

PROCEEDINGS OF THE POLICY  
SEMINAR-WORKSHOP ON MAINSTREAMING  
BROWN RICE TO LOW- AND MIDDLE-  
INCOME FAMILIES

OASIS HOTEL, CLARK FIELD PAMPANGA  
SEPTEMBER 29, 2011





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SEPTEMBER 29, 2011

**Sponsored by**  
Philippine Rice Research Institute (PhilRice)  
Philippine Rural Reconstruction Movement (PRRM)  
and the  
Rice Watch and Action Network (R1)

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# FOREWORD

The Philippine government has been pursuing rice self-sufficiency to protect the country from the negative effects of rice supply changes in the world market. The Department of Agriculture (DA) has created the Food Staples Sufficiency Program (FSSP) for 2011-2016 to guide stakeholders in implementing projects and activities that would cater to this goal.

One of the interventions identified in the FSSP is the promotion of brown rice production and consumption. Brown rice has a milling recovery that is 10% higher than white rice. Thus, its production can help the country obtain greater volume of rice. Also, it is more nutritious than white rice because the bran is retained in the grains. Brown rice is a means to address rice insufficiency and malnutrition problems in the country.

The Philippine Rice Research Institute (PhilRice) supports this brown rice advocacy as it is a part of the institute's core goals of (a) attaining and sustaining rice self-sufficiency and (b) reducing poverty and malnutrition incidence. Hence, the institute explores ways in making brown rice more available in the market and affordable to consumers.

PhilRice, in collaboration with the Philippine Rural Reconstruction Movement (PRRM) and the Rice Watch and Action Network (R1), organized and conducted the "Policy Seminar-workshop on Mainstreaming Brown Rice to Low- and Middle-income Families" in September 2011 at Clark, Pampanga. This activity successfully gathered and led rice stakeholders in identifying ways that could enhance the supply and acceptability of, and increase public awareness on brown rice. The policy recommendations that were drawn from the seminar-workshop are expected to create favorable environment for brown rice production and consumption.

**"Brown rice is a means to address rice insufficiency and malnutrition problems in the country."**

These proceedings document the paper presentations, discussions, and group interactions that transpired during the seminar-workshop. It can serve as a reference material for those engaged in brown-rice researches, policymaking, production, and promotion.

This publication is an initiative of the Policy Research and Advocacy team of PhilRice. The group intends to create an avenue for information sharing to heighten awareness of stakeholders, especially the policymakers, on current issues confronting the rice industry. This is expected to strengthen the link between researches and policymaking.

**EUFEMIO T. RASCO, JR., Ph.D.**  
Executive Director

# POLICY SEMINAR-WORKSHOP ON MAINSTREAMING BROWN RICE TO LOW- AND MIDDLE-INCOME FAMILIES

## Rationale

The government is now actively promoting the consumption of brown rice (unpolished milled rice) because of its nutritional value and potential contribution to the attainment of rice self-sufficiency. Brown Rice is regarded as a tool to improve the nutrition status of the population and as a means to augment the gap between domestic rice supply and demand.

Brown rice is also called whole rice grain because only the husk is removed during milling. The grain still contains the bran that makes it more nutritious than the polished rice. Brown rice is a good source of dietary fiber, Vitamin B complex, minerals, protein, and other phytochemicals.

Also, Brown rice has a better milling recovery than polished rice. Researchers say that it has a milling recovery advantage of 10% over white rice. Increasing the supply of brown rice in the market, therefore, can substantially increase the amount of available rice for consumption.

On the part of millers, producing brown rice means shorter milling time and less energy requirement as polishing and whitening are removed from the milling process.

Despite these benefits, brown rice is unpopular among Filipinos, especially to those belonging to the low-income group. Demand has been coming from few health-conscious people who belong to high-income groups. This trend is attributed to the product's expensive cost, short shelf-life, unappealing texture, longer cooking time requirement, and its limited supply in the market.

The government is now facing the challenge in making brown rice more attractive to the public, especially among poor families whose major food intake is rice. This is aligned with the government's goal of reducing the incidence of malnutrition, which is common in the low-income group. To accomplish this, the government has to devise and implement strategies that could increase accessibility and acceptability of brown rice to the consuming public.

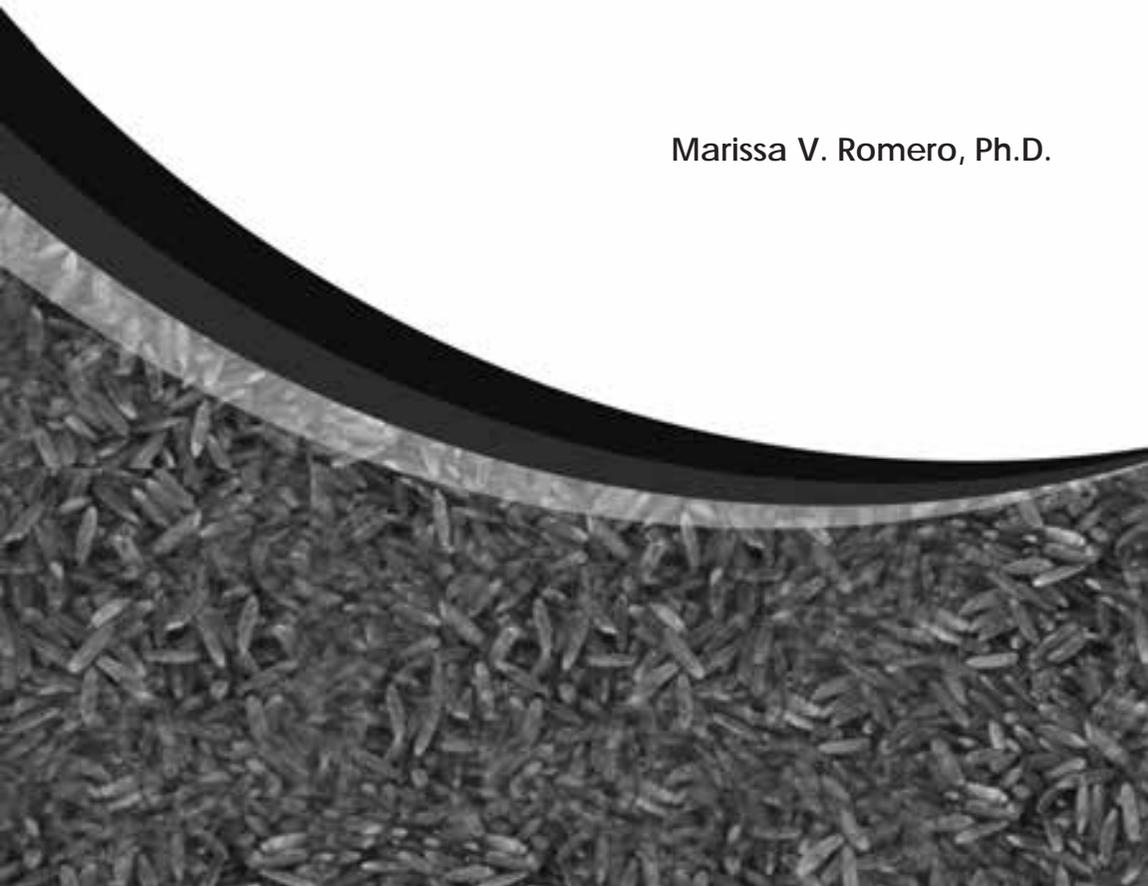
With this, the Philippine Rice Research Institute (PhilRice), through its Policy Research and Advocacy Project (PRAP) and the Natural Products and Value-adding Systems Development Program (NPVSDP), desires to explore policy recommendations that can help increase the acceptability of brown rice among low- and middle-income families. Likewise, the project intends to provide a venue for information sharing to increase awareness of stakeholders about the current status and issues confronting the brown rice market. Hence, this workshop is being proposed. PhilRice partners with the Philippine Rural Reconstruction Movement (PRRM), and the Rice Watch and Action Network (R1) to pursue this endeavor.

## **Objectives:**

1. Identify and quantify the nutritional advantages of brown rice over polished rice;
2. Determine the effects of commercializing brown rice to per capita consumption, milling recovery, and ultimately, to rice self-sufficiency;
3. Determine the technology requirement for brown rice commercial production;
4. Determine the ways to increase acceptability of brown rice among consumers;
5. Determine the initiatives of civil societies in the production and marketing of brown rice; and
6. Draw recommendations that can create favorable policy environment to increase accessibility and acceptability of brown rice to low and middle-income families.

# NUTRITIONAL AND HEALTH ASPECTS OF BROWN RICE

Marissa V. Romero, Ph.D.



# NUTRITIONAL AND HEALTH ASPECTS OF BROWN RICE

Marissa V. Romero, Ph.D.<sup>1</sup>

## Abstract

For many countries of the world, rice is undoubtedly the most highly regarded crop because it forms the foundation of their diet. The Philippines is one of them. The deep fondness of Filipinos for rice is manifested in the increasing per capita consumption. Producing enough rice to feed the growing population in the country is indeed a great challenge for the agriculture sector. There are good reasons in sticking with rice as staple food because it provides not only carbohydrates, but other macronutrients and micronutrients as well. Even more interesting is the presence of other phytonutrients with health-promoting properties. However, the availability of these nutrients depends on the forms of rice, which are described in this paper. The nutrient compositions of brown or unpolished or dehulled rice and white or polished or milled rice are compared, and the basis for the nutritional superiority of brown rice over white rice is presented. The health benefits associated with brown rice consumption are also discussed, but it should be emphasized that many of them are based on *in vitro* studies, indicating the need for more human studies that can provide scientific evidence for these health claims. The paper finally enumerated the major barriers to brown rice commercialization and consumption that can dampen the campaign to shift consumer preference from white rice back to brown rice. The limitations of brown rice in terms of cooking and eating quality, shelf-life, and the presence of antinutrition factors, particularly phytic acid, must be addressed through extensive research in order to take advantage of the wealth of nutrients that lie beyond the “dirty” look of brown rice.

**Keywords:** brown rice, unpolished rice, milled rice, nutrient composition, health aspects

## Introduction

Rice (*Oryza sativa* L.) is an extremely important crop because a large segment of the world’s population depends on it for their daily sustenance. It is grown in over 100 countries, with harvest reaching  $480 \times 10^6$  tons in the developing world alone in 2005 (Juliano, 2007). As the main source of energy, rice forms the foundation of diet for many people. It is also the major source of protein to those who cannot afford to buy meat, fish, or other protein-rich foods. Furthermore, rice contains vitamins, minerals, dietary fiber, antioxidants, and other phytonutrients, and it is also low in fat and has no cholesterol.

As in many Asian countries, rice is also the staple food in the Philippines where majority of the Filipinos eat it at least twice a day. In fact, rice

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represents 35.6% of our daily food intake (FNRI, 2010). Rice is mainly consumed as table rice in boiled form, and only a small portion is used for processing. The per capita rice consumption reached up to 120 kg in 2010 (Francisco, 2011). The total rice production of 15.77 M metric tons for the same year (BAS, 2011) was not enough to meet the requirement of about 96 M population of the country.

The major components of the rice grain are the hull, bran, germ, and endosperm (Figure 1). The hull or husk, which is made of tough materials, is the outermost covering of the rice grain. It is composed of the palea (dorsal) and lemma (ventral). Rice hull protects the bran and the endosperm against insect and microbial infestations. The average hull weight is about 20% of rough rice weight (Juliano, 2007).

The bran is the brownish portion of rice that is left on the starchy endosperm after dehulling and is subsequently removed during polishing. It is composed of the pericarp, seed coat, nucellus, aleurone and subaleurone layers, germ, and depending on the degree of polishing, it may also contain a small amount of endosperm. Rice bran is considered a low-valued by-product of rice processing. Although abundant, the utilization of rice bran is still limited. However, rice bran is recognized as a good source of edible and healthful products because it contains about 11.5 to 17.2% protein, 12.8 to 22.6% fat, 6.2 to 14.4% total fiber, and 8.0 to 17.7% carbohydrates (Monsoor, 2003). Because of its high oil content, the rice bran is a good source of edible oil. Thailand and India are the major rice bran oil (RBO) producers. However, the production of RBO is still very small compared to other commercial edible oils.

The embryo is the small entity located on the ventral side at the base of the rice grain. It is composed of the cotyledon and the embryonic axis. The starchy endosperm is made up of the subaleurone layer and the central region. It consists of parenchyma cells filled with starch granules and protein bodies (Juliano, 2007).

Rice is harvested as rough rice or paddy, which is usually stored for about two months at below 14% moisture content prior to processing. The dehulling process removes the husk or hull from the rough rice. The resulting brown rice is then polished through abrasive or friction milling to strip off the bran layer, thereby producing the milled or white rice (Figure 2). About 10% of the weight of brown rice is removed during polishing. The hull and bran are considered by-products of rice processing with limited utilization.

## **Brown Rice Description and Properties**

Brown rice is the unpolished whole kernel produced by removing the hull or husk of paddy or rough rice while leaving the bran layer intact. It is composed of the bran, germ, and some parts of the endosperm. It should be noted that processing defines brown rice and not its color, therefore, it is

more technically correct to call it unpolished or dehulled rice. Any kind of rice, including black, red, or other pigmented rice, can be converted into brown rice when dehulled, as opposed to the common notion that only certain varieties can be turned into brown rice.

In the early days, the removal of the hull is accomplished tediously by hand-pounding with mortar and pestle. Brown rice was the original form of rice consumed, and people were used to its tan or brown color, nutty flavor, and chewy texture. Even Filipinos liked eating *pinawa* (Tagalog for brown rice) in the past. The fondness for eating brown rice faded with the introduction of sophisticated milling equipment. Consumer preference shifted in favor of white or milled or polished rice. As a consequence, brown rice started to be regarded as peasant's food and is associated with poverty. The socio-economic stigma on brown rice somehow still persists to this day.

However, beyond the crude, "dirty" appearance lies a wealth of healthy components. Brown rice is rich in vitamins, minerals, dietary fiber, and other phytonutrients. In some affluent countries, brown rice is recognized as health food. According to Cuyno (2003), Germany probably tops the list in brown rice consumption and in Thailand, the king himself leads the campaign in popularizing this product. Babu et al. (2009) recently reviewed brown rice in order to rekindle the interest in what they call a lost health food.

In the Philippines, the Asia Rice Foundation (ARF) spearheaded the revival of brown rice consumption by launching the Los Baños Pinawa in 2000 (Brown Rice Campaign Committee, 2000). Aside from spreading awareness on the health benefits of brown rice, the undertaking aimed to foster collaboration with partners for a massive campaign to promote this product in the country. Cuyno (2003) described the national campaign, which intends to promote the consumption of brown rice as means to combat hidden hunger, that is lack of essential micronutrients in the diet and its adverse consequences on human health. The campaign has a conceptual framework called a diamond strategy which involves the product, demand and supply, and the social marketing activities. The ARF chair reiterated the need to promote brown rice to address the problem of hidden hunger (Javier, 2004). The Brown Rice Advocates (BRADS), a coalition of government and non-government establishments and institution, was recently created to lead the campaign to promote the production and consumption of brown rice. The coalition recently published a reference material describing basic information on brown rice (BRADS, 2009). Despite these different initiatives, most Filipinos still seem to have a limited knowledge about brown rice.

### **Nutrient Composition: Brown (Unpolished) Rice Versus White (Polished) Rice**

Rice is composed of carbohydrates, proteins, lipids, and other minor constituents. Carbohydrates in the form of starch make up the greatest proportion. Amylose and amylopectin, which are made up of glucose units, are the linear and branched fractions of starch, respectively. In the Philippines,

rice is classified based on amylose content as follows: waxy or glutinous (0-2%), very low (2-10%), low (11-20%), intermediate (21-25%), and high (>25%) (Rice Technical Working Group, 1996).

Protein is a polymer of amino acids. Among cereals, rice has the lowest protein content, but it has good protein quality because of the relatively high amount of lysine, an essential amino acid. The proteins in rice are composed of 10% albumin, 5% globulin, 20% prolamin, and 65% glutelin (Juliano, 2007). Most of the lipids in rice are concentrated in the bran. The major fatty acids are oleic, linoleic, and palmitic acid. Vitamins (B vitamins and vitamin E), minerals (phosphorus, iron, zinc, calcium, magnesium, etc.), unsaponifiable matters, and antioxidants are also present in rice.

Brown rice contains significant amounts of these nutrients, but most of them are eliminated during polishing to obtain the more commonly consumed white, polished or milled rice. This process removes about 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 from the whole rice grain (Pasikatan et al., 1995).

As shown in Table 1 (Juliano, 2010), brown rice is nutritionally superior to milled rice in terms of protein, fat, dietary fiber, B vitamins and vitamin E, minerals, and antioxidants. Based on the Recommended Dietary Allowance, and when rice comprises a large portion of the diet, brown rice would provide adult women more than sufficient niacin (200%), thiamine (190%), and phosphorus (154%); and about 91% protein and 60% zinc. On the other hand, men would get 230% phosphorus, 196% niacin, 189% thiamine, 133% iron, 116% protein, and 90% zinc from brown rice (De Lumen and Chow, 1990).

An Important component identified in brown rice is  $\gamma$ -oryzanol, a mixture of ferulate esters of triterpene alcohols and phytosterols. The major components of  $\gamma$ -oryzanol were identified to be 24-methylenecycloartanol ferulate, campesterol ferulate, cycloartenol ferulate, and sitosterol ferulate (Fang et al., 2003).  $\gamma$ -oryzanol was reported to Isabelita M. Pabuayonrove plasma lipid profile, reduce total plasma cholesterol, increase high density lipoprotein (HDL) cholesterol level, and inhibit platelet aggregation (Cicero and Gaddi, 2001). It was also found to exhibit antioxidant properties in *in vitro* systems (Kim et al., 1995). The investigation on the molecular mechanism of  $\gamma$ -oryzanol's antioxidant activity showed that it is an organic radical scavenger, which is capable of preventing lipoperoxidation (Juliano et al., 2005). The  $\gamma$ -oryzanol content of 30 brown rice samples of European origin ranged from 26 to 63 mg/100 g (Miller and Engel, 2006). The variability was attributed to environmental factors such as planting season and location.

### **Sprouted or Germinated Brown Rice**

The simple step of sprouting or germination can further enhance the nutrient profile of brown rice by activating dormant enzymes involved in

the physiological transformations. In addition, sprouting improves the taste and texture of brown rice. Sprouted brown rice or germinated brown rice is popular among health enthusiasts and has been marketed first by Domer Co. in Japan. PhilRice found that certain local rice varieties are suitable for this product, optimized the sprouting procedure, characterized the product, and conducted shelf-life evaluation (Romero, 2008).

## Health Issues Associated with Brown Rice

Many studies have shown that consumption of whole grain foods is good for our health. The United States Food and Drug Administration has already approved the classification of brown rice as a whole grain. As described earlier, brown rice contains carbohydrates, protein, fat, fiber, vitamins, minerals, antioxidants, and other phytonutrients which are beneficial to human nutrition and health. Some are considered to have the ability to prevent the onset or reduce the incidence of certain diseases. There have been claims for its action against cardiovascular diseases such as hypertension, hypercholesterolemia, heart disease, and stroke; some forms of cancer particularly colorectal cancer; and diabetes (Babu et al., 2009). The health claims on brown rice are usually based on associating the good components present in it with their beneficial effects on human health. There are limited investigations on the actual effects of brown rice on certain diseases in humans. Some of the related *in vitro*, animal, and human studies are enumerated below.

Blood pressure of non-hypertensive men with elevated cholesterol was reduced by a diet with whole grains, including brown rice (Hallfrisch et al., 2003). The results indicated that consumption of diets high in whole grain foods lowered systolic and diastolic blood pressure in moderately hypercholesterolemic men, whether sources are soluble or insoluble fiber. They further concluded that addition of whole grain foods to the diet can reduce risk of cardiovascular disease.

Hudson et al. (2000) evaluated the potential tumor-suppressive properties of brown rice against colon and breast cancers. Identified in the rice extracts were eight phenols, namely, protocatechuic acid, *p*-coumaric acid, caffeic acid, ferulic acid, sinapic acid, vanillic acid, methoxycinnamic acid, and triclin. These phenols were found to possess cytostatic/cytotoxic and anticlonogenic properties in human-derived immortalized and tumorigenic colon and breast cancer cells as shown on Fig. 3. Among the phenols investigated, triclin was the most potent. Since phenolic compounds are present at much higher amounts in brown rice than white rice, the study suggested that the consumption of brown rice may be advantageous in terms of cancer prevention.

Triclin present in brown rice was further evaluated against intestinal carcinogenesis (Cai et al., 2005). The results show that triclin was able to reduce the number of small intestinal adenomas in mice by 33% (Fig.4). The

study recommended more investigations on tricin as a putative colorectal cancer chemopreventive agent.

Glycemic index (GI) is the relative increase in blood glucose following the intake of a 50g carbohydrate, with bread or glucose as reference food. It is being used as a tool in the management of diabetes. Whether rice is considered a high or low GI food is difficult to answer because of the wide variation in the reported values in various studies, which could be attributed to the differences in amylose content (AC) of rice (Miller et al., 1992). It was reported indeed that the GI of cooked rice varies depending on AC (Juliano, 2010). As shown in Table 2, lower GI values were obtained with higher AC of rice and processed products. The brown rice of waxy-low AC rices had slightly lower GI than the milled rice but for intermediate-high AC rices, the values were similar for brown rice and milled rice.

