rice variety. Over the years, PhilRice has collected about 10,000 different types of seeds composed of high-yielding and pest and disease-resistant seed varieties. There are also seed varieties that produce good grain quality.



Local Rice Better quality?

The first objective of this presentation is to answer whether locally produced rice is better than imported rice in terms of quality.

Grain Quality Evaluation

Milling Potential

- % Brown Rice
- % Total Milled Rice
- % Head Rice

Physical Attributes

- Grain Size
- Grain Shape
- Chalky Grains
- Immature Grains

Physicochemical Properties

- Moisture
- Crude Protein
- Apparent Amylose
- Gelatinization Temperature
- Gel Consistency

Cooking Parameters

- Optimum Cooking Water
- Optimum Cooking Time
- Volume Expansion

Sensory Attributes

- Laboratory Panel
- Consumer Panel

Alternative Methods

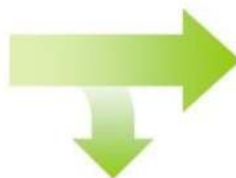
- Near Infrared Transmittance Spectroscopy (NIT)
- Gas Chromatography (GC)
- Tensipresser
- Rapid Visco-Analyzer (RVA)

We must be careful in comparing grain quality as there are different measures of quality in rice. These include milling potential, physical grain attributes, physicochemical properties, cooking parameters, and sensory attributes.

Milling Quality



rough rice



brown rice



hull

Even though Filipinos eat rice everyday, most of us do not know the basic structure of rice. Rough rice refers to grains with the hull or "*ipa*" still intact. Once removed through milling, the rice is then called as brown rice.

Milling Quality



brown rice



white/milled rice



rice bran

Brown rice is then further milled to remove the bran or "*darak*", turning it into polished/milled rice.

Milling Quality



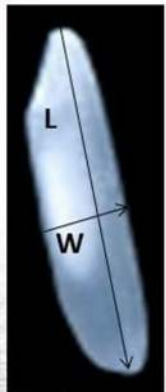
After milling, brown and milled rice are classified based on the milling degree and quality determined by the recommended values.

MR	Recommended Value
% Brown Rice	75.0% and above (Fair to Good)
% Total Milled Rice	65.1% and above (Grade 1 to Premium)
% Head Rice	48.0% and above (Grade 1 to Premium)

Physical Quality

Grain Length and Shape

- Measure under photo-enlarger the length and width of 10 whole milled grains
- Caliper



- **Grain Length (in mm)**

- Extra Long ≥ 7.5
- Long 6.6 – 7.4
- Medium 5.5 – 6.5
- Short ≤ 5.4

- **Grain Shape (L/W in mm)**

- Slender > 3.0
- Intermediate 2.0 – 3.0
- Bold < 2.0



Physical quality refers to the physical characteristics of the grains usually assessed visually. This includes grain length (short, medium, long, extra long), and shape (bold, intermediate, slender).

Physical Quality

Chalky Grains

- White chalky portions

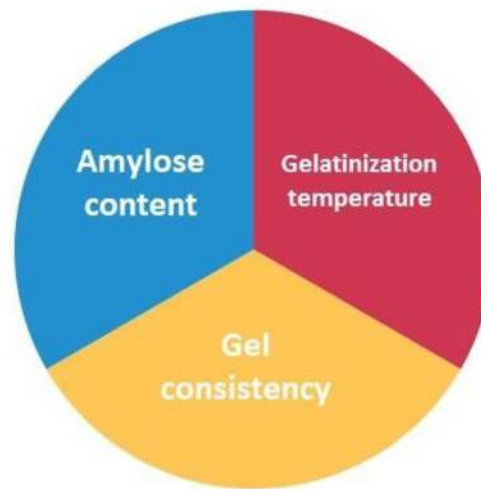
PA	Recommended Value
% Chalky Grains	less than 5.0% (Grade 1 to Premium)



Another physical quality of grains that is assessed is its chalkiness. The lower %chalky grains, the better.

Physicochemical Quality

Indicators of cooking and eating qualities of rice



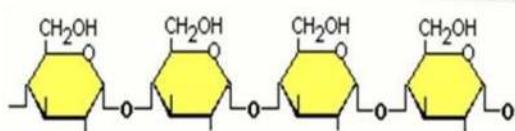
Physicochemical attribute of rice is analyzed in laboratories. This is important because it helps predict the cooking or eating quality of rice.

<http://www.knowledgebank.irri.org/grainQuality/default.htm>

Physicochemical Quality

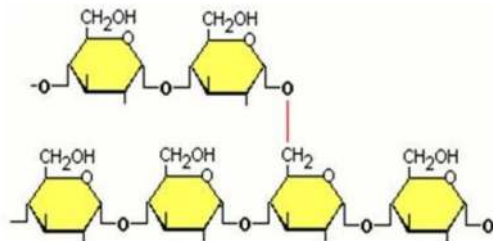
Amylose

- Linear component of starch



Amylopectin

- Branched component of starch



We consume rice as it is a great source of carbohydrate for energy. Starch is the carbohydrate contained in rice. It has two components – amylose and amylopectin. Amylose is a chain of glucose, the linear component of starch. Amylopectin, on the other hand, is the branched component of starch.