In addition to screening for GI, Miller et al. (1992) also investigated the insulin index (II) of different kinds of rice and its products available in Australia (Table 3). The high amylose variety (Doongara with 28% AC) gave significantly lower GI and II than Calrose and Pelde (with 20% AC). They observed that the GIs of the brown rices and their white counterparts were similar, except for Pelde, which gave a significantly lower GI for its brown rice form. The results indicate that most of these rice varieties whether brown, white, or parboiled should be classified as high-GI foods, and only the high-amylose variety could be potentially be considered in low-GI diets. Although there was a positive correlation between GI and II ( $r = 0.75$ ,  $P < 0.05$ ), it was lower than expected. Therefore, it was suggested to consider both GI and II in the management of carbohydrate foods for diabetics.

A recent study assessed the relationship of consumption of white or brown rice and risk of type 2 diabetes mellitus in men and women in the United States (Sun et al., 2010). Higher intake of white rice (5 or more servings per week) was associated with a higher risk of type 2 diabetes (1.7), while high intake of brown rice (2 or more servings per week) was associated with a lower risk of type 2 diabetes (0.89). They approximated that replacing 50g/day intake of white rice with the same amount of brown rice was associated with a 16% lower risk of this disease. However, the same replacement with other whole grains gave an even lower risk at 36%. The study concluded that substitution of whole grains, including brown rice, for white rice may lower risk of type 2 diabetes.

There are very limited human studies that provide scientific evidence to the health benefits that could be obtained from brown rice consumption. Therefore, more extensive research must be conducted to clearly understand the relationships between the components present in brown rice and human health, particularly in disease prevention.

## Barriers to Brown Rice Commercialization and Consumption

Despite the overwhelming good reasons for eating brown rice, its consumption is still minimal due to some issues of concern. First is the association of its brown color or “dirty” look with inferior quality due to poor postharvest management and storage. Brown rice appears to be suitable only as animal feed or food for the economically disadvantaged citizens. As a consequence, brown rice is correlated with poverty and white rice with affluence. There is a notion that the poor can only afford to purchase brown rice, while the classy elite can very well feast on white rice. Due to the socio-economic Isabelita M. Pabuayon's research on brown and white rice, there was a shift on consumer preference from the traditional brown rice to white rice with high class appeal. Hence, rice consumers have learned to dislike the branny and nutty flavor of brown rice, and have acquired a taste for a more bland white rice.

Since the intact bran with impermeable layer is still present in brown rice, water penetration is difficult resulting in a longer cooking time. Brown rice takes about 45 minutes to cook compared to only 20 minutes with white rice (Champagne, 2007). Another drawback with brown rice is its rough or coarse cooked texture leading to more chewiness.

Knowing the varieties that have acceptable cooking and eating quality as brown rice will help encourage its consumption in the Philippines. To identify the rice varieties suitable for brown rice production, a total of 22 local varieties with varying amylose content were screened (Corpuz et al., 2009). The characteristics of the resulting brown rice are indicated in Table 4. Total brown rice recovery ranged from 75.1 to 79.5%. Textural analysis using the Instron machine showed that low- and intermediate-amylose rices with high to intermediate gelatinization temperature (GT) had relatively softer cooked brown rice (<3.0 kg/cm<sup>2</sup>). A significant correlation between Instron hardness value of cooked brown rice and amylose content ( $r = 0.61$ ) was obtained. Based on the screening and selection process conducted, rice varieties with low amylose content such as NSIC Rc160, MS8, and MS6 or those with intermediate amylose content and intermediate GT such as PSB Rc14, PSB Rc18, PSB Rc28, NSIC Rc144, NSIC Rc150, and NSIC Rc154 are suitable varieties for brown rice production.

One of the greatest limitations to brown rice commercialization and consumption is its shorter keeping quality. The bran cells are damaged during the dehulling process resulting in the release of the enzyme lipase, which breaks down the oil in the bran. Consequently, brown rice becomes prone to hydrolytic or oxidative rancidity. The high oil content of brown rice also makes it susceptible to microbial attack and insect damage. Its shelf-life is 3-6 months, which is much shorter than 12 months for milled rice (Champagne, 2007). Appropriate packaging, low temperature storage, or other interventions can help extend the shelf-life of brown rice.

The impression in the early days that brown rice is cheaper because it is associated with poor quality is no longer the case in the Philippines of late. Short shelf-life, graying niche market, and low supply have raised the price of brown rice. It is ironic that brown rice is now more expensive, and only the economically stable segment of the population can afford to purchase this product. More often than not, health reason is the primary motivation in buying brown rice. Brown rice accessibility is a major problem because it is not readily or conveniently available. Brown rice is usually not sold in the public market or small stores where most Filipinos buy rice, but is instead sold in the higher end supermarkets.

Another problem with brown rice is the presence of some anti-nutrition factors despite being packed with nutrients. These include trypsin inhibitor, hemagglutinin (lectin), oryzacystatin, and allergenic proteins (Juliano, 2010). Fortunately, these anti-nutrition factors are denatured during cooking.

Of major concern is the presence of phytic acid (Fig. 5), which is not destroyed upon heating. Also known as inositol hexaphosphate, phytic acid is the principal storage form of phosphorus in plants. Although it has antioxidant and anticancer properties, phytic acid reduces the availability of essential minerals such as iron and zinc. The lower iron availability in brown rice was shown by Tuntawiroon et al. in 1990 (as cited in Juliano, 2010). Trinidad et al. (2009) further studied the iron absorption in brown rice and milled rice of a local variety and in rice-fish-vegetable diet. In rice alone diet, percent iron absorption was lower in brown rice (5.5%) than in milled rice (10.3%). This was also observed with the rice-fish-vegetable diet wherein the percent iron absorption was poorer in brown rice-based diet at 9.95% than in milled rice-based diet at 13.4%. However, it seems that the higher iron content of brown rice compared with milled rice compensated the low iron absorption resulting in similar amount of absorbed iron for brown rice and milled rice alone diets as well as brown rice-fish-vegetable and milled rice-fish-vegetable diets. It was also noted that the iron absorption was improved by the addition of fish, vegetable, and a source of vitamin C. Iron availability in brown rice should be thoroughly studied as anemia or iron-deficiency is a major concern for certain groups of the population in the Philippines. The overall prevalence of anemia from infants to elderly is 19.5%, with alarmingly high incidence rates of 55.7% and 42.5% for infants (6 months to < 1 year) and pregnant women, respectively. (FNRI, 2010).

On the other hand, the opposite was observed in a study on the bioavailability of zinc from cooked milled, undermilled, and brown rice of Philippine rice variety, PSB Rc14 in rats (Hunt et al., 2002). The total absorbable zinc was higher in brown rice than in milled rice.

Several methods to reduce or neutralize phytic acid in cereal grains were discussed by Coulibaly et al. (2011). These include germination or sprouting, fermentation, and soaking. Another way to address the issue of phytic acid is to breed for low phytic acid mutants in rice (Lang et al., 2007).

Despite the efforts to improve the cooking and eating quality of brown rice and extending its shelf-life, there are still no concrete or practical answers to these problems. The issue on reduced mineral availability due to phytic acid should be considered seriously because of the high incidence of micronutrient deficiency in the country. These concerns must be addressed thoroughly through extensive research in order to break the barriers that prevent the popularization, commercialization, and substantial consumption of brown rice.

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## Tables and Figures

**Table 1.** Nutrient composition of brown rice and milled rice.

Nutrient	Amount per 100 g at 14% Moisture	
	Brown Rice	Milled Rice
Energy Content (kJ)	1520-1610	1460-1560
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
Phytic Acid (g)	0.4-0.9	0.1-0.2
Phosphorus (g)	0.17-0.43	0.08-0.15
Phytic Acid P (g)	0.13-0.27	0.02-0.07
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	9-Jun
Vitamin E, α-tocopherol (mg)	0.6-2.5	<0.10-0.30

*\*adapted from Juliano, 2010*

**Table 2.** Glycemic index of rice and processed rice products with different AC (Juliano, 2010).

Rice Product	Glycemic Index (% of Glucose)	
	Waxy-Low AC (0-18%)	Intermediate-High AC (18-33%)
Brown rice	80 ± 7(4)	58 ± 6(5)
Milled rice	86 ± 6(4)	57 ± 3(20)
Parboiled milled rice	90 ± 8(2)	47 ± 3(15)
Precooked/instant rice	90	91 ± 4(2)
Puffed brown rice cake, molded	86 ± 9(2)	61 ± 5
Noodles/pasta	92 ± 8	50 ± 6(4)

*\*Number of samples in parentheses; GI is based on glucose as 100%*

**Table 3.** Glycemic and insulin indexes of selected foods (adapted from Miller et al., 1992).

Foods	Glycemic Index	Insulin Index
	(Glucose = 100)	(Glucose = 100)
Calrose white	83 ± 13	67 ± 15
Calrose brown	87 ± 8	51 ± 7
Pelde white	93 ± 11	67 ± 11
Pelde brown	76 ± 6	55 ± 10
Pelde parboiled	87 ± 7	57 ± 6
Doongara white (high amylose)	64 ± 9	40 ± 10
Doongara brown (high amylose)	66 ± 7	39 ± 6
Sunbrown quick	80 ± 7	54 ± 6
Waxy rice (0-2% amylose)	88 ± 11	89 ± 19
Rice cakes	82 ± 11	73 ± 12
Rice bran	19 ± 3	23 ± 4
Brown rice pasta	92 ± 8	72 ± 18
Wheat pasta	58 ± 7	52 ± 9
Rolled oats	58 ± 4	54 ± 12
Rolled barley	66 ± 5	64 ± 11

**Table 4.** Grain quality characteristics and Instron hardness of brown and milled rice from Philippine varieties (Corpuz et al., 2009).

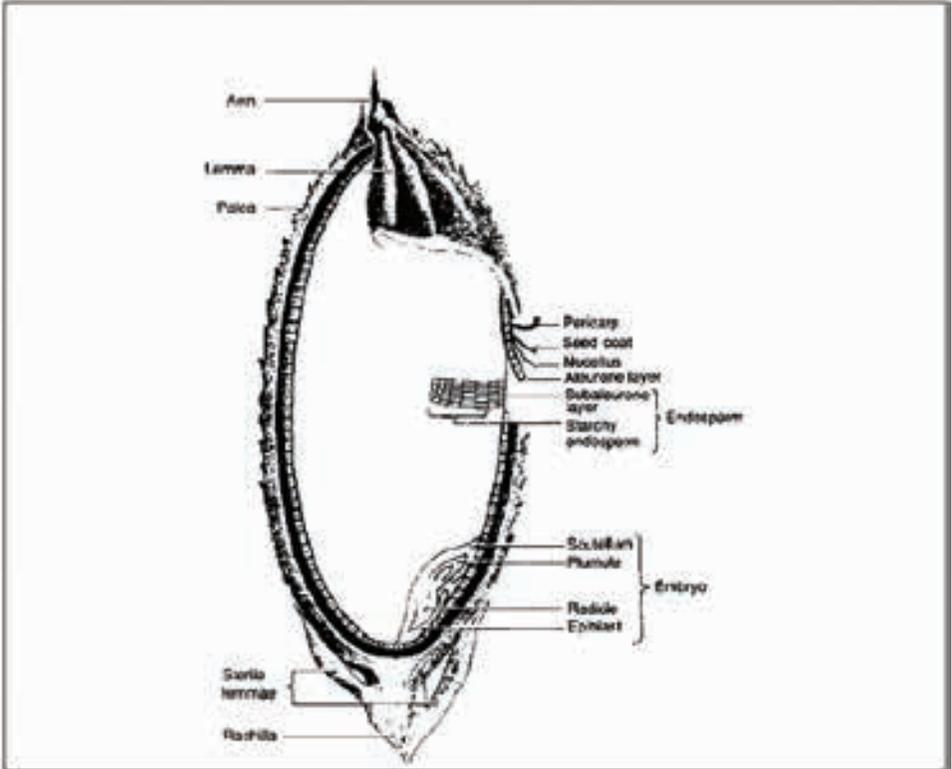
Variety	% Brown Rice	Amylose Content (%)	Gelatinization Temperature	Instron Hardness (kg/cm <sup>2</sup> )	
				Cooked Brown Rice	Cooked Milled Rice
NSIC Rc160	77.1	15.1 L	5.9 L	2.3	1.3
MS6	77.3	16.2 L	6.0 L	2.9	1.5
MS8	75.1	17.0 L	6.4 L	2.4	1.9
PSB Rc28	76.2	18.7 L	3.2 HI	2.8	1.7
PSB Rc18	77.3	19.1 L	5.0 I	2.5	1.6
NSIC Rc130	77.1	19.2 L	4.0 I	2.9	1.7
NSIC Rc150	75.8	19.5 L	4.0 I	2.5	1.6
NSIC Rc154	76.7	21.3 I	4.3 I	2.5	1.9
NSIC Rc144	76.5	21.8 I	4.2 I	2.6	1.7
NSIC Rc142	76.4	21.8 I	4.5 I	3	1.7

*\*Amylose – Low (L), Intermediate (I) - ; Gelatinization Temperature – High Intermediate (HI), Intermediate (I), Low (L)*

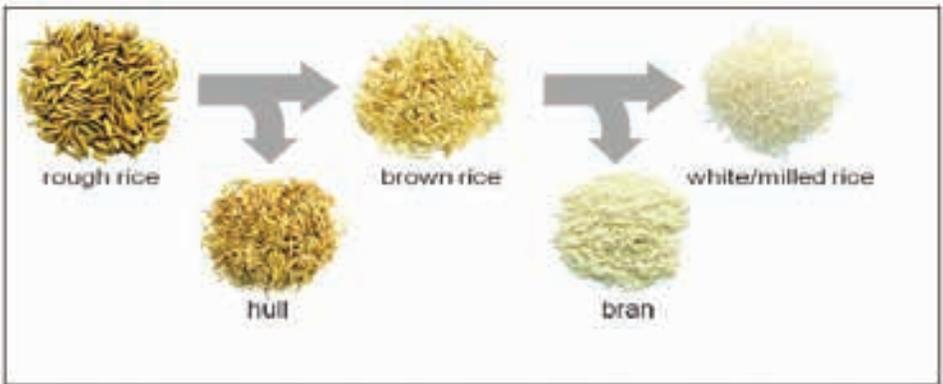
Variety	% Brown Rice	Amylose Content (%)	Gelatinization Temperature	Instron Hardness (kg/cm <sup>2</sup> )	
				Cooked Brown Rice	Cooked Milled Rice
NSIC Rc140	76.7	22.3 I	4.0 I	2.7	1.6
IR 64	77.2	21.5 I	4.0 I	3.1	1.5
NSIC Rc122	77.4	22.0 I	4.1 I	3.1	1.8
PSB Rc72H	75.8	20.2 I	6.5 L	3.3	1.6
PSB Rc82	78.2	20.2 I	4.0 I	3.1	1.8
NSIC Rc128	77.2	21.2 I	6.7 L	2.9	1.6
NSIC Rc148	75.9	21.4 I	6.8 L	3.5	2.5
NSIC Rc134	77.3	23.5 I	7.0 L	4	2.3
NSIC Rc138	78.1	23.6 I	7.0 L	3.5	2.3
NSIC Rc146	75.5	24.3 I	7.0 L	3.6	2
NSIC Rc152	79.5	27.8 H	7.0 L	4	2.7

*\*Amylose – Low (L), Intermediate (I) - ; Gelatinization Temperature – High Intermediate (HI), Intermediate (I), Low (L)*

**Figure 1.** Structure of the rice grain (adapted from Juliano, 1993).

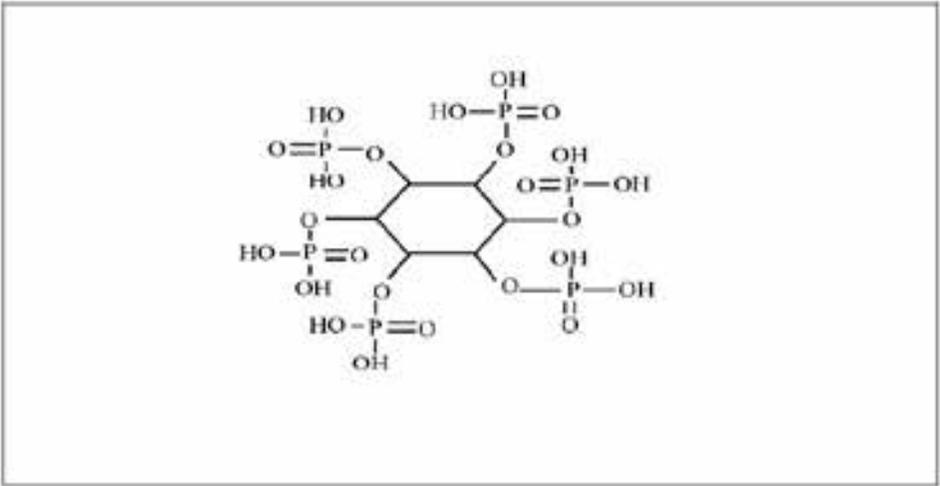


**Figure 2.** Different forms of rice.





**Figure 5.** Structure of phytic acid (adapted from Coulibaly, et al., 2011).



Slide 1:



## **RATIONALE**

**Milled rice is the staple food among Filipinos and is mostly consumed three times a day. Amylose content of milled rice vary.**

**Based on nutritional considerations: BROWN RICE contains dietary fiber aside from its amylose content, and higher vitamin and mineral content in comparison to milled rice .**



**Transcription of Slide 1:**

Milled rice is the staple food among Filipinos and is mostly consumed three times a day. But amylose content of milled rice also vary. Based on nutritional consideration, it was shown that brown rice contains dietary fiber aside from its amylose content and higher vitamin and mineral content in comparison to milled rice.

<sup>2</sup> Scientist from Food and Nutrition Research Institute (FNRI), DOST Compound, Bicutan, Taguig City

## Slide 2: Dietary Fiber

**Dietary Fiber**

(Conventional Definition)

**A non-starch polysaccharide that is not absorbed in the small intestine and can be metabolized in the colon**

(At Step 8 Codex Alimentarius)

**Carbohydrate (CHO) polymers (derived from plant origin) with ten or more monomeric units, which are not hydrolyzed by the endogenous enzymes in the small intestine of humans**



### Transcription of Slide 2:

So, why are we curious about dietary fiber? What is dietary fiber? Actually, our conventional definition, so that we can have a better understanding of dietary fiber, is it is a non-starch polysaccharide that is not absorbed in the small intestine; we have no enzymes to digest dietary fiber; and can be metabolized in the colon. However, nowadays, a new definition of dietary fiber is, it is a carbohydrate polymers with 10 or more monomeric units, which are not hydrolyzed by the endogenous enzymes in the small intestine of humans. So, we can include here other carbohydrates which are not digested in the small intestine. This will also include what we are talking about – resistant starch.

## Types of Dietary Fiber

### Soluble

**CHARACTERIZED BY THEIR VISCOSITY e.g. PECTIN,  $\beta$ -GLUCAN, PSYLLIUM present in apple, oat meal/bran, wheat bran, cereals, rootcrops, other fruits**



### Insoluble

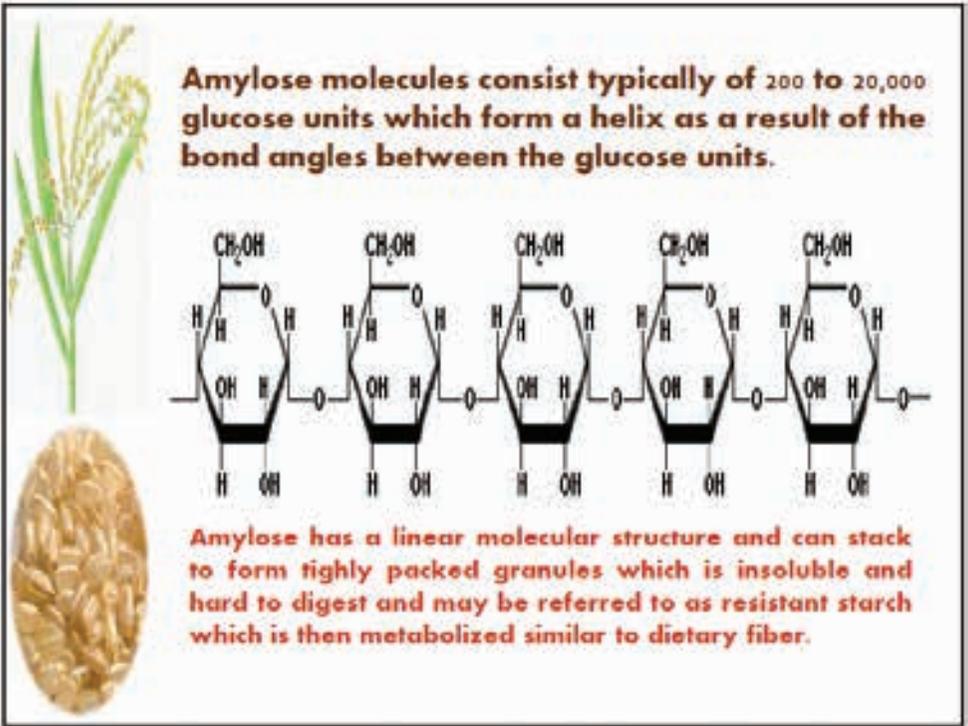
**CHARACTERIZED BY THEIR FIBROUS STRUCTURE: e.g. CELLULOSE, present in fruits and vegetables**



### Transcription of Slide 3:

Actually, there are two types of dietary fiber: the insoluble and soluble. The soluble fiber is characterized by its viscosity, e.g., pectin, glucan, psyllium present in apple, oat meal/bran, wheat bran, cereals, rootcrops and other fruits. The insoluble fiber is characterized by its fibrous structure, e.g., cellulose present in fruits and vegetables.