Carbohydrates are converted into glucose upon digestion which is why we must moderate our consumption of rice (especially white rice) as this could raise blood sugar levels.



Rice can also be classified based on its amylose content. Waxy rice has almost no amylose. There are also rice with very low amylose content which can usually be found in Japanese and Korean restaurants. Meanwhile, rice with low to intermediate amylose content is the most common in the Philippines. Rice with high amylose content, on the other hand, are usually used in noodles like *bihon*. Lower amylose content means more tender rice.

Physicochemical Quality

Crude Protein

- Kjeldahl method
- About 6-9%






Rice also contains protein (crude protein) measured by the Kjeldahl method. On the average, there is about 6-9% crude protein in rice.

Physicochemical Quality

Gelatinization Temperature

- Predicts the cooking time of rice

Rating	Alkali Spreading Value	GT (°C)	
1	Grain not affected	74.5 – 80.0 High	
2	Grain swollen		
3	Collar incomplete & narrow	70.0 – 74.0 Intermediate	
4	Collar complete & wide		
5	Grain split or segmented		
6	Grain dispersed merging with collar	<70 Low	
7	Grain completely dispersed & intermingled		



High Gelatinization
No Dispersion
(alkali value=2)

Intermediate Gelatinization
Moderate Dispersion
(alkali value=4)

Low Gelatinization
Almost Complete Dispersion
(alkali value=6)

<http://www.knowledgebank.irri.org/grainQuality/default.htm>

The gelatinization temperature determines the cooking time of rice. The higher it is, the longer the cooking time.

Cooking Quality

- Optimum Cooking Water
- Optimum Cooking Time
- Volume Expansion



Cooking quality includes the water requirement, cooking time, and volume expansion of rice.

Sensory Quality

- Raw and cooked rice quality characteristics

Laboratory Panel

Raw Rice: color, aroma, off-odor, gloss, translucency, brittleness

Cooked Rice: color, aroma, off-odor, flavor, tenderness, cohesiveness



Raw and cooked rice also undergo sensory testing to evaluate its quality and characteristics. Raw rice is evaluated based on its color, aroma, off-odor, gloss, translucency, and brittleness. Cooked rice, on the other hand, is tested based on its color, aroma, off-odor, flavor, tenderness, and cohesiveness.

Sensory Quality

- Consumer Panel

Preference Score
% Acceptability



Sensory testing is further done through consumer panel to assess the rice's consumer acceptability based on the preference score from the participants.



Staple Food (White Rice)

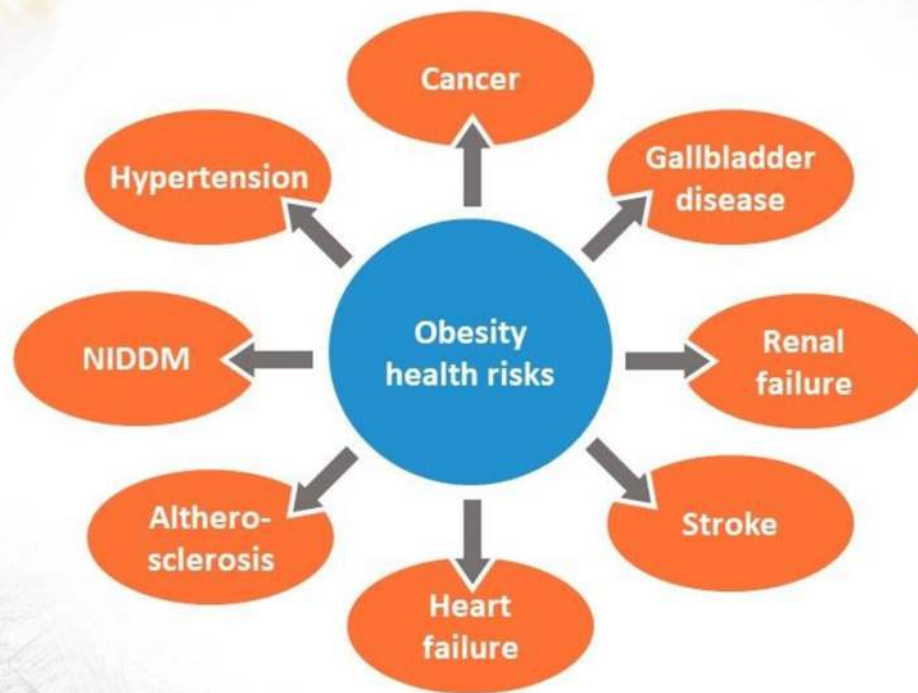
- Each Filipino consumes about 109 kg of white rice/year or 4 cups/day*



- Excellent source of carbohydrates
- Good eating quality (taste, texture)

Each Filipino consumes almost 4 cups of rice a day, on the average. Rice is a good staple food as it is an excellent source of carbohydrates that is good for the brain and muscles. It is also low in fat.

Downside of Rice (eating too much of it)



However, too much consumption of rice (especially white rice) can cause obesity especially if we are not able to expend energy or are not physically active. This could lead to various health risks such as cancer, gallbladder disease, renal failure, stroke, and cardiovascular diseases.

Pinggang Pinoy serves as a guide on proper diet composition. Using a standard size of a plate, rice should be only a little over $\frac{1}{4}$ of the plate. Our diet must always include meat and/or fish, fruits, and vegetables. It must be accompanied by a glass of water instead of softdrinks or any sugary beverages.



Healthier Rice



As an alternative to white rice, there are other types of rice that are considered as "healthier rice".

BROWN RICE

- Unpolished or dehulled whole kernel produced by removing the hull or husk of paddy of rough rice while leaving the bran layer intact
- Pinawa
- Whole grain food (2.9-4.5% dietary fiber)
- Bran, germ, and endosperm
- May prevent the onset or reduce the incidence of cardiovascular disease, cancer, and diabetes



One of the healthier alternative to white rice is brown rice. Any variety can be processed into brown rice by just removing the hull or “ipa” during milling. The remaining bran or “darak” gives the grains its distinct brown color and also contain bulk of the nutrients. Brown rice is considered by the US Food and Drug Administration (USFDA) as a whole grain food. Accordingly, there are studies that assert that consumption of whole grains can lower the risk of chronic diseases.

Macronutrients

Nutrient	Amount per 100 g at 14% moisture	
	Brown Rice	Milled Rice
Energy Content (kcal)	363-385	349-373
Crude Protein (g)	7.1-8.3	5.8-7.1
Crude Fat (g)	1.6-2.8	0.3-0.6
Crude Ash (g)	1.0-1.5	0.3-0.8
Total Dietary Fiber (g)	2.9-4.5	0.7-2.7
Crude Fiber (g)	0.6-1.0	0.2-0.5
Available Carbohydrates (g)	73-87	77-89
Sugars (g)	0.8, 1.4	0.1-0.5

Macronutrients include carbohydrates, protein, and fiber. As seen in the table, brown rice has higher levels of these nutrients, especially dietary fiber, over white rice.

Juliano, 2010

Micronutrients

Nutrient	Amount per 100 g at 14% moisture	
	Brown Rice	Milled Rice
Phytic Acid (g)	0.4-0.9	0.1-0.2
Phosphorus (g)	0.17-0.43	0.08-0.15
Iron (mg)	0.2-5.2	0.2-2.8
Zinc (mg)	0.6-2.8	0.6-2.3
Thiamin (mg)	0.3-0.6	0.02-0.17
Riboflavin (mg)	0.04-0.14	0.02-0.06
Niacin (mg)	3.5-6.2	1.3-2.4
Folate (µg)	16-20	6-9
Vitamin E, α-tocopherol (mg)	0.6-2.5	<0.10-0.30

Juliano, 2010

Likewise, brown rice also has higher levels of micronutrients (Vitamins B1, B2, B6, B12, E, and minerals) than white rice.

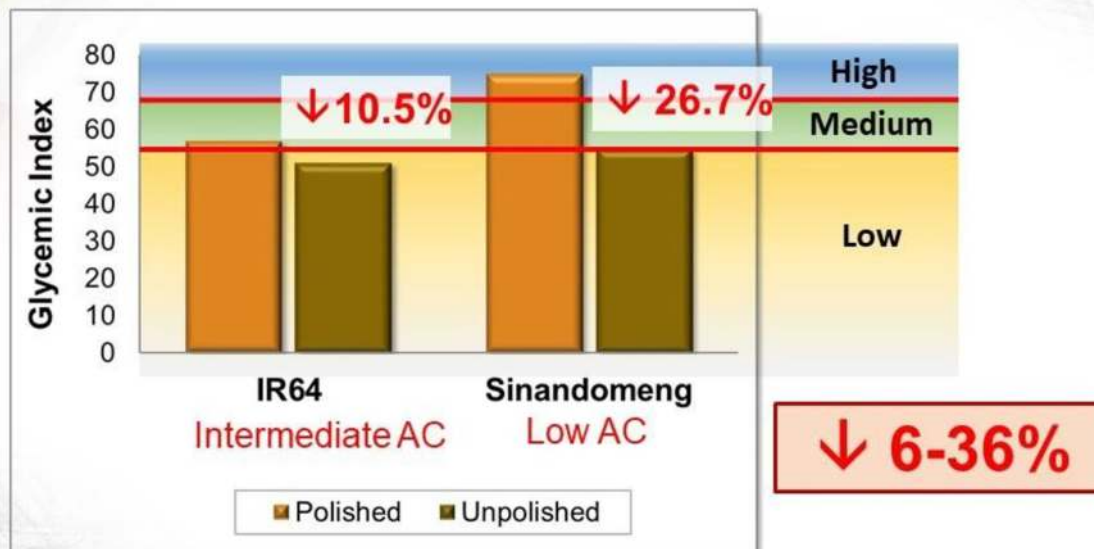
polishing removes:

*15% of protein
85% of fat
80% of thiamine
70% of riboflavin
68% of niacin
90% of calcium
75% of phosphorus
60% of other minerals*



When we mill brown rice into white/polished rice, we are throwing away the nutrients contained in its bran which include 15% of protein, 85% of fat, 80% of thiamine, 70% of riboflavin, 68% of niacin, 90% of calcium, 75% of phosphorus, and 60% of other minerals in rice.

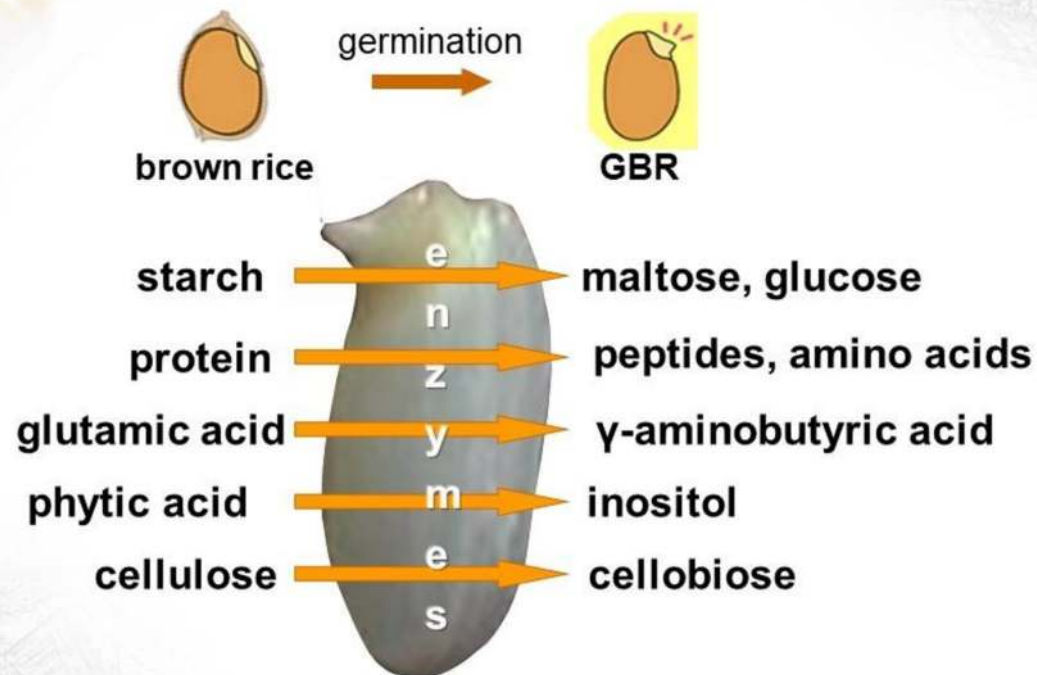
Glycemic Index



Trinidad et al., 2013

Additionally, brown rice has relatively lower glycemic index than white rice which means that it takes longer time to transform into glucose which helps control blood sugar level.

Germinated Brown Rice



<http://www.hatsuga.com/DOMER/english/index.html>

A healthier variant of brown rice is the germinated brown rice as germinating helps add nutrients to it.

Health Benefits

GABA
hypotensive
brain metabolism
anticancer

FERULIC ACID
free radical
scavenger

PHYTIC ACID
antioxidant
CVD

INOSITOL
fat metabolism
blood sugar



MAGNESIUM
heart disease

POTASSIUM
blood pressure

TOCOTRIENOLS
free radical
scavenger

FIBER
constipation
colon cancer

ZINC
reproductive
arteriosclerosis

ORYZANOL
antioxidant
cholesterol

http://www.pgbr.jp/Portals/15/Document/PGBR_and_its_functionality.pdf

One of the most beneficial nutrients in germinated brown rice is the gamma-aminobutyric acid (GABA) which is used as food supplement in other countries to improve brain metabolism, prevent cancer, and lower blood pressure.

Slide 35 Transcript



The nutri-rice milk is an example of a product that contains germinated brown rice. It is a milk-based beverage manufactured by the Philippine Carabao Center (PCC).