## Slide 4: Amylose



**Amylose molecules consist typically of 200 to 20,000 glucose units which form a helix as a result of the bond angles between the glucose units.**

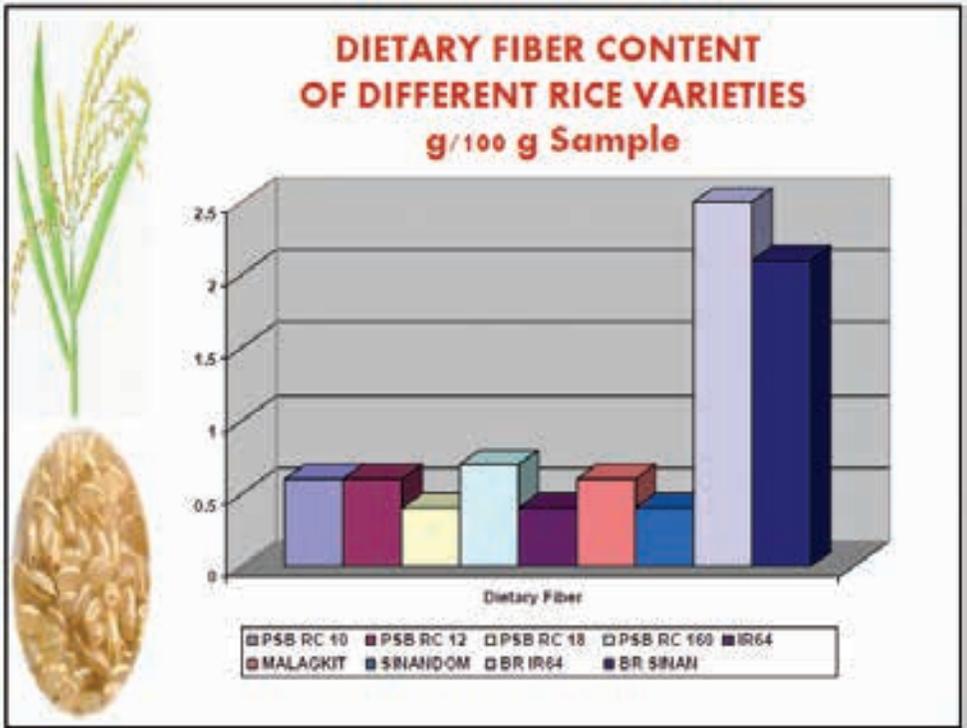
O[C@@H]1[C@H](O[C@@H]2[C@H](CO)O[C@H](CO)O2)O[C@H](CO)O[C@H](CO)O1

**Amylose has a linear molecular structure and can stack to form tightly packed granules which is insoluble and hard to digest and may be referred to as resistant starch which is then metabolized similar to dietary fiber.**

### Transcription of Slide 4:

Now, how about amylose? We mentioned about amylose. Amylose are molecules consisting typically of about 200 to 20,000 glucose units which form a helix as a result of the bond angles between the glucose units. Amylose has a linear structure and can stuck to form tightly packed granules which are insoluble and hard to digest, and may be reffered to as resistant starch, which is then metabolized similar to dietary fiber. That is why the new definition of fiber now includes resistant starch.

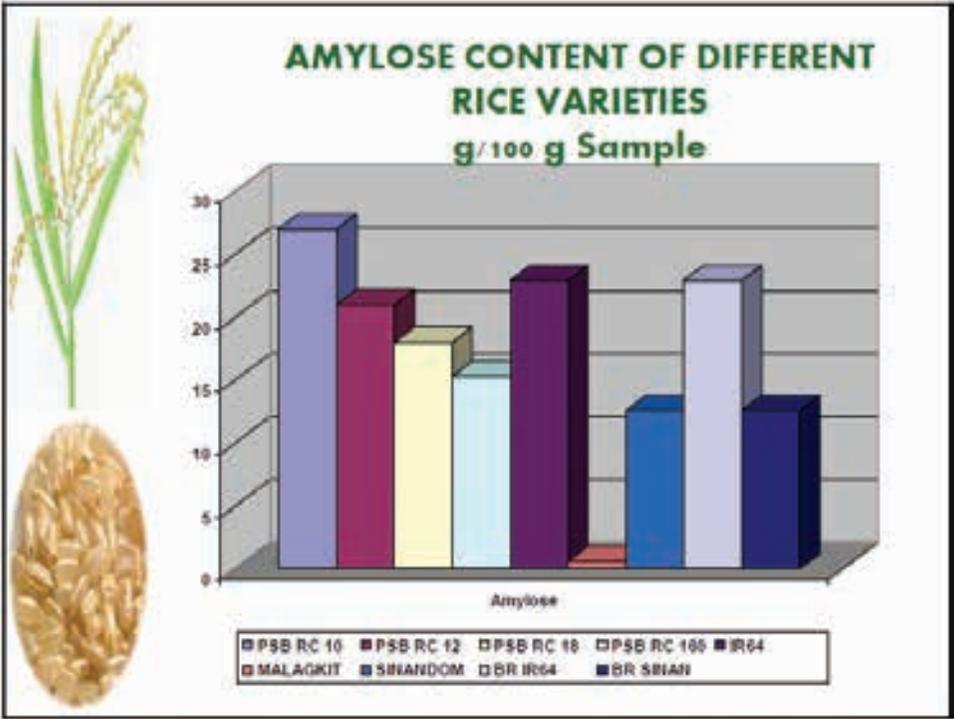
## Slide 5: Dietary Fiber Content of Different Rice varieties



### Transcription of Slide 5:

Now, please study different rice varieties. This is a collaborative study between the Food and Nutrition Research Institute and PhilRice, under the leadership of Dr. Juliano; and for FNRI, yours truly. We studied different varieties: PSB Rc 10, PSB Rc 12, PSB Rc 18, PSB Rc 160, IR 64, Malagkit, Sinandoming, BR IR64, and BR Sinandomeng. So, obviously, all milled rices contain small amount of fiber, while brown rice, you can see here, they are good sources of dietary fiber. We cannot say that they are high fiber because they only contain around 2 plus dietary fiber. So, they are considered as good sources, but not high sources of fiber.

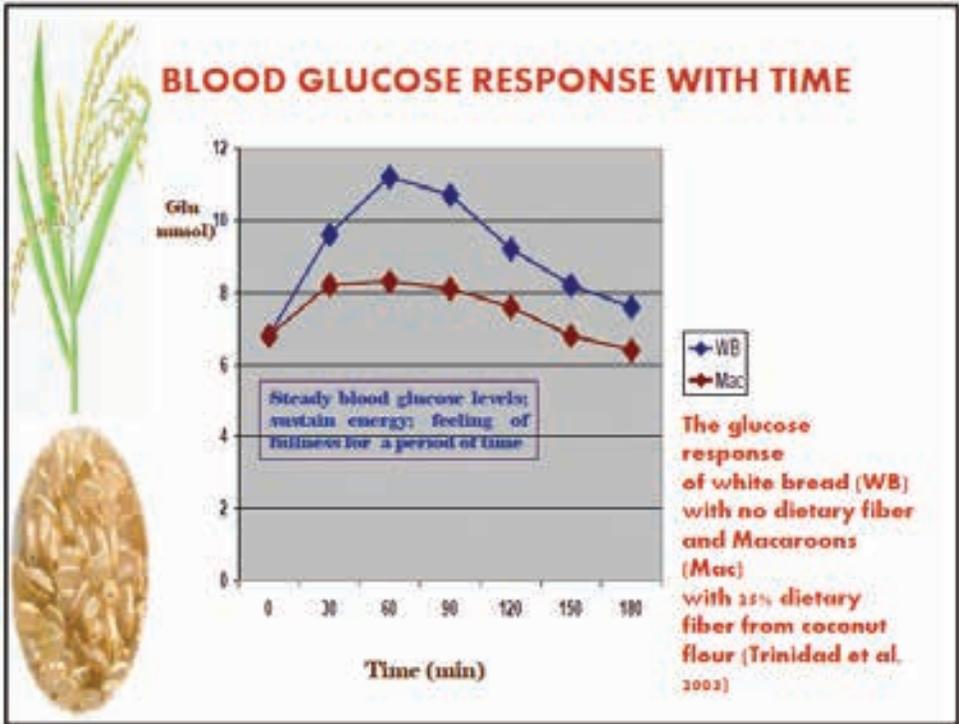
# Slide 6: Amylose Content of Different Rice Varieties



### Transcription of Slide 6:

How about amylose content? There is a variety of amylose content in the milled rice that we studied. The very lowest one, I think, is the malagkit, the waxy rice, and the highest one is the PSB Rc 10. And BR IR64 and BR Sinandomeng are considered to have very low amylose content.

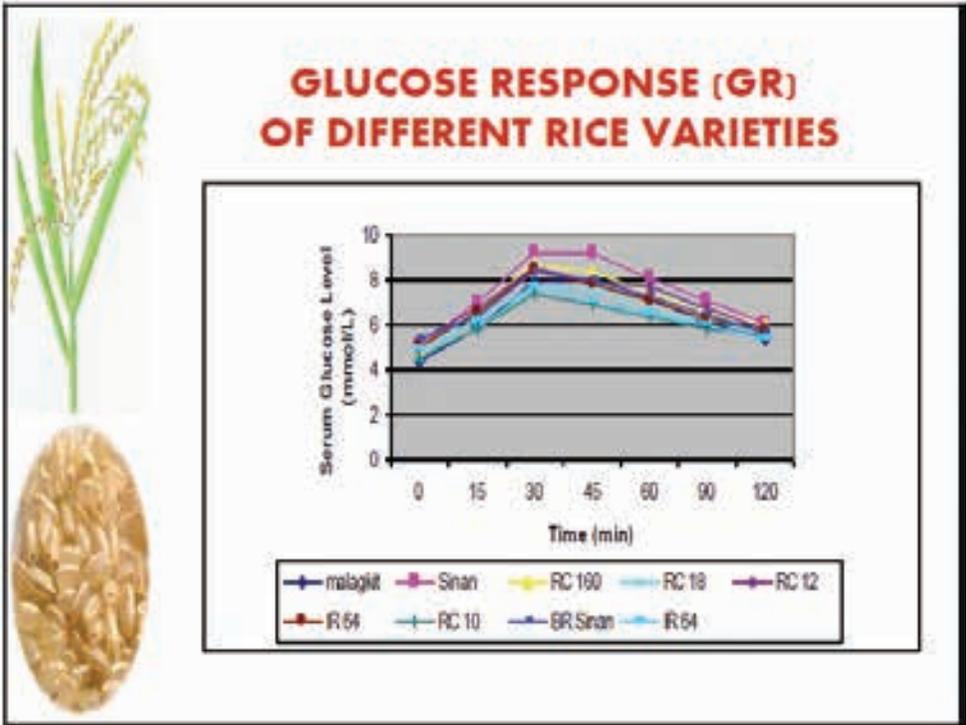
## Slide 7: Blood Glucose Response with Time



### Transcription of Slide 7:

So, why is dietary fiber very important? It is important in preventing the risk of being overweight and obese, and further preventing diabetes. Previous study showed that the glucose response of a high fiber food, for example, in our study on coconut fiber which is present in our *sepal*, we studied that and related it to the glycemic response of white bread. You can see here a very slow release of glucose with time. This is very important because if there is a slow release of glucose, you only need enough insulin to transport your glucose to the cells. Therefore, you maintain your blood glucose. But if the blood glucose is fast, that is the time when you will have a problem because if you don't have enough insulin to transport the glucose to the cells, it will remain in your circulation. It will cause high blood glucose, then further to diabetes, or it can be stored as fats.

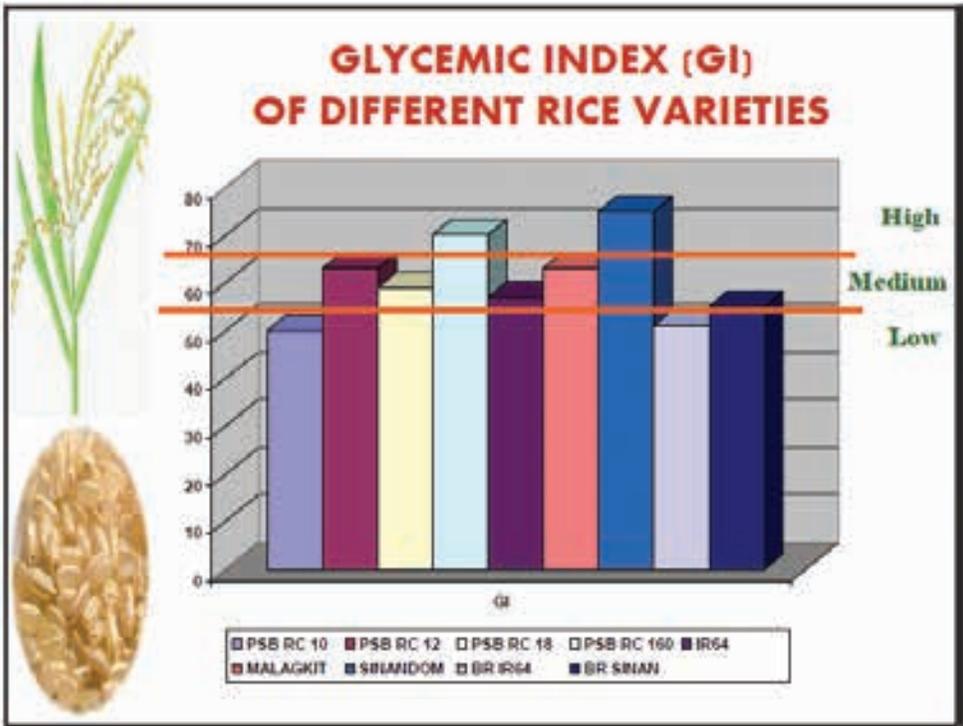
## Slide 8: Glucose Response of Different Varieties



### Transcription of Slide 8:

This figure shows the different glucose responses to the different rice varieties. The low-amylose content Sinandomeng has a very abrupt increase within 30 minutes and abrupt decrease within 120 minutes. In comparison to the high-amylose rice, which is the Rc 10, there is an increase at 30 minutes significantly different from the low-amylose and a slow release up to 120 minutes. The two brown rice that you can see here, the blue one and the light blue, have a very slow release of glucose.

## Slide 9: Glucose Index of Different Rice Varieties

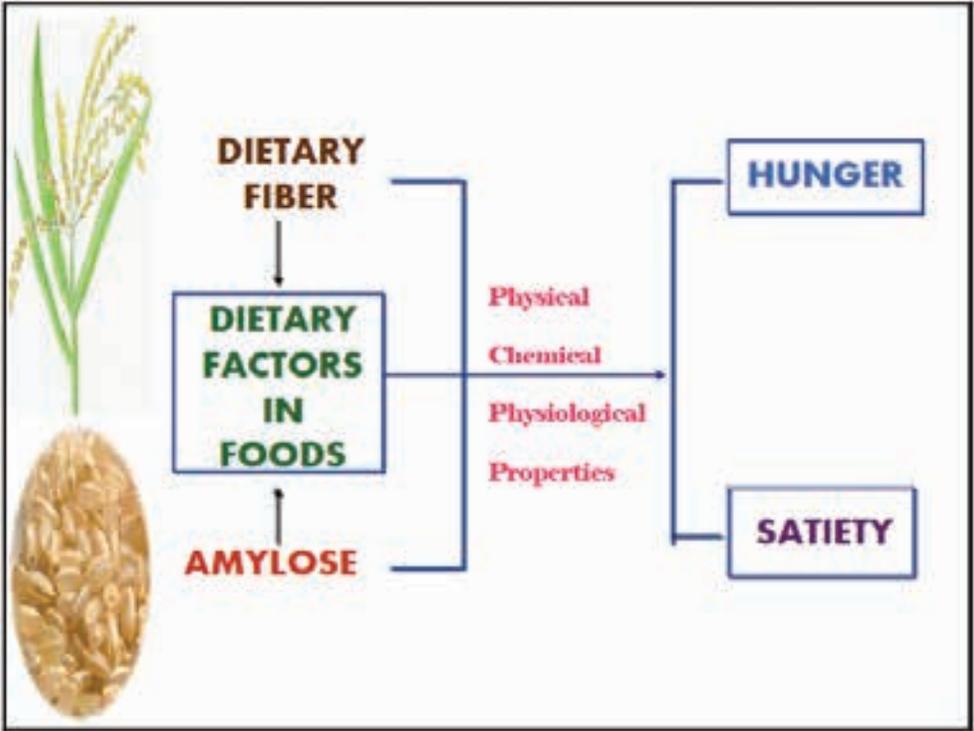


### Transcription of Slide 9:

In summary, the high-amylose Rc10 and the two brown rices – BR IR64 and BR Sinandomeng are considered low-GI foods. While the intermediate amylose content, as you can see here has also low fiber. You can see that they have medium GI, and the low-amylose with a high GI.

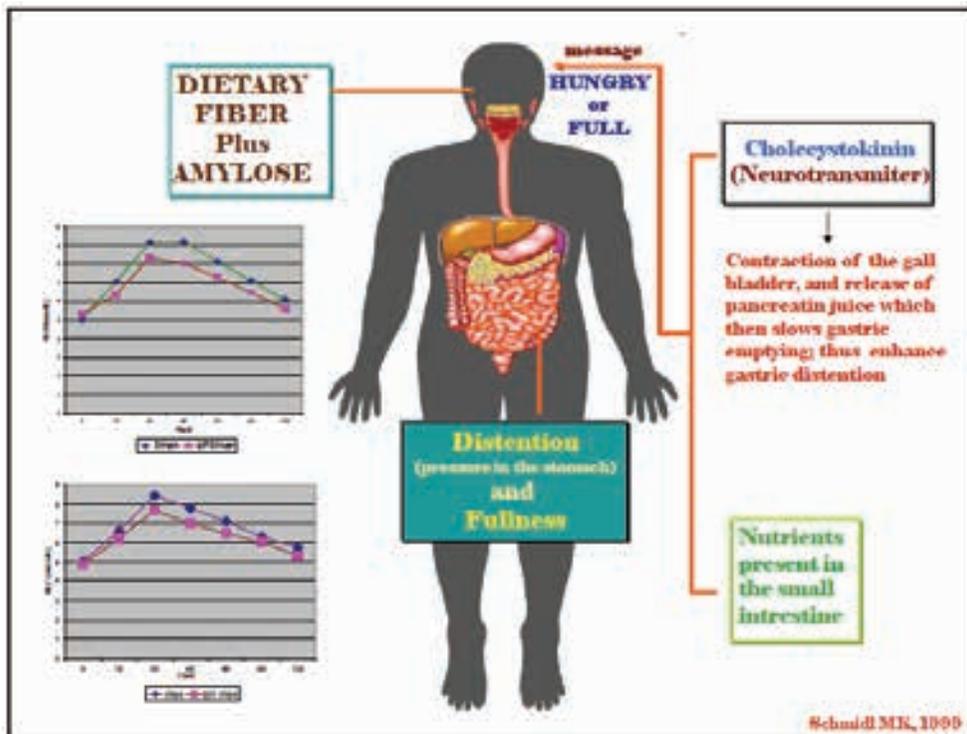


**Slide 11: Dietary Factors in Food**



**Transcription of Slide 11:**

Amylose and dietary fiber that are found in foods; their physical, chemical, and physiological properties may have important implications to hunger and satiety.



**Transcription of Slide 12:**

When you eat food high in fiber plus amylose, it causes distension and fullness in your stomach. During the distension, nutrients present in the small intestine and the neurotransmitter called Cholecystokinin are released. This neurotransmitter causes the contraction of the gallbladder and releases the pancreatic juice which slows gastric emptying, thus enhances gastric distention. And because it is a neurotransmitter, it can dictate to our brain whether we are full or hungry. This can also be validated by the glucose response from *Sinandomeng* alone. *Sinandomeng* milled rice gives us a very high glycemic response. *BR Sinandomeng* and *IR 64* have a very low glycemic response.