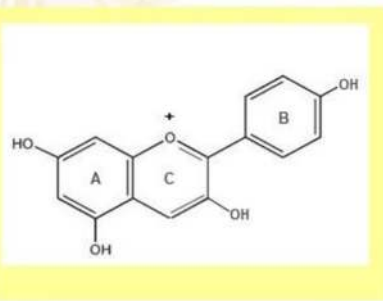
PIGMENTED RICE

- Belongs to specialty rices
- Color ranges from various shades of red, purple, and black
- Rich in vitamins and minerals
- Possesses antioxidant properties

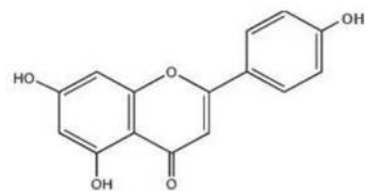


Another healthier alternative to white rice is pigmented rice, which include black and red rice due to its antioxidant content.

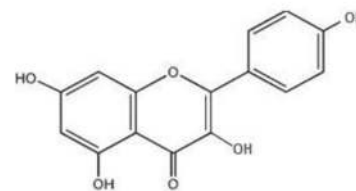
Antioxidants



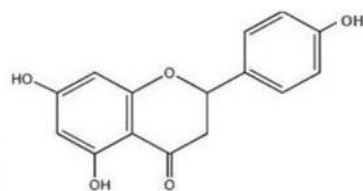
Anthocyanidins



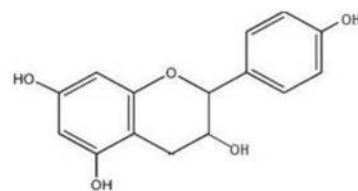
Flavones



Flavonols



Flavanones



Flavanols

The antioxidants in pigmented rice is derived from its anthocyanin content which gives the grains its distinct colors.

Food Products



Black Paella



Table rice, Banaue, Ifugao



Tausug
Wajit, Sulu



Bico,
Bulacan



Puto Bumbong

Black and red rice can be used for different types of dishes. The original *puto bumbong* is traditionally made from purple rice although white rice with food color is now more commonly used by vendors.



There are also “healthier rice” infused with iron (Hi-Iron) and zinc (Hi-Zinc) for people with micronutrient deficiency like anemia and zinc deficiency.

Low-Protein Rice



Low-protein NSIC Rc 160

- A pre-cooked, protein-reduced rice (0.25-1.55% CP) intended for individuals on a restricted protein diet.

In collaboration with BioTech Japan, a low protein rice has also been developed for those in a restricted protein diet (e.g. chronic kidney disease patients).

Romero et al., 2017



Aside from rice, we are also encouraged to consume alternative sources of carbohydrates like banana, potato, cassava, sweet potato, corn, and gabi.



There are also rice mixes which is a combination of rice and other alternative food source of carbohydrates.



Another objective of this presentation is to determine whether locally produced rice is safer than imported rice.

Quality Standards for Milled Rice						
Parameter	Grade					
	Premium	Grade no. 1	Grade no. 2	Grade no. 3	Grade no. 4	Grade no. 5
Grade factors (% by weight)						
Broken kernels, max. (total including brewers)	5.00	10.00	15.00	25.00	35.00	45.00
Brewers, max.	0.10	0.20	0.40	0.60	1.00	2.00
Defectives						
Damaged kernel, max.	0.50	0.70	1.00	1.50	2.00	3.00
Discolored kernel, max.	0.50	0.70	1.00	3.00	5.00	8.00
Chalky kernel, max.	4.00	5.00	7.00	9.00	12.00	15.00
Immature kernel, max.	0.20	0.30	0.50	1.00	1.50	2.00
Contrasting type, max.	3.00	5.00	10.00	-	-	-
Red kernel, max.	1.00	2.00	4.00	5.00	6.00	7.00
Foreign matters, max.	0.025	0.10	0.15	0.17	0.20	0.25
Paddy, max. (no. per 1,000 grams)	5.00	10.00	15.00	20.00	25.00	30.00

To ensure the quality of rice sold in local markets, a Philippine National Standard (PNS) was created by the Bureau of Agriculture and Fisheries Standards (BAFS) wherein quality standards for grading of rice are indicated.

Quality Standards for Milled Rice

PNS (BAFS)

PNS/BAFS 290:2019

5 Food safety parameters

These parameters are further defined in terms of Maximum Residue Limits (MRLs) for pesticides, maximum level (ML) for contaminants (heavy metals), maximum moisture content, presence of insect infestation, and microbial infection.

5.1 Maximum Residue Limits (MRLs)

The MRLs for rice shall be in conformance with the National Standards (PNS/BAFS 162:2015) and its latest issuance.

5.2 Maximum Level (ML)

The ML for rice shall be in conformance with the National Standard for Cereals (PNS/BAFS 141:2015) and its latest issuance.