**In line with the theme of this workshop on “Mainstreaming Brown Rice to Low- and Middle Income Families”:**

**The combined effect of dietary fiber and amylose present in brown rice may be a potential solution to hunger and satiety in addition to its high vitamin and mineral contents.**

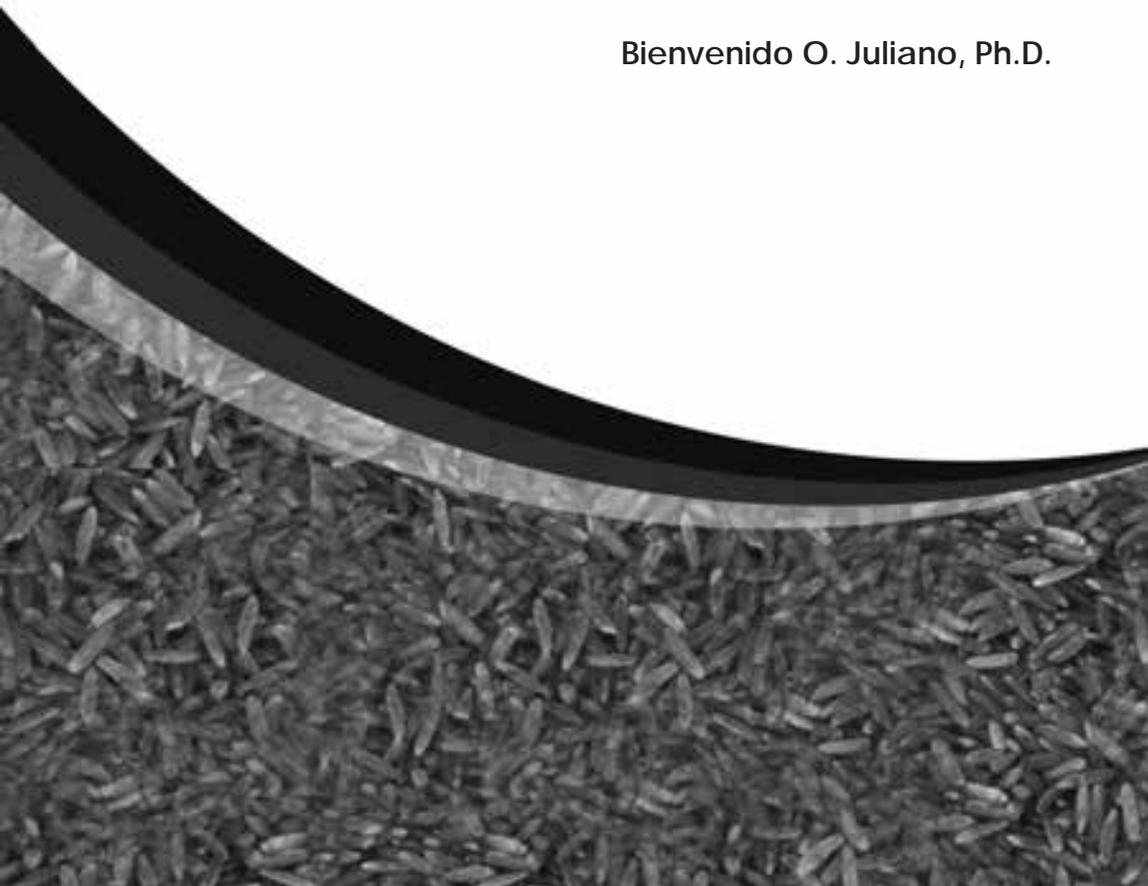
**Intake of rice rich in amylose and/or dietary fiber may be recommended to both children and adults for sustainable needed energy and fullness.**

**Transcription of Slide 13:**

In line with the theme of this workshop, “Mainstreaming Brown Rice to Low- and Middle Income Families”, the combined effect of dietary fiber and amylose present in brown rice may be a potential solution to hunger and satiety in addition to its high vitamin and mineral contents. Intake of rice rich in amylose and/or dietary fiber may be recommended to both children and adults for the needed sustainable energy and fullness. I would like to add in the presentation of Dr. Romero the effect of brown rice or the high fiber and amylose content of rice to cancer. It is because amylose is a resistant starch. Most resistant starch are fermented in the colon to produce what we call short-chain fatty acids. Resistant starch produces more buterate than procunate and acetate, which are the three short-chain fatty acids produced during fermentation in the colon of resistant starch. Resistant starch is a buterate-producing starch and responsible for precenting the risk of colon cancer. Buterate is the food for friendly microorganisms in our large intestine. It can increase the production of these beneficial bacteria that outnumber the pathogens in our colon. It is very important that the rice we eat is high in amylose because of the presence of resistant starch.

# COMPARATIVE NUTRITIVE VALUE OF BROWN RICE AND MILLED RICE

Bienvenido O. Juliano, Ph.D.



# COMPARATIVE NUTRITIVE VALUE OF BROWN RICE AND MILLED RICE<sup>3</sup>

Bienvenido O. Juliano, Ph.D.<sup>4</sup>

## Introduction

Our interest in the Glycemic index and brown rice relates to the fact that with the degrading program, the amylose content of rice has gone down from high to intermediate and is now threatening to cool down the low amylose. Will this aggravate diabetes? What will be the effect on rice consumption?

### Slide 1

#### Comparative composition of 100-gram whole-grain cereals at 14% moisture (USDA 2009)

Cereal	Energy (J)	Dietary Fiber (grams)		Available Carbohydrates (grams)	Crude protein (grams)
		Total	Soluble		
Brown Rice	1,485	3.4	1.3	74	7.6
Wheat, hard	1,360	11.6	2.7	72	10.8
Corn, white	1,465	9.0	1.3	71	9.0
Barley	1,412	9.9	1.7	73	10.3
Oat	1,525	9.9	1.7	62	15.8
Rye	1,360	14.5	4.7	73	9.9
Triticale	1,350	14.0	1.8	70	12.5

After multivariate adjustment for age and other lifestyle and dietary risk factors of 200,000 participants, Sun et al. Arch Intern Med 170:961-969 (2010) estimated that replacement of 50 g cooked milled rice (glycemic index 64%) per day with same amount of brown rice (GI 55%) or other whole grain cereals was associated with lowering the risk of type 2 diabetes in US men and women as follows:

Brown rice 16±6% reduction    Whole grain cereal 36±6% reduction

### Transcription of Slide 1:

Brown rice is not a typical whole grain. Actually, it was only in 2008 when the Food and Drug Administration allowed it to be called whole grain. Although, morphologically it was a whole grain, FDA's definition of whole grain as having 10% dietary fiber, created a big problem because rice was excluded. In the US, they could not claim that brown rice is a whole grain, although morphologically, it is.

<sup>3</sup> Contents came from PowerPoint and transcribed discussion of the author's presentation.

<sup>4</sup> National Scientist and Senior Expert from Philippine Rice Research Institute (PhilRice).

## Slide 2

### Protein, energy, and fat absorption of IR32 brown or milled rice-casein/milk<sup>a</sup> in preschool Filipino children, FNRI-IRRI

Property	Rice-casein		Rice-casein		Rice-milk	
	Brown	Milled	Brown	Milled	Brown	Milled
Children (no.)	6	6	5	5	6	6
N consumed (mg N/kg body wt/d)	250	250	200	200	200	200
True N digestibility <sup>b</sup> (%)	80a	83a	78a	77a	75a	79a
Net Protein Utilization <sup>b</sup> (%)	63a	64a	62a	61a	61a	63a
Apparent energy absorption (%)	90b	93a	90b	93a	90b	92a
Apparent fat absorption (%)	-	-	93b	98a	94b	98a

<sup>a</sup>2/3 of N from rice and 1/3 from casein milk

<sup>b</sup>Allowing endogenous fecal loss of 31 mg N and endogenous urinary N loss of 37 mg N/kg body wt daily. Means of the same diet followed by the same letter are not significantly different at P = 5% by DMRT.

Source: Santiago, et al 1984

#### Transcription of Slide 2:

This is the work done by FNRI in the 1980s. Protein digestibility is almost the same, and energy digestibility is low as you would expect because cell walls are less digested than starch. Apparent fat absorption is also reduced.

**Comparative absorption of fat and other nutrients from brown- and milled-rice diets by five adult Japanese males. Osaka City University (Miyoshi et al 1986,1987ab)**

Property	Low-protein*		Normal protein*	
	Brown	Milled	Brown	Milled
Dietary fiber intake (g/day)	15.0a	6.2b	27.9a	13.7b
Transit time (h)	24.0a	26.2a	27.1a	28.1a
Frequency of defecation/day	1.1a	0.9a	1.0a	1.1a
Weight of dry feces (g)	50.5a	24.5b	54.4a	28.5b
Apparent energy digestibility (%)	89.8b	96.0a	89.3b	94.4a
Apparent protein digestibility (%)	48.4b	68.0a	72.7b	79.6a
Apparent fat digestibility (%)	78.6b	94.9a	74.1b	94.7a
Fat fecal excretion (g/day)	10.8b	2.3a	12.1b	2.5a
Apparent calcium absorption (%)	22.0a	26.1a	14.3a	30.4a
Apparent phosphorus absorp'n(%)	14.6b	65.4a	37.1b	58.8a
Apparent magnesium absorp'n(%)	14.2a	19.6a	7.8a	17.4a
Apparent potassium absorption(%)	34.5b	87.1a	60.0b	80.3a
Apparent sodium absorption (%)	80.9b	92.3a	86.7b	90.8a

\*Rice alone at 0.5 g and rice-egg-chicken diet with 1.2 g protein/kg body wt daily.  
 Means of the same diet followed by the same letter are not significantly different by LSD.

Source: Miyoshi et al 1986,1987ab

**Transcription of Slide 3:**

This is the only study that looked into fecal transit time. Because of the low fiber content of rice, with the substitution of brown rice for milled rice; the fiber intake is higher as expected. The transit time was lower but not significant. The weight of feces doubled and the energy digestibility went down. As expected, the protein digestibility also went down, but what was interesting is that the fat digestibility went up. The fat content of feces was actually five times higher. Among the elements, phosphorus, potassium, and sodium went down due to the phytic acid.

## Glycemic index $\pm$ SEM of cooked brown and milled rices.

Authors/Variety	Brown	Milled
Panlasigui (1989); Panlasigui & Thompson (2006) Univ Toronto		
Waxy	Tapol 79 $\pm$ 8a	IR65 81 $\pm$ 16a
High AC IR42 10 normal Can. subjects	58 $\pm$ 8a	66 $\pm$ 7b
IR42 9 diabetic Filip. subjects	39 $\pm$ 9a	61 $\pm$ 8b
Brand-Miller et al (1992) Univ Sydney		
Low AC Calrose 8 normal subjects	87 $\pm$ 8a	83 $\pm$ 13a
Low AC Peide 8/7 normal subjects	76 $\pm$ 6a	93 $\pm$ 11b
High AC Doongara 8 normal subjects	66 $\pm$ 7a	64 $\pm$ 9a

### Transcription of Slide 4:

Literatures are silent on glycemic index. Dr. Panlasigui in her PhD thesis showed that brown, milled, and glutinous rices have the same high glycemic index but the high amylose rice showed lower glycemic index for brown rice. Brand miller also showed this trend.

## Slide 5

### Glycemic and satiety properties of cooked *Sinandomeng* and IR64 rice in Filipinos, FNRI-UPLB-Philrice LB, 2011.

Property	<i>Sinandomeng</i> (13% AC)		IR64 (23%AC)	
	Brown	Milled	Brown	Milled
Water-raw rice ratio for similar hardness	1.8	1.2	2.0	1.5
Instron hardness (kg/cm <sup>2</sup> )	1.7a	1.8a	1.8a	1.8a
Water content (%)	57.7	55.9	57.6	58.9
Available carbohydrates (%)	36.6	39.8	36.4	37.0
Total dietary fiber (%)	2.1	0.4	2.5	0.4
Wt of rice with 50 g available CHO (g)	145	127	147	137
Glycemic index $\pm$ SEM (9-10 subjects) (%)	55 $\pm$ 3a	75 $\pm$ 5b	51 $\pm$ 2a	57 $\pm$ 3a
Satiety - Cooked rice intake (g)				
Test meal (50 g available CHO)	146	133	148	134
Post-meal (2 hr after test meal)	188	194	212	212
Total	334a	327a	360a	346a
Satiety quotient (mm/J) (Drapeau et al 2005)				
Hunger	2.5a	2.7a	1.7a	3.0a
Fullness	-2.2ab	-2.2ab	-1.3b	-3.9a

Means of the same variety followed by the same letter are not significantly different at P=5% by LSD. Glycemic index: low  $\leq$  55%, medium 56-69%, high  $\geq$  70%.

#### Transcription of Slide 5:

But as shown by Dr. Trinidad, glycemic is actually lower in brown rice. Brown rice actually reduced glycemic index significantly. But what was surprising is that this trend will show in satiety. We will propose a project to PhilRice involving four rice samples representing high amylose, intermediate amylose, low amylose, and glutinous rice in milled and brown rice forms. We have to extend the period to lunch to show greater differences in satiety because this study was done only up to *meryienda* (snacks). Right now we cannot really say whether there will be an increased or reduced rice consumption by substituting brown rice for milled rice.

## Slide 6

### Methanol-soluble phenolics and protein digestibility and Net Protein Utilization of raw pigmented and nonpigmented brown and milled rice in five growing rats<sup>a</sup> (Eggum et al 1981)

Variety	Phenolics		True Protein		Net Protein	
	(% Catechin)		Digestibility (%)		Utilization (%)	
	Brown	Milled	Brown	Milled	Brown	Milled
Perurutong (blk)	0.62c	0.07a	72.4a	97.5b	59.1d	66.7b
H4 <sup>b</sup>	0.25b	0.05a	83.0d	99.2a	66.6b	65.2c
IR8 <sup>b</sup>	0.02a	0.02a	97.1b	95.2c	70.6a	70.3a
IR32	0.01a	0.01a	96.9bc	98.4a	66.7b	66.4b

<sup>a</sup>Means followed by the same letter are not significantly different at P = 5% by DMRT.

<sup>b</sup>Milled rice rat data from Eggum et al (1973).

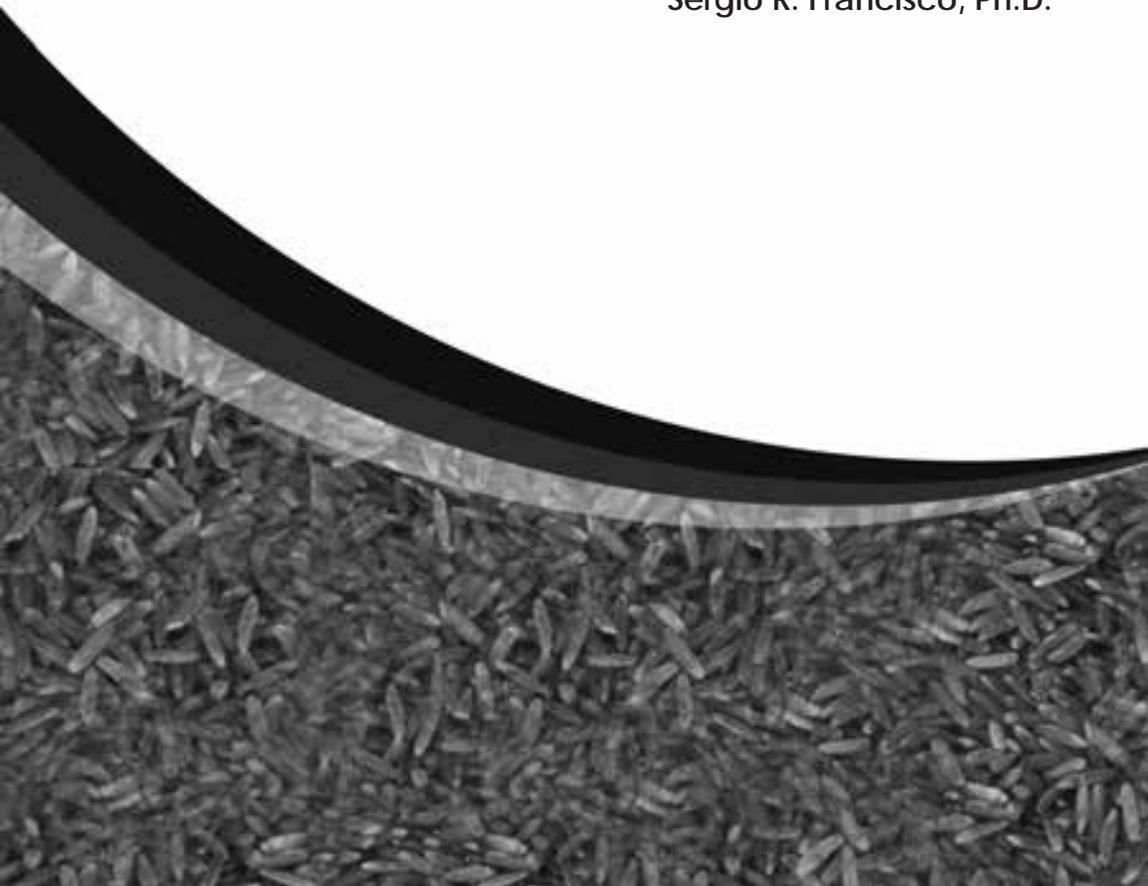
#### Transcription of Slide 6:

Lastly, on pigmented problem, an old data from Dr. Eggum in 1981 showed a reduced protein digestibility in rice with high pigment. We have to be on the look-out to make sure the good and quality effect of glycemic index on some properties. In conclusion, brown rice is better than milled rice but it should never be compared with other whole grain cereals because of its lower fiber content. Everybody knows that oats lower high blood pressure, due to its soluble fiber content. In the case of rice, the factor is actually the unsaponifiable matter of fat. Brown rice fat is not effective anymore for cardiovascular diseases.



# IMPLICATIONS OF BROWN RICE TO SELF-SUFFICIENCY

Sergio R. Francisco, Ph.D.



## IMPLICATIONS OF BROWN RICE TO SELF-SUFFICIENCY

Sergio R. Francisco, Ph.D.<sup>5</sup>

Rice self-sufficiency has always been the goal of the Philippine government. Since the 1960s, the Department of Agriculture (DA) has developed and implemented various rice production programs towards the realization of this goal. Though these efforts have raised rice production, harvest is still short of the total consumption of the country as population and Per Capita Rice Consumption (PCRC) increased unabatedly. This resulted in the perennial importation of rice.

### Efforts to increase production

Increasing production can be attained through either increasing the area planted and/or improving yield. However, the area for rice production is becoming limited. The irrigated rice area currently occupies about 67% of the total harvested area and contributes 75% to the total production. It would also be hard to increase the rice production areas because of problems such as soil salinity, high cost of development, water scarcity, and alternative and competing uses of water. Thus, increased productivity on a time scale has to make a major contribution across ecosystems. This may be attained through promotion of more advanced production technologies in the farmers' field.

These issues are being addressed by the Philippine government through the DA and its attached agencies like the Philippine Rice Research Institute (PhilRice). PhilRice constantly pursues varietal development, nutrient, water and pest management, and other technologies to help farmers raise their production.

However, technology adoption is still slow due to many factors ranging from biophysical and socioeconomics, thus, preventing farmers from realizing the full productivity-increasing effect of technologies. This has resulted in the large gap between yields from experimental and farmer's fields.

### Trends in production and consumption

Data shows that rice production is generally increasing for the past two decades. Production grew at 2.2% per year (Figure 1) in 1990-2000. This rate further increased to 3.8% in 2000-2008. However, production declined in 2009 and 2010. Consequently, production growth was reduced to 2.96% in 2000-2010. Nevertheless, production has been generally growing from 1990 to 2010.

Figure 1 also shows that the production growth rate cannot cope up with the demands due to unabated population growth. Further, the gap between local supply and demand for rice has been increasing.

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## Per capita rice consumption

Reported documents showed increasing domestic rice consumption in the country. Based on the Supply and Utilization Accounts (SUA), the per capita Net Food Disposable (NFD) for rice, which approximates the PCRC, increased from 92.53 kilograms in 1990, per capita NFD to 128.10 kilograms in 2008. However, it dropped to 119.92 kilograms in 2009 (Figure 2).

Direct measurements of PCRC are available from the results of Food Consumption Surveys (FCS) of the Bureau of Agricultural Statistics (1995, 2000, and 2009), and Food and Nutrition Research Institute (1993, 2003 and 2008). Results of these surveys show upward trend for PCRC estimates (Figure 3).

Since production cannot cope up with the demand, producing more out of a given volume of *palay* is another avenue we can explore to reduce our import dependence.

Increasing rice output for a given volume of *palay* can be attained by improving milling recovery. Brown rice production rather than complete polishing (or white rice production) can be an answer to this problem.

### What is brown rice?

Brown rice, popularly known as *pinawa* in Tagalog, is unpolished rice produced by removing only the hull or husk. The bran that is retained in the grains gives brown color to this rice. It becomes white when the bran layer is stripped off in the polishing process.

Brown rice offers significant levels of protein and essential vitamins and minerals. The proximate analysis of brown rice shows that brown rice is loaded with protein, micronutrients, and dietary fiber (Table 1). It has also been reported that brown rice contains high phytic acid, an antioxidant and known to protect people prone to kidney stones by reducing urinary calcium, but diminishes the availability of essential minerals such as iron, phosphorus, and calcium. Unfortunately, 15% of protein, 85% of fat, 90% of calcium, 75% of phosphorus, 80% of thiamine, 70% of riboflavin, and 68% of niacin are removed from the grains during the polishing process (Javier, 2004).

### Implications to self sufficiency and importation

Increase in rice supply per kilogram of *palay* is another advantage of brown rice relative to polished or white rice. Postharvest researchers say that the milling recovery in brown rice is 10 percentage points higher than polished or white rice. Taken on a national scale, this percentage increase in milling recovery is a substantial boost to food supply.

To illustrate this point, scenario calculations were done to determine the impact of consuming brown rice rather than white rice (Table 2). Data during

the last 5 years of production and consumptions were used in the calculations. Scenarios analysis involved calculations for: a) brown rice consumption once a month; b) twice a month; c) thrice a month; and d) once a week. It is assumed that the milling recovery for brown rice is 75%.