Maximum moisture content for paddy and milled rice shall be in conformance with the set value which is 14 % as stated under the PNS for Agricultural Practice for Rice (PNS/BAFS 141:2015) and PNS Organic Milled Rice (PNS/BAFPS 42:2008).

5.4 Insect infestation

Rice shall be free of any live stored grain insect pest.

5.5 Microbial infection

Rice shall be free of signs of microbial infection.

1. Pesticides
2. Heavy metals
3. Insects
4. Microorganisms

Aside from grading and evaluating rice based on its quality, it is also assessed based on its safety. This is primarily done by measuring the maximum residue levels or maximum amount of pesticides, heavy metals, insect infestation, and microbial infection on rice.

Pesticide Residue in Rice

PNS (BAFS)



Table 6.2. Average amount of pesticides applied by farmers (kg ai ha⁻¹), by type of pesticide across countries and seasons, crop year 2013-2014.

Type of pesticide	Philippines (Nueva Ecija)	China (Zhejiang)	Indonesia (West Java)	India (Tamil Nadu)	Thailand (SuphanBuri)	Vietnam (Can Tho)
High-yielding season						
Herbicides	0.33	0.74*	0.59	0.28	0.76*	0.46
Insecticides	0.24	1.85*	2.38*	0.49*	0.35	0.31
Fungicides	0.05	1.28*	0.34	0.15	0.19	0.86*
Molluscicides	0.29	0.00*	0.35	0.00*	0.00*	1.07*
Rodenticides	0.03	0.00	0.05	0.05	0.00	0.00
Low-yielding season						
Herbicides	0.27	0.17	0.72*	0.26	0.87*	0.43
Insecticides	0.31	0.39	2.78*	0.69	0.36	0.49
Fungicides	0.05	0.62*	0.27*	0.11	0.19	0.85*
Molluscicides	0.34	0.00*	0.39	0.00*	0.00*	0.96*
Rodenticides	0.13	0.00*	0.05	0.00*	0.00*	0.01*
Third season						
Herbicides						0.44
Insecticides						0.36
Fungicides						0.89*
Molluscicides						1.00*
Rodenticides						0.00

Note: * indicates significance at 95% confidence level. Test of means is between Philippines and a specific country.

- Filipino farmers use lower amount of pesticides compared to other Asian countries
- Herbicides, insecticides, fungicides, molluscicides, rodenticides

Bordey et al., 2016

The maximum residue limit per type of pesticide is also included in the PNS. A PhilRice study revealed that pesticide use in the country is lower compared to China, Indonesia, Thailand, and Vietnam. This includes all types of pesticide (herbicide, insecticide, fungicide).

Heavy Metals in Rice

The IRRI logo consists of the letters "IRRI" in white, bold, sans-serif font, set against a green rectangular background.

Rice and heavy metals

Occasionally, there have been health scares around contaminants in rice, such as lead, arsenic, or cadmium. While it is important to test for and minimize the causes of food contamination, the vast majority of rice produced for human consumption has so far not been found to be widely contaminated with any of these.

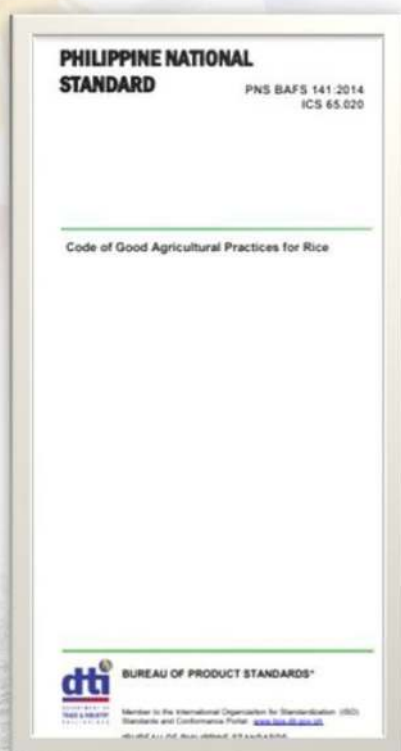
PhilRice

- 20 rice samples from Philippines, Myanmar, Vietnam, and Thailand had below MRL for Arsenic (0.20 mg/kg), Mercury (0 mg/kg), and Cadmium (0.40 mg/kg).
- 2 rice samples from Myanmar (0.34 and 0.58 mg/kg), 1 from Vietnam (0.48 mg/kg), and 1 from Thailand (0.64 mg/kg) exceeded the MRL for lead (0.20 mg/kg).

Mamucod et al., 2019

The study involved 20 rice samples which all passed the test for arsenic, mercury, and cadmium. However, two rice samples from Myanmar, one from Vietnam, and one from Thailand exceeded the maximum residue limit for lead.

Good Agricultural Practices



GAP (BAFS)

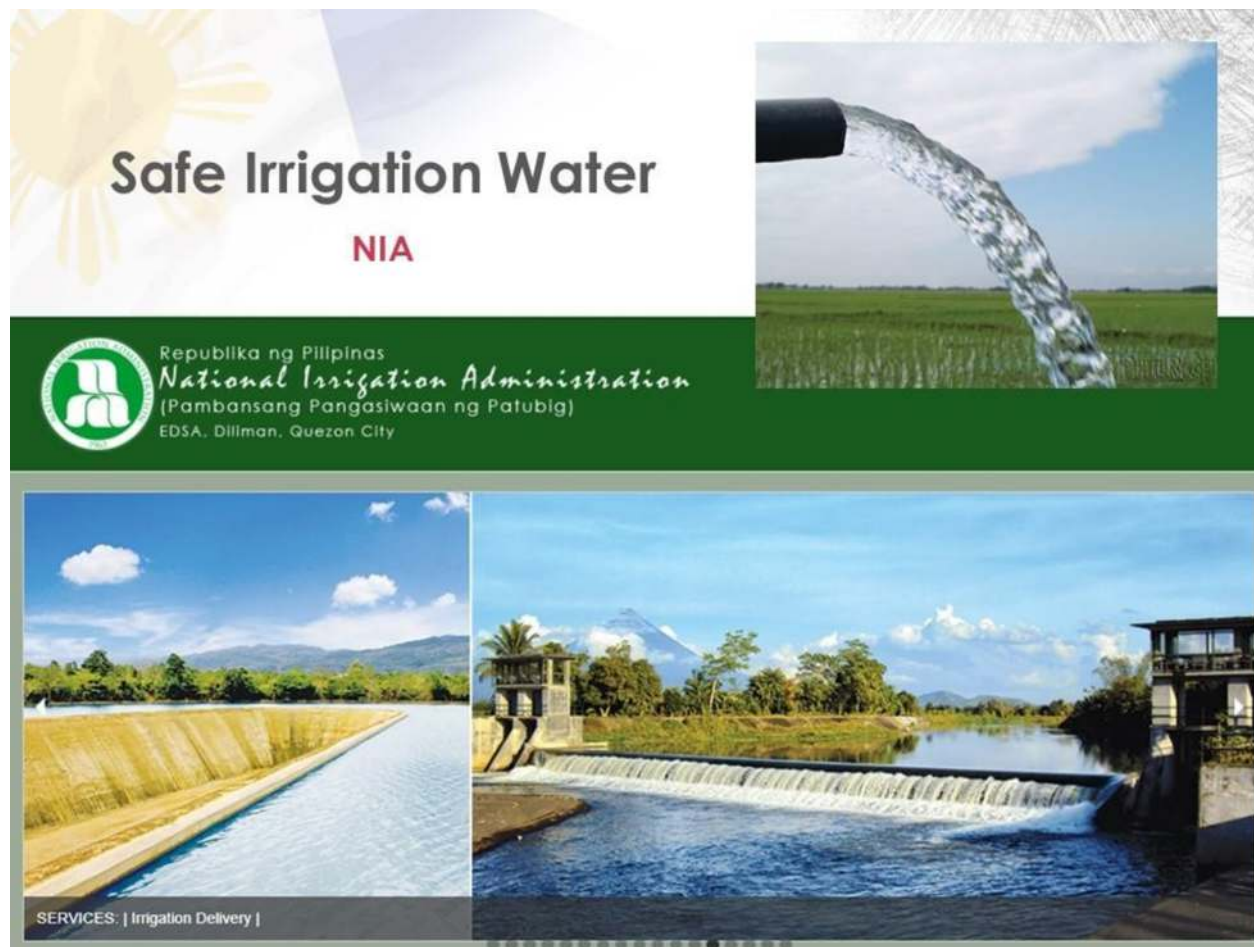


- Practices that address environmental, economic and social sustainability for onfarm processes, and which result in safe and quality food and non-food agricultural products (RA 10611)

Good agricultural practices (GAP) is also being advocated to farmers to ensure the safety and quality of harvests in the country.



Additionally, farmers are encouraged to and educated on the use of integrated pest management (IPM) which makes use of beneficial microorganisms to fight insect pests as a natural way of pest control and minimize the use of chemical pesticides.



The National Irrigation Administration (NIA), on the other hand, ensures the safety of water used for irrigation.



Unlike imported rice, locally produced rice are readily available and accessible. This means that it underwent shorter storage period relative to imported rice whose storage period prior to and during shipping is unknown. Accordingly, local rice did not pass through chemical fumigation that may compromise safety.

Freshly Harvested and Shorter Storage

- Readily available and accessible after harvesting
- Shorter storage period
- Proper storage conditions (moisture content, relative humidity, protection from pests (insects, rodents, and birds))
- Available milling facilities



Local Rice
Better quality

Diverse
Available
Accessible

Wide quality options

- Milling quality
- Physical quality
- Physicochemical quality
- Cooking quality
- Eating quality
- Nutritional quality

In summary, we have a diverse variety of rice in the country that are readily available and accessible to us. However, we must be careful in comparing these varieties and options given the different measures of quality.