### *Effect on Importation*

A substantial reduction in imports will be realized if consumers will occasionally shift to eating brown rice. If consumers would have eaten brown rice once a month, rice importation could have been reduced by an average of 50.8 thousand mt per year (Table 2). Importation could have been further reduced if consumers would increase frequency of consumption. At 72 days per year consumption of brown rice, the average reduction in import is about 304.8 thousand mt per year.

### *Effect on Government Savings*

The reduction of importation as a result of occasional switching of consumption from white rice to brown rice has also implications to import spending and foreign exchange savings. Table 3 presents a summary under different scenarios. At a frequency of 12 days per year consumption of brown rice, the average savings in importation is USD20.32 million (or PhP812.81 million) yearly. If consumption frequency is increased to 72 days per year, estimated savings will be USD121.92 million (PhP4.87 billion). This savings could had been used to fund other productivity enhancing programs or other government projects.

### *Energy Savings*

In addition to import reduction and foreign exchange savings, energy is another savings that could be realized in brown rice consumption. The fuel savings in milling would be about 50% because the polishing and whitening steps are eliminated. As a consequence, milling time is also shortened. It can also be deduced that there would be lesser investments in machinery since polishers and whiteners are not necessary anymore.

## **Summary and Recommendations**

Historically, consumption out-phased production due to inadequate area devoted to production, agroclimatic factors, and low adoption of technological innovation due to socioeconomic constraints faced by farmers. Hence, the government always resorted to importation to feed its fast growing population. Given this situation, managing our production in terms of producing more rice out of a given volume of *palay* is another avenue we can explore to reduce our import dependence. Increasing rice output for a given volume of *palay* can be attained by improving milling recovery. Brown rice production rather than complete polishing or white rice production can be a possible solution to the problem.

Besides the nutritional advantage of brown rice compared to white rice, it also offers economic benefits to society. Occasional shift from the usual white rice consumption can have a substantial effect in reducing importation and increasing the level of self-sufficiency. This in turn reduces our spending on rice importation and savings on foreign exchange, which the government can use to other programs. In addition, there would be savings on energy for milling and cost of milling equipment.

Brown rice also have a problem. Although, brown rice has high phytin, which is a strong antioxidant, it also reduces iron absorption in the body. Other constraints to brown rice adoption are short shelf-life, longer cooking time, and affordability. However, these constraints can be easily addressed by R&D.

Given the advantages and benefits of brown rice, aggressive promotion needs to be pursued, while at the same time addressing the constraints that may hinder acceptance. The promotional campaign should be carried out at both the supply and demand side in collaboration with various sectors of the society to include local governments, schools, hospitals, hotels, civic associations, and at the national level through nutritional and other relevant organizations.

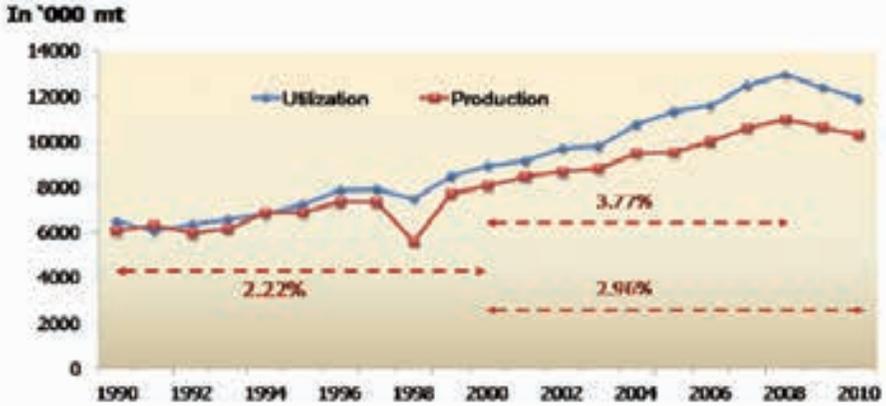
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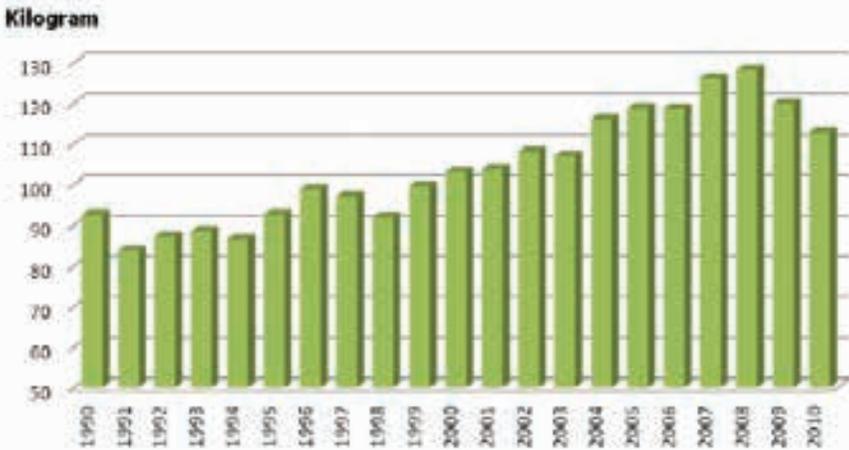
Department of Agriculture (DA). 2012. Food Staples Sufficiency Program 2011-2016. Office of the Secretary-DA, National Rice Program, Quezon City, Manila.

**Figure 1. Trends in Production and Consumption, 1990-2010**



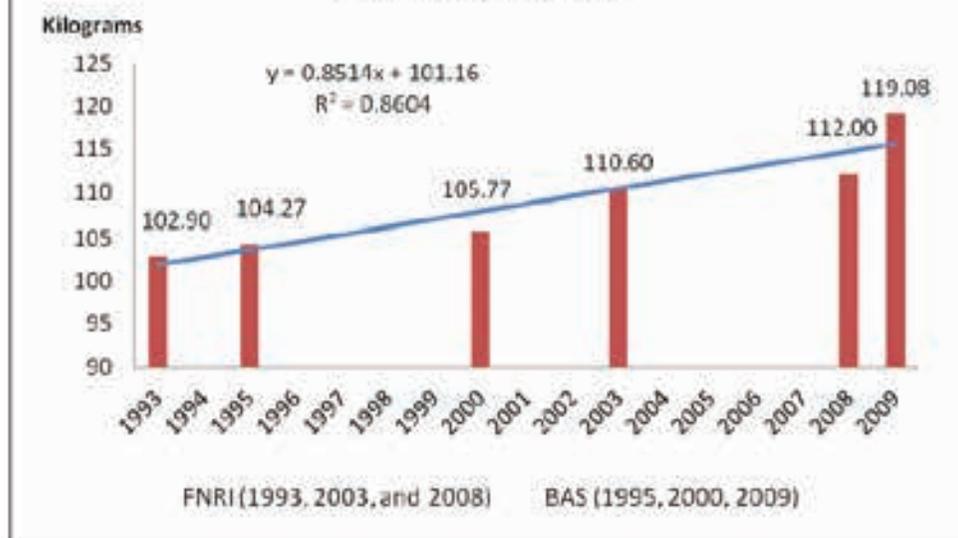
Source of basic data: PhilRice-BAS compiled data

**Figure 2. Annual Per Capita Rice Consumption based on Supply and Utilization Accounts (SUA) Framework, 1990-2010.**



Source of basic data: BAS

**Figure 3. Annual per capita consumption of rice, Philippines, 1993-2009.**



**Table 1.** Proximate analysis of brown and white rice.

Particular	Brown Rice	White Rice
Crude protein, g/100g	7.1-8.3	6.3-7.1
Crude fat, g/100g	1.6-2.8	0.3-0.5
Crude fiber, g/100g	0.6-1.0	0.2-0.5
Available carbohydrates, g/100g	73-87	77-89
Neutral detergent fiber, g/100g	2.9-3.9	0.7-2.3
Thiamine, mg/100g	0.29-0.61	0.02-0.11
Riboflavin, mg/100g	0.04-0.14	0.02-0.06
Niacin, mg/100g	3.5-5.3	1.2-2.4
$\alpha$ -tocopherol, mg/100g	0.90-2.50	0.075-0.30
Calcium, mg/100g	Oct-50	30-Oct
Phosphorous, g/100g	0.17-0.43	0.08-0.15
Phytin P, g/100g	0.13-0.27	0.02-0.07
Iron, mg/100g	0.2-5.2	0.2-2.8
Zinc, mg/100g	0.6-2.8	0.6-2.3

Source: Juliano, 1994.

**Table 2.** Volume (in '000 MT) of savings from imports at various frequency of brown rice consumption.

Year	Frequency of consumption (days per year)					
	12	24	36	48	60	72
2006	48.4	96.7	145.1	193.5	241.8	290.2
2007	51.3	102.5	153.8	205	256.3	307.6
2008	53.1	106.2	159.3	212.3	265.4	318.5
2009	51.5	103	154.5	206	257.6	309.1
2010	49.8	99.6	149.3	199.1	248.9	298.7
<b>Average</b>	<b>50.8</b>	<b>101.6</b>	<b>152.4</b>	<b>203.2</b>	<b>254</b>	<b>304.8</b>

Source of basic data: Bureau of Agricultural Statistics

**Table 3.** Savings in government spending on rice imports at various frequency of brown rice consumption.

Year	Frequency of consumption (days per year)					
	12	24	36	48	60	72
<b>Million USD</b>						
2006	19.35	38.69	58.04	77.38	96.73	116.07
2007	20.50	41.01	61.51	82.02	102.52	123.02
2008	21.23	42.47	63.70	84.94	106.17	127.40
2009	20.60	41.21	61.81	82.42	103.02	123.63
2010	19.91	39.83	59.74	79.65	99.57	119.48
<b>Average</b>	<b>20.32</b>	<b>40.64</b>	<b>60.96</b>	<b>81.28</b>	<b>101.60</b>	<b>121.92</b>
<b>Million PhP</b>						
2006	773.80	1,547.60	2,321.41	3,095.21	3,869.01	4,642.81
2007	820.15	1,640.31	2,460.46	3,280.61	4,100.77	4,920.92
2008	849.36	1,698.71	2,548.07	3,397.42	4,246.78	5,096.14
2009	824.19	1,648.37	2,472.56	3,296.75	4,120.93	4,945.12
2010	796.53	1,593.06	2,389.59	3,186.12	3,982.66	4,779.19
<b>Average</b>	<b>812.81</b>	<b>1,625.61</b>	<b>2,438.42</b>	<b>3,251.22</b>	<b>4,064.03</b>	<b>4,876.83</b>

Note: Price per mt of rice in world market assumed to be 400USD; 1USD:40PhP exchange rate

## Appendices: Basic data used in the scenario analysis.

**Appendix Table 1.** Domestic production and imports, 2006-2010.

Year	Domestic Production			Imports
	Palay	Brown rice	White rice	
2006	15,327	11,495	10,024	1,716
2007	16,240	12,180	10,621	1,805
2008	16,816	12,612	10,997	2,432
2009	16,266	12,200	10,633	1,755
2010	15,772	11,829	10,315	2,378

Source: Food Staples Sufficiency Program, 2012, and own computation.

**Appendix Table 2.** Estimated volume ('000 MT) of brown rice consumed at various frequency scenarios.

Year	Frequency of consumption (days/year)					
	12	24	36	48	60	72
2006	377.92	755.84	1,133.76	1,511.68	1,889.59	2,267.51
2007	400.44	800.89	1,201.33	1,601.77	2,002.22	2,402.66
2008	414.63	829.26	1,243.89	1,658.52	2,073.15	2,487.78
2009	401.09	802.18	1,203.27	1,604.36	2,005.45	2,406.54
2010	388.91	777.81	1,166.72	1,555.63	1,944.53	2,333.44

**Appendix Table 3.** Estimated volume ('000 MT) of domestically produced rice consumed at various frequency scenarios.

Year	Frequency of consumption (days/year)					
	12	24	36	48	60	72
2006	329.56	659.11	988.67	1,318.22	1,647.78	1,977.34
2007	349.18	698.37	1,047.55	1,396.73	1,745.92	2,095.10
2008	361.55	723.09	1,084.64	1,446.18	1,807.73	2,169.27
2009	349.58	699.16	1,048.73	1,398.31	1,747.89	2,097.47
2010	339.12	678.25	1,017.37	1,356.49	1,695.62	2,034.74

## Discussion on Dr. Francisco's paper

Discussant: Jaime Tadeo<sup>6</sup>

Isang mabiyayang araw sa inyong lahat! Isa pong karangalan na maging bahagi ninyo, bilang mag-aaral ng brown rice. Sa aming mga taga-Bulacan, dahil ako'y taga-Bocaue, ang tawag namin sa kayumanggi ay hindi sunog, hindi hilaw, kayumangging kasarapan. Mula noong mag-engage ako sa organic farming, hindi naman kaila sa inyong lahat na chemical agriculture is a major contributor to global warming and climate change kaya kinakailangan tayong tumulong para mapalamig ang daigdig. Sustainable agriculture is the future of the planet. Small-scale, sustainable farmers are cooling down the earth. Ang pagkasira ng ating lupa bunga ng pagdating ng IRRI nung 1960, limampu't-isang taon na, soil fatigue, pagod na pagod na yung ating mga lupa. At ang nitrous oxide, 40% ang contribution nito sa global warming. Natatakot lang ako na ang pagkagunaw ng mundo ay tao na ang maging dahilan dahil sinisira natin ang ating kalikasan.

*A blessed day to all of you. It is my honor to be a part of this brown rice workshop. In our place in Bulacan, because I'm from Bocaue; we don't call any "brown" as toasted or raw; instead we call it "deliciously brown" since I engaged in organic farming; I think you already know that chemical agriculture is a major contributor to global warming and climate change, that is why we need to help cool-down the earth. Sustainable agriculture is the future of the planet. Small-scale, sustainable farmers are cooling down the earth. Our soil was devastated since IRRI came here in 1960. Fifty-one people, soil fatigue, our soil was already exhausted. Nitrous oxide contributes 40% contribution to global warming. I'm terrified that the end of the world will be caused by people who continuously destroy our environment.*

Ngayon po, ako ay 73 years old. Limang dekada na akong nagsasaka sa palayan. At noong 2004, nagising ako sa *natural healing at organic farming*, nagsimula na rin akong kumain ng *brown rice*. Pag ako'y kumain ng *brown rice*, ni butil nito na malaglag ay walang nasasayang; ang pinggan ko'y malinis, lahat ng gilid ay hindi pinapabayaan. Mula noon, ang aking maybahay at ang aking pamilya ay kumakain na ng *brown rice*. Magandang makita nyo muna ang ilang *observation*. Ang aking suki sa pagtitinda ng *brown rice* ay limang doktor. Bakit kaya gusto ng doktor ang *brown rice*? Si Dr. Susan Valiente kilala nyo sa *natural healing*? Kasama ng sibol na gulay pangpalakas ng apdo at atay, kasama ng *leafy vegetables* o madahong gulay, pangpalakas ng puso at maliit na bituka. Pagkatapos ay ang bungang-gulay, pangpalakas ng *pancreas*, ng *spleen* at sikmura, at ang butong-gulay na ang buto ay kakorte ng baga, pangpalakas ng baga at malaking bituka, at ang ugat na gulay, root crops, pangpalakas ng bato, pangpatigas sa lalake, pampabasa sa babae.

<sup>6</sup> Leader of the National Rice Farmers Council of the Philippines.

*Today, I'm 73 years old. It is already five decades since I started rice farming. In 2004, I'm awakened with the natural healing and organic farming. I also started eating brown rice. It is better that you see first some observations. My loyal customers are five doctors. Why do these doctors love brown rice? Do you know Dr. Susan Valiente of natural healing? Sprouted vegetables strengthen the gallbladder; leafy vegetables strengthen the heart and small intestines. And fruit-vegetables strengthen the pancreas, spleen, and stomach. Beans strengthen lungs and large intestines. Rootcrops strengthen the kidney and boost the libido of both males and females.*

Ang unang pag-aaral doon ay unpolished rice. Sinasabi po na nung kumakain tayo ng pinawa, yung binabayong bigas natin kanina, walang Pilipinong may diabetes. Pero naturuan tayo ng “plistine???” White,” lahat ng Pilipino may diabetes. Ang sabi nila, kasi ito ang natira Ka Jimmy, yung polisher o whitener ang natira ay carbohydrates. Pag kinain mo ang carbohydrates, magiging asukal. Ito ho ay isang dokumentong sinulat ng mga kaibigan kong aktibista, si Robin Rood, isang propesor sa Amerika, si John Cavana, “Why Billions Eat Unhealthy Rice?” Dito po napalathala yung pag-aaral sa Harvard University, na napalathala naman sa New York Times. Na kapag five times ka kumain sa isang linggo ng white rice, makakatiyak ka na magkakaroon ka ng Type 2 Diabetes kaysa sa minsan lang isang buwan. lisa ang aking babae at apat na lalake. Yung aking anak na babae tatlo ang anak, masasakitin, laging nagtatae, laging nilalagnat, laging may sipon. Pinag-combine nya ang white at brown rice, naging malusog, lumakas at lumaki, hindi na nagtatae, hindi na masasakitin, hindi na nilalagnat, hindi sinisipon. Sabi ng manugang ko, tatay, ayoko na ng hindi brown. Naging regular ang aking pagdumi, ang pakiramdam ko lagi akong malakas. Ang maganda, yung aming aso, 1998 pa, gaano katanda yun? Ang pinakakain namin ay yung brown rice. Nakakuha ako ng makina kay Engr. Bautista paggawa ng brown rice. Yung mga durog ang pinapakain ko. Sabi ng mga veterinarian, matanda na kailangan na mamatay, saksakan na lang natin para mamatay na nang hindi nakakaawa. Eh nung pakainin namin ng brown rice, bumata, nagulat ang mga anak ko, bakit bumata ang mga aso at napakaganda ng mga balahibo. Sapagkat ang brown rice ay mayroong minerals that supply essential nutrients to the hair, sa ating ngipin, kuko, muscles, at sa ating bones kaya eto po ang ilang observations para makita kung gaano kahalaga.

*The first study conducted was on unpolished rice. It was said that before that when we still ate “pinawa” (ground rice), Filipinos had no diabetes. But when “plistine white” was introduced, more Filipinos had diabetes. They said that the polisher or whitener turned into carbohydrates. If carbohydrates are digested, it will turn into sugar. This was the documents written by my activist friends: Robin Rood, a professor in America; John Cavana, author of “Why Billions Eat Unhealthy Rice?”. This was broadcast in Harvard University and published in New York Times. If you eat white rice five times a week, it is assured that you will have Type 2 diabetes than eating white rice*

*once a month. I have a daughter and four sons. My daughter has three children; all are sickly and weak, prone to diarrhea, fever and colds. Now, everytime she feeds her children, she combines white and brown rice. Her children became healthy. My son-in-law told me that he doesn't like white rice anymore; instead he already prefers brown rice. In eating brown rice, he developed a stronger body and his bowel movement became regular. Also, like what happened to our dog who was born in 1998, think about how old he is now. We feed our dog with brown rice. I got a milling machine for brown rice from Engr. Bautista. The broken rice were the ones I feed to my dogs. The veterenarians said that our dog is too old and that he is dying. They said that it is better that they perform euthanasia for the dog to die immediately so that he will not suffer anymore. But, when we fed our dog with brown rice, he regained his youthfulness again. My children were shocked why the dogs regained their youthfulness and have healthy furs. It is because brown rice has minerals that supplies essential minerals to the hair, teeth, nails, muscles, and bones. These are some observations for us to see the importance of brown rice.*

Iniisip ko tuloy na kung ang lahat ng Pilipino ay gagamit ng brown rice, wala ng malnourished na bata. Isipin natin ang ating lifespan, dagdagan yung mga gulay na sinabi ko, aabutin na tayo ng kagaya ng Japan, mga 100+, hindi tulad sa atin na 67 – 68. Kapag kumain tayo ng brown rice at ng mga gulay na nabanggit ko, isipin ninyo, tayo ay magiging sports powerhouse sa region, world-class ang ating mga atleta.

*I just thought that if all Filipinos eat brown rice, there will be no more malnourished children. Think of our lifespan. If you eat more vegetables, we can reach the maximum lifespan in Japan of about 100+. Unlike here, the average lifespan of people are only 67-68 years old. If we eat brown rice and vegetables that I mentioned, we can be a sports powerhouse in the region because of our world-class athletes.*

Bilang nagtatanim ng palay, na may negosyo ng brown rice, ang sa akin po kasi kung bakit malulutas na ang problema natin sa rice shortage at hindi na tayo aangkat ng bigas. Ito po ang computation ng hamak na magbubukid: per capita (consumption) ay bababa, milling recovery ay tataas equals rice self-sufficiency. Ang per capita ng Bureau of Agricultural Statistics, 119. Ang per capita ng DOST, 112. Ang per capita ng NSO, 106. Ang sabi ni Robin Rood at John Cavana, dahil mas marami ang calorie ng brown kaysa sa white, laging full ang stomach. 360 ang kanyang calorie per 100 grams, pwede mo ngayon ibaba ang per capita. Tingnan po natin ang total consumption vs. total production. Ang populasyon natin ay 94 million x per capita ang total consumption. Imultiply po natin ang 119 x 94 million, makakakuha tayo ng 11,186,000,000 (11.2 million). Pero kailangan din nating magpatuka sa manok, sa bibe, feeds. Ang pangangailangan natin, 600 metric tons. Eh yung ating mga bibingka, kakanin, 400 metric tons. Eh yung binhi, 200 metric tons. Eh paano ngayon yung all-time stock natin at 30 days? 30 days times 30,000 ang

ating konsumo bawat araw, kailangan natin ngayon ang 2.1 na karagdagan sa 11. Ang total consumption natin ay 11.2 million. Ang total production, 2007 record - 16, 240, 000. Milling recovery, 65%. Makakakuha tayo ng 10.5 million. Pero ang Intercity, ang milling recovery nila doon ay 58-60% lamang. Kung ang total consumption natin at 13.2 million, ang milling recovery mo sa 16 million ay 10.5 million, meron kang shortfall na 2.7 million, kaya umaangkat tayo. Pero kung ang gagamitin mo ang milling recovery ng Intercity na 58-60%, 9.7 million lang ang makukuha mo. Ibig sabihin, ang magiging shortfall natin ay 3.5 million. Pero may tiyak na sa isang buwan laging may stock. Ngayon, kung ibababa mo ang per capita times 94 million people, ang total consumption, hindi pa kasama ang sinabi kong feeds, processing and seeds, ang kabuuan lang na consumption natin ay 9.4 million, idagdag mo yung processing, bibingka, kakanin, patuka sa manok, sa bibe, ang kabuuan ay 1.9. Ang total consumption natin ay 11.3 million, imultiply ngayon ang 16,237,000 na 2007 record ng total palay production, gamitin ang milling recovery ng makina na binigay ng kaibigan kong si Engr. Bautista ito ang record: ang milling recovery ko ang pinakamababa ay 70%, ang pinakamataas ay 89%. Kung ang gamitin ay ang 70% milling recovery, 11.3 million total consumption at total production ay 16.237 million metric tons, hindi na tayo mag-iimport, self-sufficient na tayo. Bababa ang per capita dahil busog kaagad sa isang tasa ng brown rice, tataas ang milling recovery. Makikita natin na ang solusyon talaga ay brown rice.

*As a rice farmer and a businessman of brown rice, in my opinion, we can already solve our problem on rice shortage and not import rice anymore. Here is my computation as a rice farmer: Per capita consumption will decrease, milling recovery will increase equals rice sufficiency. The per capita consumption of Bureau of Agricultural Statistics (BAS) is 119 kg/year; Department of Science and Technology (DOST), 112 kg/year; and National Statistics Office (NSO), 106 kg/year. Robin Rood and John Cavana said that, because brown rice have high calories compared to white rice, we can easily experience fullness in our stomach. With brown rice's 360 calories per 100 grams, we can now decrease per capita consumption. Try to check the total consumption vs. total production. Our 94 million population multiplied by per capita consumption:  $119 \text{ kg/yr (per capita consumption)} \times 94 \text{ million (total population)}$ , equals 11,186,000,000 (11.2 million kg) total consumption. But we also need to a lot feeds for chicken and ducks (600 mt), rice cakes "bibingka" (400 mt), and seeds (200 mt). How about our all-time stocks for 30 days?  $30 \text{ days} \times 30,000$  equals our daily consumption. Now, we need 2.1 additional for 11. Our total consumption is 11.2 million; our total production in 2007 is 16,240,000 (mt) and the milling recovery is 65%. Now, we can get 10.5 million metric tons, but the intercity milling recovery is 58-60% only. If our total consumption is 13.2 Mmt/year, the milling recovery in 16 million is 10.5 Mmt/year; we have a shortfall of 2.7 Mmt that is why we still Import rice. But if we use the milling recovery of Intercity at 58-60%, you can only get 9.7 Mmt. This means that we will have a shortfall of 3.5 Mmt, but we can assure that there will be stocks for a month. Now,*

*if we decrease the per capita consumption x 94 million people, the total consumption (excluding feeds, processing, and seeds) is only 9.4 million. When we add processing, rice cakes “bibingka”, and feeds, the total is 1.9. The total consumption of Filipinos is 11.3 Mmt/yr. Multiply that with 16,237,000 mt total production in 2007 using the milling recovery of the milling equipment of Engr. Baustista, and the result was: the milling recovery is minimum 70% and 89% maximum. If I use the milling recovery of 70%, 11.3 Mmt/year total consumption, and 16.237 Mmt total production, there is no need to import rice because we will be rice sufficient. Per capita consumption will decrease because eating 1 cup of brown rice will easily make our stomach full and milling recovery will increase. As you can see, the only solution is brown rice.*

Yung mga constraints, short shelf-life, pag mahusay ang pagpapatuyo mo, 14% ang moisture content, tama ang storage facility, lighting and ventilation, may dala ako, isang taon nang hindi nasisira. Eh si Dr. Mamaril sabi niya, huwag kang oorder ng mas marami sa kailangan mo. May paraan si Dr. Mamaril, ilalagay mo sa freezer for 24 hours, good for 6 months. Pangalawa, sinasabing longer cooking time. Magdadagdag ka lang ng 5 minutes. Paano yung pagpapatubig? Ang tubig, nakita ninyo ang rice cooker, may guhit. Kung gusto ninyong maligat, doon lang sa guhit. Kung gusto ninyong malambot, magdagdag ka ng isang guhit. Yung affordability naman, bakit nga ba mahal? Sa bawat 50 kg palay, 70% milling recovery, makakakuha ka ng 35 kg. Sa 50 kg ng white, ay 60% makakakuha ka ng 30 kg. Ibebenta ko sa inyo ang brown ko ng 30 para naman affordable. Ang 30 x 35, 1050. Binili ko yung palay sa magsasaka ng PhP17, iyon 850, tutubo na ako ng 200. Yung gastos, hatiin mo na lang ang 200. Hindi na masama yun dahil kumita ka ng 100. Eh yung white na 30 lang ang nakuha mo dahil 60% milling recovery, ang margin mo lang 50, nandoon pa ang gastos mo. Talaga pong hindi na tayo mag-iimport pag brown. Hindi ka mag-iimport ng white, dahil hindi ka makakakuha ng brown. Ang gagawin ngayon ng NFA lahat ng produktong palay ng magsasakang Pilipino, bibilhin niya tapos maglalagay siya ng mga rice mill. Nakausap ko ang magsasaka ng Thailand at Vietnam, sabi nila, bakit naman kami kakain ng pangit na bigas, lahat ng pangit na bigas naming, kayo ang bumibili, which is unfit for human consumption, ireremill ng NFA ngayon.

*Those constraints such as short shelf-life, perhaps if it was only well-dried at 14% moisture content, with proper storage facility, lighting and ventilation, brown rice can be stored up to one year. Dr. Mamaril said don't purchase more than what you need. Dr. Mamaril has a way of storing it. Just put it in the freezer for 24 hours and it is good for 6 months. Second, brown rice has longer cooking time. Just add another 5 minutes in your usual cooking time for it to cook. How about the amount of water in cooking brown rice? When you want it chewy, just add water up to the line indicated in the rice cooker. But, if you want it soft, add more water one line above the indicated line. How about the affordability of brown rice? Why is it quite expensive? It is because in every 50 kg of paddy rice at 70% milling recovery, you*

*get 35 kg of brown rice. In comparison to white rice at 60% milling recovery, you only get only 30 kg. I will sell my brown rice at ₱30/kg for it to become affordable. The ₱30 x 35 kg = ₱1,050. I bought paddy rice from the farmer at ₱17/kg; and 50 kg at ₱850/sack. I only have ₱200 profit. Plus other expenses, just divide the ₱200. Not bad, I still have ₱100 net profit. But with white rice, you only get 30kg/sack due to 60% milling recovery. You only have a margin of ₱50, excluding the other expenses. We really don't need to import if we use brown rice. You will not import white rice because you will not get brown rice. National Food Authority (NFA) should now buy all the rice farmers' produce and it should distribute rice mills to them. I talked to rice farmers in Thailand and Vietnam. They said why should they eat low quality rice? All of their low quality rice was being exported to the Philippines, which is unfit for human consumption. Now, the NFA will remill those imported low quality rice again.*

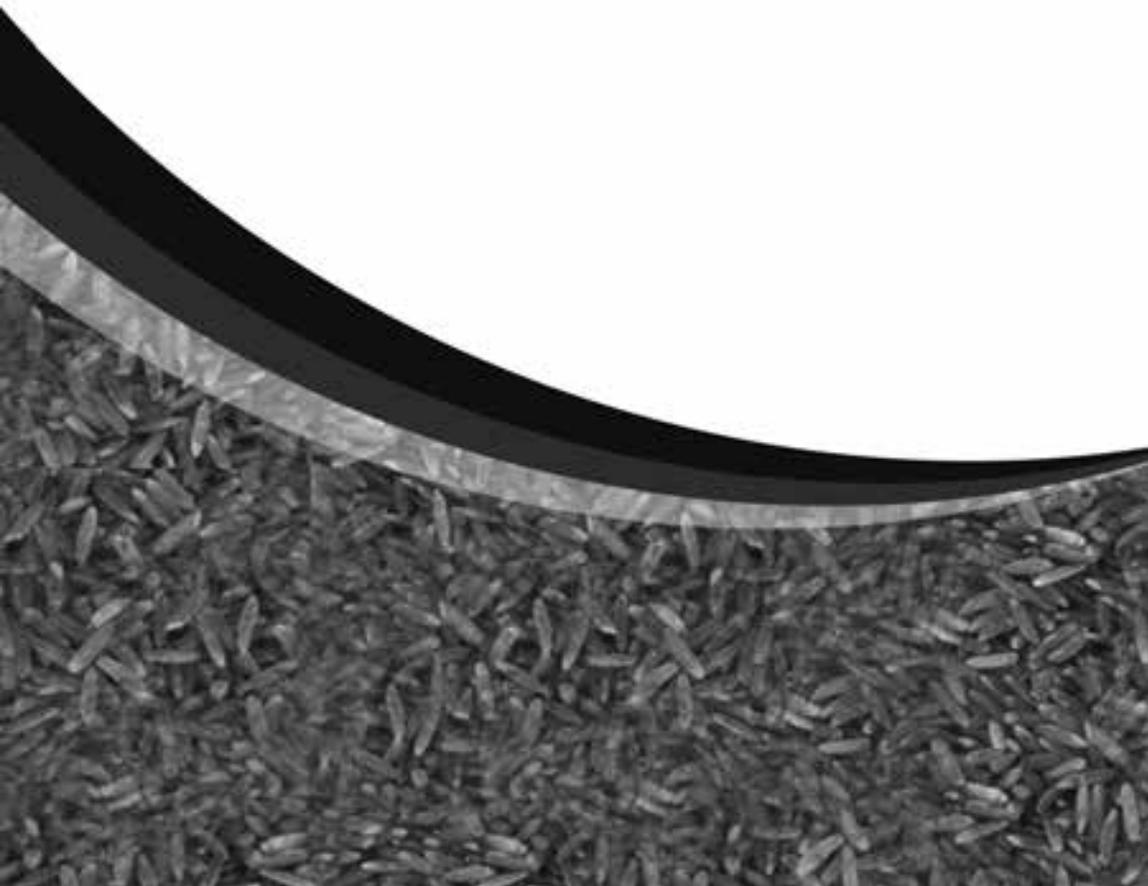
Makatitayak po tayo na self-sufficient na tayo, mag-brown rice production lamang tayo. Ang sambayanang Pilipino, marerevolutionize ang kalusugan, wala ng malnourished, wala ng may diabetes.

*We can assure that we will be self-sufficient if we only engaged in brown rice production. The Filipino people then will evolutionize health. No more malnourished and diabetic Filipinos.*



# WAYS TO IMPROVE ACCEPTABILITY OF BROWN RICE TO CONSUMERS

Henry M. Corpuz



## WAYS TO IMPROVE ACCEPTABILITY OF BROWN RICE TO CONSUMERS

Henry M. Corpuz<sup>7</sup>

Brown rice is a whole grain cereal. Any rice, including long-grain, short-grain, sticky, nonwaxy, and pigmented rice may be eaten as brown rice. Brown rice is produced by removing only the hull or husk using a mortar and pestle or rubber roller (dehuller). The bran not removed during dehulling gives the grain a brown color. It becomes milled or white rice when the bran layer is stripped off in the polishing process (Fernandez, 2003). In the early 1950s, Filipinos only consumed brown rice, was then popularly known as “pinawa” among the Tagalogs. However, consumer’s preference shifted to white or milled rice when fast and efficient milling machines were invented and introduced. Brown rice is relatively superior to milled rice in terms of nutritional value and health benefits. Similar to other whole grain cereals, it contains higher amount of various nutrients like vitamin B complex, vitamin E derivatives (tocols) and oryzanols, fat, protein, minerals, and fiber, including phytochemicals and antioxidants (Juliano, 2007).

Whole grain cereals and whole grain products are gaining popularity nowadays due to mounting clinical evidences that regular intake of such products is associated with reduced risks of chronic diseases such as cardiovascular diseases, diabetes, and cancers. This is also one of the reasons why consumption of brown rice is being revived and promoted in the country. Despite nutritional advantage and health benefits, brown rice remains unappealing to some because of the following reasons:

- 1) Brown rice requires longer cooking time compared to milled rice, and its grains tend to separate and hard when cooked;
- 2) Brown rice has short shelf life under normal storage conditions; and
- 3) It contains higher amount of antinutrition components (phytic acid).

This paper reviews the different processing methods and technologies that have been studied by researchers to address the above mentioned problems on brown rice in order to improve its quality and increase its acceptability among consumers.

### **Ways to reduce the cooking time and hardness of cooked brown rice**

Brown rice is considered a whole grain cereal because the bran layers and embryo still adhere on the starchy endosperm. The bran portion is primarily responsible for the unacceptable qualities of brown rice in raw (storability) and cooked (eating quality) forms. The waxy and oily properties of the bran prevent the rapid penetration of water into the grain during cooking. This results to slow hydration rate and hard grain texture due to incomplete

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gelatinization of the starchy endosperm. Brown rice grains normally take 45 to 50 minutes to completely cook compared to only 15 to 20 minutes for milled rice. Moreover, the texture of brown rice tends to be hard, separated, and chewy when cooked.

Some households blend brown rice with equal amount of milled or white rice to improve its eating quality. Later, the amount of added milled rice may be reduced until they get accustomed to the taste and texture of cooked brown rice. This is also one of the possible strategies to encourage young children to eat brown rice. Varietal screening was conducted by Corpuz et al., (2010) to identify the rice varieties suited for brown rice production and consumption. Rice varieties with low amylose content would produce relatively softer cooked brown rice grains compared to other nonwaxy rice varieties. However, the Instron hardness values of cooked brown rice from these varieties are still harder than their cooked milled rice counterpart. However, there are several processing methods studied by researchers to further reduce the cooking time and improve the eating quality of brown rice. Such methods include soaking, light polishing, ultrasonication, and flour-blasting of brown rice grains.

### **Soaking treatment**

In Asian countries, rice is usually soaked in water before it is cooked to improve the eating quality of the cooked grains. The main purpose of soaking is to achieve quick and uniform water absorption. The bran in the brown rice grains prevents the entry of water into the endosperm. Therefore, most of the absorption happens near the embryo and the periphery of the grains (Horigane et al., 2006). Del Mundo et al. (2001) suggested soaking of the brown rice in water for 30 minutes prior to cooking using 1:2 brown rice:water ratio to achieve a much softer cooked grains. Corpuz et al. (2010) evaluated the effects of different soaking periods (0.5, 1.0 and 12 hr) commonly practiced by consumers in reducing cooking time and hardness of cooked brown rice.

A slight decrease was observed in the cooking time of brown rice samples (1 to 3 minutes) soaked at different periods. Overnight soaking (12 hrs) had the shortest cooking time, but may lead to fermentation of the soaked grains and produce unpleasant odor. Cooked brown rice hardness also decreased with increasing soaking time. A 7 to 27% reduction in the cooked brown rice hardness was noted after soaking the grains for at least 30 minutes or longer. The observed improvement on brown rice quality can be attributed to the fissure and cracked formation during soaking, which facilitated the infusion of water into the grains during cooking.

Sometimes warm soaking water is also used to shorten soaking time. Han and Lim (2009) showed that brown rice (*japonica type*) soaked at higher temperature (50°C) exhibited faster and higher amounts of water absorption than grains soaked at lower temperature. They found that the soaking times

needed to obtain 20 and 30% moisture (from initial moisture content of 11%), respectively, were 2 and 24 hr at 250C, whereas only 1 and 2 hr at 500C.

The cooked brown rice grains that had been soaked at 30% moisture content were softer than those soaked at 20% moisture content. There was no significant difference on the hardness of cooked brown rice soaked at low and high low temperatures to attain 20% moisture content. For samples with 30% moisture content, however, the hardness value of cooked brown rice soaked at 500C for 2 hrs was significantly lower than those soaked at 25°C for 24 hrs. Therefore, not only moisture content but also soaking temperature affected the texture of cooked brown rice. The higher hardness of cooked rice with lower moisture content (20%) might have resulted from insufficient water absorption or less homogeneous water diffusion during soaking. According to Thakur and Gupta (2006), different soaking temperatures (30 vs. 60°C) significantly affected the extent of water diffusivity into rice kernels.

Thus, increasing soaking temperature and moisture content facilitated water diffusion into the grains and starch gelatinization during cooking, resulting in softer cooked grains (Han and Lim, 2009).

### **Ultrasonic treatment**

Cui et al. (2005) tried producing quick cooking brown rice by investigating the effect of ultrasonic treatment at different temperatures on cooking time and cooked brown rice quality. Ultrasonic treatment has been explored for many food processing applications. Generally, high-amplitude waves (10 kHz to 1 MHz) are best suited for applications such as cleaning, drilling, emulsification, and chemical and biological applications. Tang et al. (2005) reported that ultrasonic treatment could degrade cellulose material by changing the morphology of cellulose fibers. If the particles subjected to sonication are rice grains in water, then some destructions of the surface “shell” and grain fragmentation would be anticipated (Mason and Paniwnyk, 1996).

Medium grain brown rice was ultrasonically treated in water at temperatures of 25, 40, and 55°C for 30 min, and then dried by air at 25°C to its initial moisture content ( $11.0 \pm 0.6\%$ , wb) before cooking. Results showed that the optimal cooking times were 37, 35, and 33 mins after treatment at 25, 40, and 55°C, respectively, compared to the control of 39.6 min. Although the cooking times of treated brown rice were significantly reduced, they were still much longer than that of milled rice (24 mins). The water uptake ratio and volume expansion ratio of milled rice were also higher than those of brown rice, which indicated that milled rice still has better cooking properties.

Scanning Electron Microscopy (SEM) images of the brown rice surface revealed that ultrasonic treatment made the rice bran lose its natural morphology, allowing water to be absorbed by the rice grain easily, particularly at high temperature treatment. The reduced cooking time could have been

due to improved water absorption indicated by the higher water uptake ratio. Thus, ultrasonic treatment could also be used for reducing cooking time of brown rice. The tested high ultrasonic treatment temperature lowered the gelatinization temperature and improved the viscosity of rice flour from treated brown rice. Meanwhile, no data were reported on the improvement of the texture of cooked brown rice.

### **Light polishing method**

Brown rice is usually polished from 30 to 45 sec to produce milled or white rice. Corpuz et al. (2011) subjected NSIC Rc160 (low amylose type), IR64 (intermediate amylose type), and NSIC Rc152 (high-amylose type) brown rice grains to different light polishing times (1 to 11 sec) to partially scrape off the surface bran layer. Results of cooking time determination revealed that lightly polished grains had significantly shorter cooking time compared with the unpolished brown rice (Table 1). Reduction of cooking time of NSIC Rc160, IR64, and NSIC Rc152 brown rice ranged from 0.13 to 6.0, 2.20 to 8.89, and 3.80 to 10.26 minutes, respectively. Light polishing treatment also improved the texture of cooked brown rice grains. When cooked in 1:2 rice:water ratio, Instron hardness of cooked grains of partially polished brown rice reduced by 22 to 63%, 35 to 71%, and 33 to 60% for NSIC Rc160, IR64, and NSIC Rc152, respectively. However, light polishing can also reduce the crude protein, fat, ash content, and antioxidant activity of the samples due to removal of some bran layer.

### **Flour-Blasting method**

Recently, Guraya (2011) evaluated the effectiveness of flour-blasting method in producing quick-cooking brown rice with improved eating quality. Flour-blasting is derived from the word sandblasting. Instead of using sand, brown rice grains were bombarded with parboiled rice flour (120  $\mu$ m particle size) at 413 kPa air pressure to create tiny holes or microperforations on water resistant bran layers. Parboiled rice flour was used as it is harder and breaks into sharp edges compared to regular rice flour. Also, the presence of residual amounts of parboiled rice flour should not be a problem on the treated product.

Similar to other methods, flour-blasting procedure can be utilized to shorten cooking time and reduce the hardness of cooked brown rice. Cooking time of all flour-blasted brown rice samples was reduced to 25 minutes compared to 50 minutes for the untreated brown rice. Also, the relative hardness of flour-blasted brown rice significantly decreased with increased blasting time. The hardness of parboiled, nonparboiled, and American basmati grains which were flour-blasted for 30 seconds and cooked for 25 minutes decreased by 57, 24, and 20%, respectively. A further significant reduction occurred after a 40-second blasting for nonparboiled and American basmati brown rice with no further decrease at longer blasting time. This suggests that increased blasting time led to the formation of more

microperforations or microscopic holes, and, thus increased hydration rate followed by an increase in % water absorption. Guraya (2011) recommended 40- to 60-second blasting time to reduce the cooking time of brown rice and achieve the desired texture of its cooked grains.