Consumers are assured of the safety of locally produced rice through the Philippine National Standard (PNS), Integrated Pest Management (IPM), and Good Agricultural Practices (GAP) which farmers are encouraged to adopt and follow. Accordingly, less pesticides have been used in local rice. It also does not contain heavy metals and is fresh with short storage period.

Question & Answer

If brown rice is healthier than milled rice, why is it that less Filipinos consume it, and why is it less commercially sold in the Philippines? Isn't it a better option especially for those in the marginalized sector?

Before sophisticated milling machines reached the country, our ancestors ate brown rice as it is easily done just by pounding (*pagbabayo*) the unhusked rice or *palay*, and apparently, they were much healthier than us. Less Filipinos consume or demand brown rice due to low awareness on its benefits. Consequently, it is less commercially available than white rice due to the lower demand. Hence, we are currently trying to raise awareness to spur consumer demand for brown rice which will then encourage supply. Although it can be noted that brown rice is already available in supermarkets. Related to this, the Rice Engineering and Mechanization Development (REMD) of PhilRice has a project wherein brown rice machines were initially distributed in four regions for pilot testing in coordination with DA-Regional Field Offices (DA-RFO). Through this, we are slowly trying to make brown rice more accessible, available, and affordable to consumers.

Question & Answer

What are the key takeaways that you can give to consumers so that they can also help farmers?

Aside from government assistance, capital, and technology, our farmers need support from consumers. In this context, it will be helpful if we can share what we learned from this webinar to our friends especially since information sharing has become more convenient through the help of social media. Let us also check the labels of rice that we buy especially in supermarkets to see if it is locally produced. In the case of rice sold in public markets, we can ask our “*suki*” wholesalers or retailers regarding the source of rice that they sell. Additionally, let us patronize locally produced rice and try different varieties especially the “healthier rice” variants as there are different kinds of rice available in local markets.

Question & Answer

How is brown rice cooked?

More suited rice varieties are now selected to be processed into brown rice, usually tender ones when cooked. However, the normal practice involves soaking for 30 minutes before placing on the stove. For tender varieties like NSIC Rc 160, soaking is omitted and brown rice can be cooked immediately after washing. A ratio of 1:2 (rice:water) is suggested for brown rice unlike for white rice which is 1:1. It is also important that rice is not overwashed as there are many water-soluble nutrients that can be washed away. It is recommended that rice be washed once to retain its nutrients.

Question & Answer

Is it difficult to cultivate or maintain brown rice?

There is no specific variety used for brown rice. Any rice variety can be processed into brown rice. Cultivation and management is determined by the variety and not by the type of rice. More suitable varieties are just selected for processing into brown rice to ensure its tenderness once cooked. Some of these varieties include NSIC Rc 160, NSIC Rc 216, and NSIC Rc 218 which have low to intermediate amylose content. A list of varieties and its amylose content can be found in the PhilRice website for reference. It must also be noted that rice with very low amylose content (e.g. malagkit) is not usually used for brown rice as it is not regularly consumed as table rice.

Question & Answer

**Who are the common consumers of brown rice?
Is there segmentation of brown rice consumers?**

A project on brown rice market segmentation has been conducted and is nearly finished. Consumers often perceive that brown rice is for the middle to high income earners due to its price and availability as it is usually sold in supermarkets usually in urban areas. Hence, we are trying to make it more available and accessible to those in the rural areas.

Question & Answer

Does mixing of pigmented rice with white rice affect its effectivity in improving our health?

We should not prefer overly white rice as this means that bulk of the nutrients have been removed during the milling process leaving carbohydrates alone. When mixing white and pigmented or brown rice, it should be almost similar in quality to ensure that both types of rice are cooked properly. The ratio can also be considered if we prefer a more nutritious mix. That is, we may opt to put more pigmented than white rice if we want it to be more nutritious.

Question & Answer

Are there other interventions being undertaken to make brown and pigmented rice more accessible and available to the lower class or “poor people”?

We are trying to increase the available supply of these types of rice as doing so can help lower its price (by law of supply and demand). Deployment and distribution of machines, and seeds of these rice varieties are being undertaken to make it more available, accessible and affordable to consumers.

Question & Answer

Can pregnant women and those anemic consume brown rice?

This is being studied as brown rice has phytic acid. Although phytate is a type of antioxidant, the health status of an individual must still be considered. In the case of anemic or pregnant women, they are advised to eat foods with lower phytic acid. A study made by Dr. Juliano and the Food and Nutrition Research Institute (FNRI) showed that consumption of brown rice does not affect the absorption of iron, making it okay for them to consume brown rice. However, such individuals must still follow their doctor's advice regarding this matter.