Moreover, flour-blasting method was also effective in preserving the available nutrients in the grain since there was no change in weight before and after the blasting treatment.

### **Ways on how to prolong the shelf life of brown rice**

Oil in brown rice is susceptible to hydrolytic and oxidative deterioration, which can lead to rancid off-odors, off-flavors, and shortened shelf-life (~3 to 6 months). This susceptibility to rancidity has limited the production and consumption of not only brown rice, but also its products (Champagne et al., 1994). Figure 1 shows the lipolytic hydrolysis and oxidative deterioration of rice bran oil. During lipolytic hydrolysis, lipases, both endogenous to the bran and of microbial origin, initiate hydrolytic deterioration of rice bran oil. Within the undamaged rice grain, endogenous lipases are localized in the testa layer of the caryopsis coat, while the oil is localized in the aleurone and germ (Figure 2). Dehulling process disrupts these regions, the freed oil (substrates) makes contact with lipase enzymes and hydrolysis of triglycerides to free fatty acids (FFA) occurs.

FFA formation in brown rice is also due to lipase producing mold and bacteria present on grain surfaces. It has been reported that approximately 10% of the total bacterial population and all of the molds of rough rice are lipase-producing. The level of FFA in brown rice after 6 months of storage can typically be from 6% to 25%, depending on the extent of surface damage, moisture content of the rice, and temperature of storage. Bran high in FFA loses its value as animal feed and human food, and its oil is uneconomical to refine. The losses for potentially edible oil during refining are two to three times the FFA content in the oil.

During enzymatic oxidation, lipoxygenase enzyme found in the germ reacts with free unsaturated fatty acids to produce hydroperoxides (diperoxides, alcohols, ketones, aldehydes, semi-aldehydes, etc.), which give brown rice a rancid off-odor and off-flavor. Looking at the route of lipolytic hydrolysis and oxidative deterioration of the bran oil, brown rice can be stabilized by inactivating lipase and lipoxygenase through heat treatments, and by reducing the amount of the substrate (oil). Numerous processes for stabilizing brown rice have been developed. Since lipases are heat-sensitive, brown rice grain are usually subjected to different heat treatments to prolong its shelf-life. Dry heat and pre-cooking (wet heat) processes are effective in stabilizing brown rice kernel. These methods have been utilized in the development of quick-cooking brown rice products. Quick-cooking brown rice is stable to rapid deterioration as it underwent series of hydrothermal treatments (steaming/boiling) which deactivate lipase enzymes. Likewise,

parboiling process could also be used for producing brown rice with longer shelf-life. Parboiling process involves steeping rough rice, steaming it to gelatinize the starch, and then slowly drying the kernels. Lipases are partially or totally inactivated by parboiling during the steaming step. Parboiled brown rice had relatively longer shelf-life compared to nonparboiled brown rice.

Bergonio et al. (2011) determined the effectiveness of different heat treatments in preserving brown rice (MS8) shelf-life. They subjected the brown rice to three types of heat treatments at different exposure periods, namely, dry heat (DH, oven at 60°C: 15, 20 and 25 min), wet heat (WH, steam: 30, 60 and 90 sec), and microwave (MW, 800 watts: 30, 60 and 90 sec). All treatments were found to effectively inactivate lipases and consequently reduced free fatty acid release, even up to six months of storage. Longer exposure to heat resulted in lower free fatty acid formation during storage. Phenolic content of treated and untreated samples were not significantly different, and tended to increase upon storage. Also, antioxidant activity increased significantly up to four months of storage for wet heat and microwave treatments. Generally, microwave treatment for 60 to 90 sec was found to be the most effective in stabilizing brown rice against deterioration. Recently, researchers of the Food and Nutrition Research Institute announced that by subjecting brown rice to certain processing treatments and storing it into suitable packaging materials could extend its shelf-life up to six to eight months compared to the usual three month shelf-life of the untreated brown rice (Mabutas, 2011).

Consequently, heat treatments designed to stabilize brown rice or rice bran to lipolytic hydrolysis or lipoxygenase-initiated oxidation may increase the susceptibility of the product to nonenzymatic oxidation. Heat treatments allow redistribution of oil, destruction of endogenous antioxidants, and increased surface-area exposure to oxygen. Non-enzymatic oxidations of free fatty acids are also blamed for the deterioration of brown rice. Photocatalytic and auto-oxidation reactions, initiated by ultraviolet radiation, moisture and oxygen, and reactive oxygen species also yield products responsible for the rancid flavor and odor of brown rice. Champagne and Grimm (1995) attempted to prevent nonenzymatic oxidation by exposing brown rice grains with ethanol containing antioxidants (butylated hydroxytoluene, butylated hydroxyanisole, and tertiary butylhydroxyquinone).

Storage conditions and packaging materials also play an important role in extending brown rice storability. Storing the products in appropriate packaging materials will prevent them from being exposed to the initiators of nonenzymatic oxidation. Different brown rice storage techniques have been reported to prolong brown rice shelf-life. Low temperature storage has been effective in slowing brown rice deterioration (Mitsuda et al., 1972, Sowbhagya and Bhattacharya, 1976, and Ory et al., 1980). Flushing of carbon dioxide under vacuum (modified atmosphere method) has also been demonstrated to inhibit rapid changes in odor and flavor of brown rice. Sharp and Timme

(1986) suggested that storing brown rice in polyethylene bag at 30C storage temperature significantly extended brown rice shelf-life.

Another approach to stop lipolytic hydrolysis is to eliminate the primary substrate (free oil). Hot ethanol vapor was found effective in extending the shelf-life of brown rice (Champagne et al. 1994, 1995). The stabilizing action of ethanol is attributed to ethanolic denaturation of bran lipases with simultaneous deactivation and killing of lipase-producing bacteria and mold located on surfaces of brown rice grains.

### **Ways to reduce the phytic acid in brown rice**

Phytic acid, also known as *myo*-inositol-1,2,3,4,5,6-hexakisphosphate, or phytate as salt, is the most abundant form of phosphorus in cereal grains (Figure 3). Typically, 50 to 80% of the phosphorus in seeds is found in this compound. In rice, the phytic acid content of the seed can be up to 1.1%. Bulk of the phytic acid (~90%) is found in the aleurone layers and only about 10% in embryo.

Several health-beneficial roles of phytic acid have also been reported. Phytic acid is an effective antioxidant (Cornforth, 2002). Phytic acid has even been proposed as a cure against colon cancer (Janab and Thompson, 2002). It has also been reported that it can reduce the toxicity of some heavy metals due to its strong chelating capacity (Persson et al., 1998).

On the other hand, phytic acid is also considered as a naturally occurring antinutrient in cereal grains and legumes due to its ability to form stable complexes with divalent cations such as Fe<sup>2+</sup>, Mn<sup>2+</sup>, Mg<sup>2+</sup>, Zn<sup>2+</sup>, and Ca<sup>2+</sup> and proteins, therefore decreasing their bioavailability (Figure 4). The reduced bioavailability can contribute to mineral deficiency, a major public health issue particularly in the developing countries. Bioavailability of minerals can be improved by increasing the intake of enhancers. Individual minerals may be enhanced by different compounds (Gibson et al., 2000). For example, ascorbic acid is one of the common enhancers of iron uptake. The bioavailability of non-heme iron improves when molar ratios of ascorbic acid to iron are 0.8:1.0 and maximum at 1.6:1.0 (Glahn et al., 1999).

Another negative impact of phytic acid is on the environment. Monogastric animals cannot use the phosphorus in phytic acid efficiently because they lack the enzyme phytase needed for its digestion. Excess phosphorus from the undigested phytic acid excreted in animal wastes can lead to environmental problems such as eutrophication, a process in which the concentrations of phosphorus and nitrogen increase in nearby lakes and ponds. This causes an overgrowth of algae which covers the surface of the lake. It blocks off the light, and reduces the dissolved oxygen, resulting in the death of aquatic organisms.

To address the effect of phytic acid on human nutrition, different processing methods (soaking, steeping, germination, and fermentation) have been tested by Liang et al, 2008 to reduce the phytic acid in brown rice. They reported that fermentation treatment effectively reduced phytic acid content of brown rice by 56 to 96% followed by the soaking treatment at 100C after preheating (42 to 59%). Steeping of brown rice kernels for 24 hour at 250C had the least effect on phytic acid removal < 20%. Reduction of phytic acid increased from 4 to 60% with increased germination periods at 300C. Except soaking after pre-heating, all wet processing methods reduced the zinc level of brown rice by 1-20%.

Tabekhia and Luh (1979) reported that polishing can also reduce the phytic acid content of brown rice by almost 70%. Meanwhile, significant lose of phytic acid content (33%) was observed by Toma and Tabekhia, 1979 in cooked milled rice samples. Franz et al. (1980) showed that cooking process can decrease phytic acid content of brown rice and milled rice by 24 and 65%, respectively.

Reducing the phytic acid content of seeds is a desired goal for genetic improvement in several crops such as corn, rice, barley, wheat, and soybean because it would both increase the availability of minerals and minimize the environmental impacts of excess phosphorus. Development of low phytic acid rice is one of the sustainable solutions to improve the nutritional quality of brown rice. Bryant et al. (2005) showed a 42–45% reduction of phytic acid content of *lpa1* rice mutants, but had comparable amounts of total P, Ca, Fe, K, Mg, Mn, and Zn compared to the Kaybonnet wild type. The reduction in whole grain phytic acid P in rice *lpa1* is accompanied by a 5- to 10-fold increase in grain inorganic P, and this increase was observed in both whole grain and milled products. Other rice mutants, *lpa*-N15-186 (75%) and *lpa*-XS110-1 (65%), also demonstrated an appreciable reduction of phytic acid in their seeds (Raboy, 2009). Recently, Kuwano et al. (2009) successfully developed stable transgenic rice with much lower phytic acid content through antisense repression of the 1d-*myo*-inositol 3-phosphate synthase gene (RINO1) using the 18-kDa oleosin promoter. Seed phytic acid was reduced by 68% and the free available phosphate increased. Moreover, no negative effects on seed weight and germination were observed.

Studies have shown that fractional absorption of iron, zinc, and calcium by human volunteer test subjects increased by 30 to 50% when consuming meals prepared with *lpa* corn versus “normal phytate” corn (Mendoza, 1998 and Hambidge et al., 2004). It can be anticipated that low phytic acid rice mutants would have the same effect on minerals absorption.

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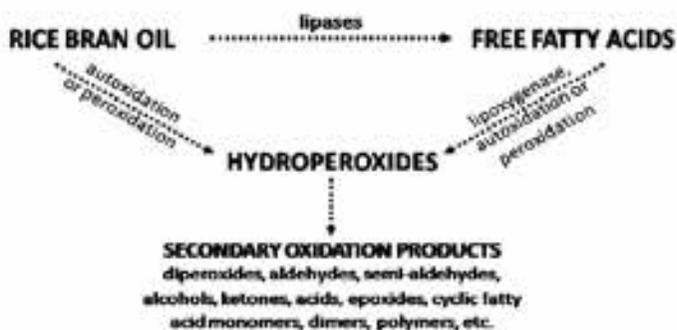
## Tables and Figures

**Table 1.** Cooking time and Instron hardness value of lightly polished brown rice.

Polishing Time (sec)	NSIC Rc160		IR64		NSIC Rc152	
	Cooking Time (min)	Instron Hardness (kg/cm <sup>2</sup> )	Cooking Time (min)	Instron Hardness (kg/cm <sup>2</sup> )	Cooking Time (min)	Instron Hardness (kg/cm <sup>2</sup> )
Unpolished	26.38 a	2.7 a	28.11 a	3.4 a	27.92 a	4.2 a
1	26.25 a	2.1 b	25.91 b	2.2 b	24.12 b	2.8 b
2	23.84 b	1.7 c	25.04 b	1.9 c	23.44 b	2.4 c
3	23.49 b	1.5 d	23.56 c	1.8 c	22.23 c	2.3 c
5	21.98 c	1.3 e	22.07 d	1.3 d	20.37 d	2.1 d
7	20.63 d	1.2 f	20.93 e	1.2 e	20.32 d	1.9 e
9	20.59 d	1.1 g	20.38 e	1.1 f	19.29 d	1.8 f
11	20.30 d	1.0 g	19.22 f	1.0 f	17.66 e	1.7 f

Mean values within the same column with different letter(s) are significantly different.

**Figure 1.** Pathway of hydrolytic and oxidative deterioration of rice bran oil



Source: Champagne et al., 1994

Figure 2. Structure of a Rice Grain

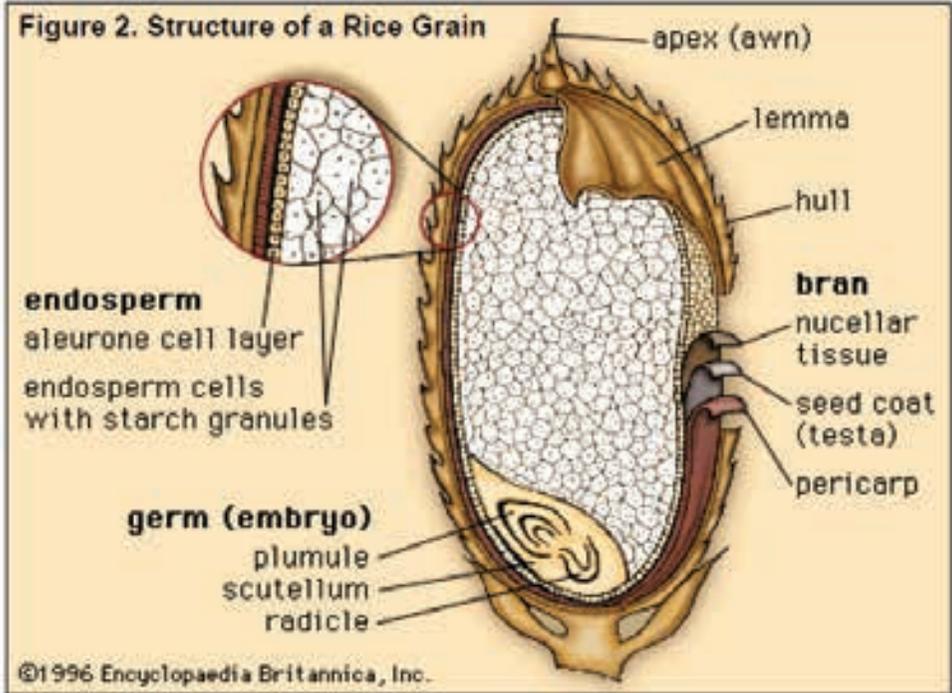
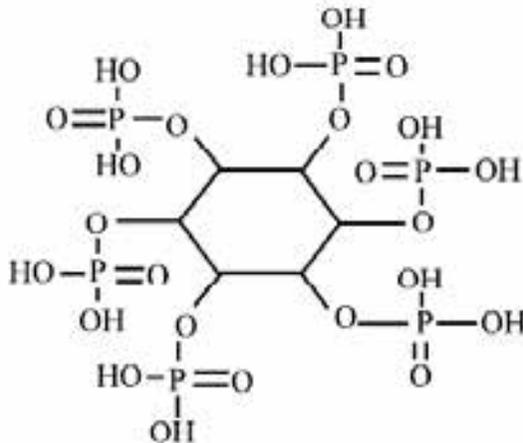
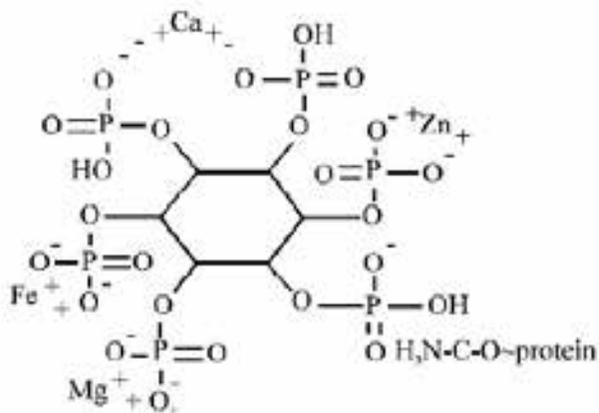


Figure 3. Structure of Phytic Acid



Source: Coulibaly et al., 2011

**Figure 4. Structure of phytic acid with the different possibilities to interact with both metal cations (minerals) and with protein residues**



Source: Coulibaly et al., 2011

**Discussion on Mr. Corpuz paper**  
*Discussant: Isidro R. Villaflor<sup>8</sup>*

**Comments**

**The Study**

I would like to express my appreciation to Mr. Henry M. Corpuz, Science Research Specialist, Rice Chemistry and Food Science Division, Philrice, Science City of Muñoz, Nueva Ecija. I would like to extend also my appreciation to the authors of various technical papers cited in the study as listed in the attached references.

I am sure the study will be appreciated also by policy makers, rice scientists and researchers and other stakeholders of brown rice

The paper presented the health benefits of brown rice and sufficiently discussed three reasons why it is not accepted by the public.

Quoting “this paper reviews the different processing methods and techniques that have been studied by researchers to address the above mentioned problems in brown rice in order to improve its quality and increase its acceptability to consumers.” It is a campaign statement to promote the consumption of brown rice and eventually to include it in the Filipino diet. Brown rice is essential for health reasons particularly for pre-schoolers, school children, and senior citizens who are poor and whose diet is composed mostly of rice.

While it is true that the paper is campaigning favorably for brown rice, it does not present doable action plan that will really make people buy brown rice.

I pray that this study will not have similar fate as those previously conducted in the name of science and technology and development and progress spending millions of pesos, but have not contributed much to the welfare of the Filipino people. I am hoping that the study and other studies on brown rice and other concerns will not get dusted inside steel cabinets in air-conditioned rooms.

**What is Needed?**

Hunger and malnutrition continue to affect millions worldwide especially in developing countries. Most affected are the young children and senior citizens who have a greater need for nutrient, but who are at the same time most helpless.

<sup>8</sup> Former Technology Expert on No Tillage Technology, DAR, City of San Fernando, Pampanga (2008-2009).

Rice is the staple food in the Philippines. Considering its various properties, rice has certain advantages as a supplementary food for children and senior citizens. Rice is rich in energy and protein. In the form of brown rice, it is likewise a rich source of vitamins and minerals. Being a rich natural source of dietary fiber, brown rice has both preventive and curative properties for cancer, diabetes, obesity, and heart and blood pressure-related ailments.

Brown rice has collateral benefits: milling recovery of brown rice is much higher than white rice by about 10-15%, it helps increase rice production and helps attain rice sufficiency. Intensified promotion, adoption, and commercialization of brown rice reduces importation of rice, thus saves outflows of dollars. Also, milling brown rice needs less energy than milling white rice. About 65% of the energy requirement in milling white rice is saved. As energy is saved, global warming is mitigated.

The national government has adopted the Philippine Plan of Action for Nutrition (PPAN) in response to the need for more responsive action to the economic development of the country.

The National Nutrition Council (NNC) and its nationwide network continue to provide the structure and mechanism for coordinating and integrating the implementation of PPAN.

The local government units (LGU's) and the private sector continue to provide assistance to raise the nutritional status of the poor.

In 2006, the regional Development Council (RDC) of Central Luzon has approved RDC Resolution No. 03-05-2006, dated March 16, 2006, advocating the consumption of brown rice and its inclusion in the Filipino diet. It recommended that the consumption of brown rice be introduced in restaurants, school and office canteens, hotels and hospitals, and included among the supplementary food items in the feeding programs for malnourished pre-school and school children.

It is claimed that the high price of brown rice is a factor of supply and demand. The demand is still small but expanding. It costs higher than NFA and commercial rice.

For the past several years, it has been observed that the price of brown rice is constant, but the demand is rising. Foreign nationals, overseas Filipino workers (OFWS), and class A, B, and C consumer groups are the regular buyers of brown rice. They buy brown rice for its health and nutrition benefits. Brown rice business is flourishing. Although the business is still limited for high-end consumers, it can expand if the price is brought down to affordable level to about P24.00 per kilo (or lesser) and be made available to the public in NFA retail stores.

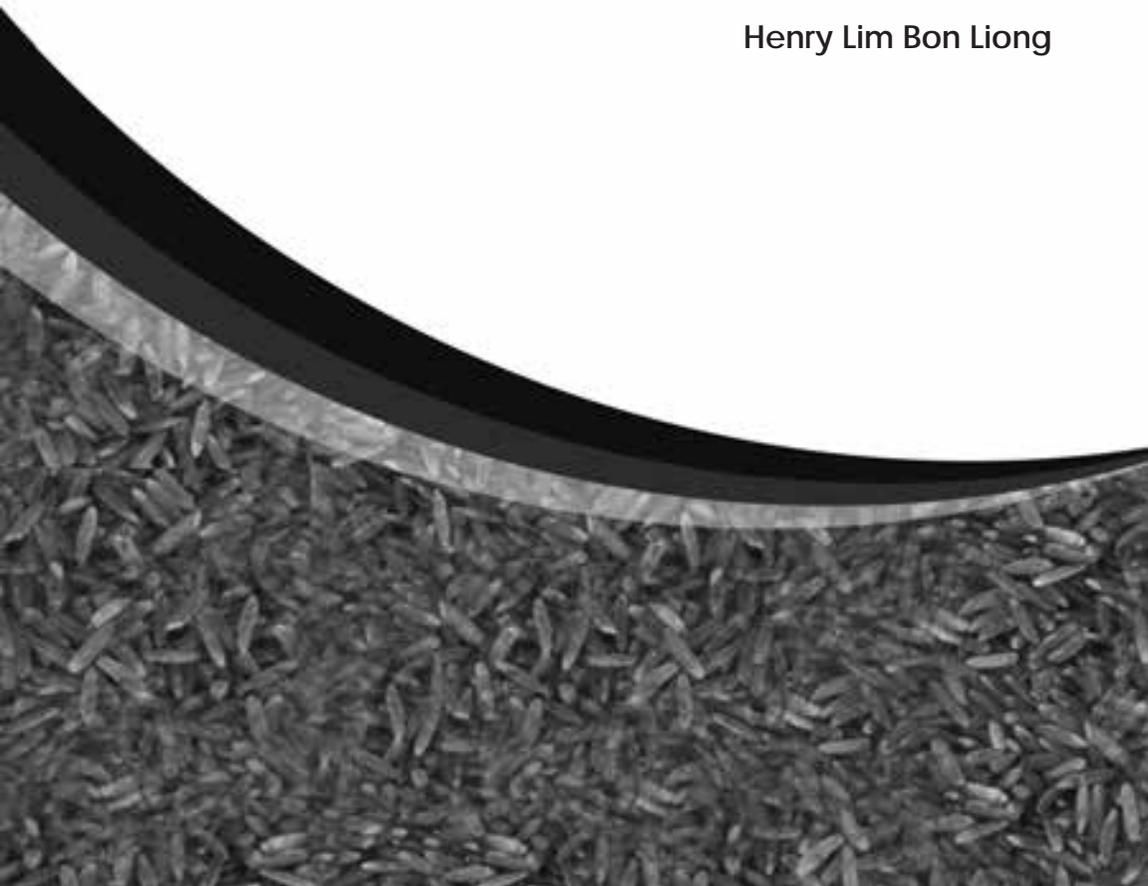
With the advent of a new administration under the leadership of Benigno S. Aquino III, it becomes imperative to develop new strategies. The people of any country are its most important resource. The health and nutrition problems, hunger and poverty should be addressed immediately to alleviate the living conditions of the poor and the needy. Each of us must be a part of the solution to prevent further degradation of our most important resource. The national government and all its instrumentalities, the private sector, and all individuals must intensify the promotion, adoption, and commercialization of brown rice.

## **Recommendations**

1. The National Food Authority (NFA) must be mandated to mill brown rice, in addition to regular and well-milled rice. NFA is in the best situation to make brown rice available to the nutrition program and the public at a very affordable price. It must be made available in its registered rice retailers. NFA can utilize its resources in buying palay, its facilities in drying, warehousing, milling, distribution system, and retailing. Brown rice mills developed by Philrice and Philmec can be used in a mill-as-needed scheme.
2. NNC and its nationwide network of nutrition committees shall conduct regular seminars/workshop to continuously assess the nutrition programs at their respective levels.
3. Nutrition month shall be celebrated by NNC, RNC, PNC, CIMNC, and BNC as Brown Rice Festival. The activities shall focus on the intensive promotion and consumption of brown rice such as display of different varieties of brown rice, selling of brown rice, acceptability contest of brown rice recipes to all age levels, slogan writing contest, singing and declamation contest, palo-sebo for children, and other activities that will make a fiesta atmosphere.
4. The LGUs enact ordinance requiring brown rice as the main food item in the supplementary feeding programs for malnourished pre-school and school children and senior citizens.
5. The LGUs encourage senior citizens to utilize their internal revenue allotment (IRA) for brown rice in their supplementary feeding program.
6. Encourage the associations and federation of senior citizens to make brown rice industry as their business.

# STRATEGIES TO INCREASE THE AVAILABILITY OF BROWN RICE IN THE MARKET

Henry Lim Bon Liong



## STRATEGIES TO INCREASE THE AVAILABILITY OF BROWN RICE IN THE MARKET

Henry Lim Bon Liong<sup>9</sup>

Rice has always been an important part of the Filipino culture. Not only was it a source of food, it stood for social stratification where rice was considered food for the elite or upper class due to the availability and the difficulty people had in producing it (Aguilar 2005). Rice gained its popularity because of its high carbohydrate content, making it as one of the primary energy foods in the food pyramid as well as it being pleasing to the palette.

Rice was introduced to our ancestors as unmilled or unpolished, also known as brown rice or *pinawa*. For hundreds of years, they consumed the grain with all the bran and nutrients intact until the introduction of rice mills by the West, which brought about polished rice. Since then, people preferred the better-tasting white rice over brown rice, which was later on labeled as a poor man's rice.

Due to the demand of polished rice by people all over the world, millers or businessmen offered it at a lower and affordable price to consumers despite the longer processing it requires compared to brown rice.

### Current Scenario

Filipinos consume an average of 120kg of rice every year and an estimated 13 million metric tons (Benaning 2011) of rice per year. With about "79 percent of 'the rich' eats rice three times a day, some 81 percent of middle-income groups eat three times a day, but 91 percent of 'the poor' [eats] rice three times a day" (Aguilar 2005, p. 22). This being said, majority of the rice bought and consumed is white or polished rice.

Brown rice was limited to Filipinos living in the rural areas that plant rice in their backyard, and it was only in 2000 that certain government institutions and foundations took the initial steps in promoting brown rice as a healthy and nutritious food. Aside from the health benefits of brown rice, these institutions also explained the economic benefit millers and businessmen will attain if they produce brown rice because it requires a shorter process.

Doctors, too, started to recommend brown rice to patients due to the release of more research materials stating the high nutritional values it contains.

During the mid 2000s, brown rice repacked into smaller pack sizes started appearing in selected supermarkets. It was also during this time that SL Agritech Corporation (SLAC) saw the potential of tapping a niche market.

<sup>9</sup> Chairman and Chief Executive Officer of SL Agritech Corporation under Sterling Paper Group of Companies, 2302 Sterling Place Bldg., Pasong Tamo Extension, Makati City.

Knowing the importance of brown rice to one's health, SLAC has made it a part of its campaign to educate consumers on its benefits. Part of its efforts is focused on on-ground sampling activities at supermarket, and joining different exhibits. Since SLAC started selling brown rice under the brand name, Doña Maria Premium Quality Rice, with two (2) variants: Jasponica Brown and Miponica Brown, there has been an increased sales contribution every year.

Currently, the retail sales of brown rice is about 25% compared to the 75% sales garnered by the white rice category (Figure 1). Though the monthly sales of brown rice is increasing monthly, retail still gives priority over the white rice variants, namely, *sinandomeng*, *dinorado*, and other imported Thai and Japanese rice because of market demands.

The major companies carrying brown rice in the rice category are: SL Agritech Corporation (Doña Maria Rice), Sunnywood (Harvester, Jordan Farm, and Farm Boy), ECT (Mrs. Lam), Upland Marketing Inc., Northern Luzon (Farmer's Choice), and LM Cereal (Vita Rice).

## Understanding the Market

Despite government advocacies and brown rice supplier's effort in encouraging the use of brown rice, there are still a lot of challenges that needs to be addressed. To better appreciate these challenges, below is a chart and grid showing the product contact points consumers have on brown rice and its product contact priority grid. This analysis is based on actual testimonials from consumers gathered from different interviews.

### *Product Contact Point Audit Analysis*

Product contact points are the experiences consumers have when they, directly or indirectly, come in contact with a product (Table 1).

The top two (2) product contact points' consumers have for brown rice are word-of-mouth from family, friends, and doctors, and in grocery stores and/or supermarkets. Referral is the number one channel in helping persuade consumers to consider brown rice to their diet. Like they say, word-of-mouth is the most powerful and inexpensive way of marketing a product because it is based on a person's first hand experience. And most of the time, consumers listen to the advice of people who are close to them, or experts when it comes to health. The next import contact point is the grocery store. The grocery is an important outlet because this is where consumers get to see, touch, and experience the product.

### *Product Contact Priority Grid*

A product contact priority grid contains four (4) quadrants that reveals what consumers think about a certain product, whether it is good or bad (Table 2).

This grid explains that there are more negative aspects of brown rice than positive for consumers to consider brown rice. One of the main reasons consumers do not want to eat brown rice is because of the taste and, secondly, the appearance, followed by other elements such as cooking time, availability, and price. The characteristics of a cooked brown rice are hard to chew, dry to swallow, and tastes like cardboard. The color of brown rice also connotes a “dirty” look, which does not appeal to people. The cooking process is also another aspect that annoys consumers because it is longer to cook compared to white rice. Others even soak it for an hour to overnight just so they can eat it. Brown rice eaters also have a limited choice of brands to choose from. They buy whatever is available in the supermarket even if the taste isn’t to their liking.

The only delighter found was that it is good for the health. Consumers also have this mindset that if it is brown, it is automatically organic.

### *Factors Affecting Availability*

After discussing the market, there are two (2) major factors affecting the availability of brown rice in the market, which we can easily say as the 2As: awareness and acceptability.

#### 1. Awareness

Health is one of the biggest topics being given importance today. Not only have people enrolled in fitness centers, joined fun runs and marathons, but they are becoming more involved in what they eat. People now prefer organic over processed food and are switching to whole grains and wheat.

Why? It is because people are now realizing that today’s modern and urban lifestyle leads to increased medical cases such as obesity, diabetes, and heart disease. And one way of battling it is to switch to a healthy diet and standard of living.

People must first be aware of the benefits that brown rice provides. Although a lot of people know that brown rice is healthy, how much do they really know? Education is the first step in letting people appreciate the product and let them realize what they can gain from it at a deeper level.

An example will be explaining to consumers how fiber in brown rice binds to cancer-causing chemicals, keeping them away from the cell lining of the colon, thus preventing colon cancer; or how the vitamin B present can help prevent beriberi; or how brown rice helps increase mothers’ milk supply for breastfeeding.

Table 3 shows a comparison of levels of vitamins and minerals in brown rice and polished rice.

Aside from the nutritional benefits, it is also important to make people understand how brown rice can help make the country self-sufficient in rice and address the issue of rice shortage. Research has shown that the milling recovery of brown rice is 10% higher than that of brown rice. And since the process does not require whitening or polishing, it can save at least 65% of energy.

After being knowledgeable about the product, the next step is to accept it.

## 2. Acceptability

The popularity of white rice increased because of its appearance, texture, taste, cooking time, and shelf-life. Brown rice, on the other hand, as discussed in the product priority grid, is the opposite, with taste being the main problem.

If people do not accept the fact that brown rice has its own distinct taste and texture, it will be very difficult to convince them to switch or even buy it. Acceptability is one of the key factors in driving up demand, which will eventually influence supply.

Because of the negative aspects mentioned by consumers, SLAC was the first to introduce one of the best tasting brown rices in the market based on the feedback of loyal customers. Customers like the nutty taste, soft texture, aroma, and versatility of the Doña Maria brown rice variants.

By addressing the need for a better-tasting brown rice, SLAC is able to convince white rice eaters to try brown rice and make them believe that eating healthy does not mean that one has to sacrifice one's taste buds.

## Strategy

After understanding the factors that hinder the demand for brown rice, which limits its availability in the market through the 2As, focus will now be on how we can increase it. The strategy will be called the 4Ps (Product, Price, Place, and Promotion).

### 1. Product

A product, no matter how good it is positioned, will always have flaws. Brown rice is more prone to weevil infestation and molding due to the high nutrition content of the bran, thus limiting it to small packaging such as 800 grams, 2 kg, 5 kg, and 10 kg vis-à-vis white rice, which is packed in 25 kg or 50 kg.

It would be very helpful if research institutions such as the FNRI, PhilRice, and IRRI should come up with a study on how to increase the

shelf-life of brown rice. Solving this predicament can help persuade millers, traders, and distributors to carry and offer the product.

## 2. Price

The price of brown rice ranges from ₱60-70 per kilo, based on a 2-kg retail pack, almost double the amount of a *Sinandomeng*. The reason why brown rice is priced higher than polished rice is because of the low demand. Even though milling it would give millers and businessmen higher savings and recovery compared to white rice, the demand cannot compensate for the cost in producing and storing it.

And for demand to take place, an understanding of the product and the market must be taken into context, as what was pointed out in the contact point and grid, which will then lead to a lower price.

## 3. Place

Filipino's buying habits have changed. Today, 34% of them, including classes D and E, purchase their groceries from supermarkets and hypermarkets, a 3% increase from 2005 (Bolido 2011). As you can see, brown rice is now available in almost all leading supermarkets, hypermarkets, and grocery stores nationwide. Table 4 lists the accounts that are currently selling brown rice.

Small chains are also starting to carry brown rice as part of their product line such as Puregold Jr., Supervalu Inc. (SVI), and Grocers, to name a few.

Sari-sari stores, wet markets, and convenient stores are yet to carry the product due to low demand and short shelf-life.

Focus should not solely be based on outlets as there are three (3) key potential areas that should be tapped in order to address the issue of availability.

The first key potential area is the **hotels, restaurants and catering (HORECA)**. HORECA is an important venue as more and more Filipinos prefer eating out rather than cook at home due to practicality and lifestyle changes.

Restaurant and fast food chains should take the initial steps in giving their customers a wide range of food choices. Today, only about 2-3% of the whole HORECA industry offers brown rice as an alternative side dish. An example is the Pancake House Group, which recently incorporated brown rice into their menu. Other high-end restaurants and five-star hotels like the Shangri-la group also offer brown rice, but are mostly overlooked in the menu because customers would rather settle for mashed potato than rice.

Another key potential area is the **fitness centers**. Gyms and fitness centers are popping in every corner of the metro like mushrooms. Not only should it provide facilities for people to work out, it should also provide people with knowledge on the different food groups. Instructors and nutritionists should be well-equipped with not only the proper ways of getting a good figure, but on how to start and maintain a healthy lifestyle.

For the last key potential area, **hospitals and clinics** should spearhead in promoting awareness on brown rice. St. Luke's and Manila Adventis are some of the hospitals offering brown rice to its patients. It is ironic that hospitals, a place where people go to seek medical advice, do not serve brown rice to their patients.

#### 4. Promotion

Lastly, what is needed to address the 2As (awareness and acceptability) is promotion. No campaign will be successful if it is not promoted properly and continuously.

For retail, aside from just displaying the product on racks and pallets, stores should have a conscious effort in promoting healthy eating among its consumers such as what Robinson's Supermarket is providing—a healthy corner; or even making in-store displays to highlight brown rice like Shopwise and Rustans.

Restaurants should put up pamphlets or tent cards on their tables and menus explaining the benefits of brown rice to one's diet. Chefs can even be creative in coming up with new and exciting recipes using brown rice to entice more people to try it and adapt to its taste.

Other medical organizations specializing in diabetes, colon cancer, obesity, and even pediatricians should promote the benefits of brown rice to their patients and fellow practitioners.

Corporations can also partner with PhilRice or the Department of Agriculture to participate in exhibits, highlighting the benefits of brown rice.

With the 4Ps strategy, we can expect that more and more Filipinos will have a change in mindset towards brown rice, and may increase its share of the pie from 25% to 40%.

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## Tables and Figures

**Table 1.** Product contact point audit analysis

Product Contact Point	Importance	Impression	Expectation	Experience
Word of mouth (Family, friends and doctors)	High	Positive	The product will help me improve my health	I cannot stand the taste of brown rice and it's a hassle to cook.
Grocery	High	Positive	Product availability	Limited brands to choose from.

**Table 2.** Product contact priority grid

Disgusters	Delighters
Bad Taste Weird Appearance	Good for the health
Annoyances	Frills
Difficulty in cooking Lack of choices Price Shelf life	Organic

**Table 3.** Nutrient contents of brown and white rice.

Constituent	Amount per 100g at 14% MC	
	Brown Rice	Polished Rice
Vit. B1 Thiamin (mg)	0.3-0.6	0.02-0.11
Vit. B2 Riboflavin (mg)	0.04-0.14	0.02-0.06
Vit. B3 Niacin (mg)	3.5-5.3	1.3-2.4
Panthenoic acid (mg)	1.4	1
Pyridoxine (mg)	0.5	0.2
Folate (ug)	19	8
Vitamin E, $\alpha$ -tocopherol (mg)	0.8-2.5	<0.01-0.30
Calcium (mg)	Oct-50	30-Oct
Phosphorus (g)	0.17-0.43	0.08-0.15
Iron (mg)	0.2-5.2	0.2-2.8
Magnesium (mg)	20-150	20-50
Potassium (mg)	60-280	70-130
Sodium (mg)	1.7-34.0	0.5-8.6
Zinc (mg)	0.6-2.8	0.6-2.3
Copper (mg)	0.1-0.6	0.2-0.3
Manganese (mg)	0.2-3.6	0.6-1.7
Selenium ( $\mu$ g)	22.5	14.7

Source: Juliano and Bechtel 1985, USDA, Gregorio et al 2000 as cited in BRADS (2009).

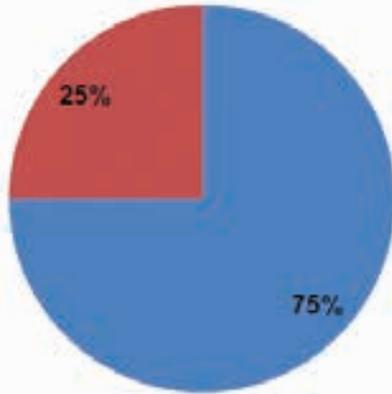
**Table 4.** Supermarkets that are currently selling brown rice.

Anson Supermarket	Pioneer Center
Cherry Foodaram	Puregold
Citimart Supermarket	Robinsons Supemarket
Company E	Royal Duty Free Shops, Inc.
CSI	Rustans Supermarket
CVC Supermarket	S&R
Eunilane Foodmart	Shoppersville
Ever	Shopwise
Grocent	SM
Hi-Top	South Supermarket
Magic	Super 8
Makati Supermarket	Tropical Hut Foodmart
Mart1	Unimart
Metro Gaisano	Waltermart

Figure 1. Rice retail sales contribution of white rice and brown rice

**Rice Retail Sales Contribution**

■ white rice ■ brown rice



**Discussion on Mr. Bon Liong's paper**  
*Discussant: Isabelita M. Pabuayon<sup>10</sup>*

## **Comments on the Paper**

I agree with the basic points raised by Mr. Liong. Being a producer and marketer of brown rice (the Jasponica Brown and Miponica Brown), he is in a very good position to talk about how to develop an effective marketing strategy for brown rice.

On the current scenario, it is good to know that the retail sales contribution of brown rice is already 25%. I suppose that this is for the retail market comprising of supermarkets, hypermarkets, and grocery stores only. If the overall rice market that includes sari-sari stores and retailers in wet and public markets is considered, the share of brown rice could be much smaller. So, 25% is really not that much considering that the volume of rice sold through super/hypermarkets is not very large. Indeed, we need to work very hard to have a bigger market share for brown rice.

Regarding what the rice consumers think, I agree with the results of interviews indicating the positive and negative points for brown rice – and these have already been raised by Dr. Roger Cuyno in his papers and discussions in various workshops. Our study confirms the same results:

Positive – “that brown rice is healthy and nutritious, it is rather expensive but the health benefits would compensate for the additional cost in the long run.”

Negative – “brown rice is expensive, my preference is for white rice, I am not interested in and have no idea about brown rice, brown rice is not readily available, and it has poor eating quality.”

The negative responses are from non-users and lapsed users (those who discontinued consumption) of brown rice. We need to seriously consider how to address these concerns (including storage/shelf-life and cooking) in formulating the development strategy for brown rice. On the other hand, in promoting brown rice, we need to capitalize on the single most important consideration among brown rice consumers – the health and nutrition benefit. This factor appeals to all, both rich and poor.

Considering the 4Ps, brown rice must, therefore, be developed and marketed as a healthy and nutritious product which tastes good and is clean (not necessarily white); it must have a competitive price, it must be readily available in places where most consumers go to purchase rice; and it must

<sup>10</sup> Professor, Department of Agricultural Economics and Director, Institute of Cooperatives and Bio-Enterprise Development (ICOPED), College of Economics and Management (CEM), University of the Philippines Los Banos (UPLB), College, Laguna 4031

involve sustained information campaign for promotion preferably by a credible person, organization, or government agency. Mr. Liong has pointed out education as a key to enhancing the awareness about brown rice and how SL Agritech has put in the market the best-tasting brown rice, thus addressing the 2As (awareness and acceptability).

On the marketing strategy, please let me point out additional aspects on the 4Ps:

### *Product*

Aside from addressing the taste, storage and attractiveness issues, R&D should help provide alternative product forms for brown rice, that is, develop snack foods and breakfast cereals using brown rice as basic raw material. Since these food products are already in the mainstream capturing both young and old and different socio-economic groups, food companies could broaden their product lines by introducing brown rice-based options. Of course, they will also raise the question of where is the brown rice that they will use as raw material, which is a question of sourcing the supply.

### *Price*

Brown rice is relatively more expensive than white rice for a number of reasons, namely; 1) the supply is limited and producers do not supply much because of limited demand, 2) it is marketed with all value-adding activities such as packaging, labeling, storage, quality control, and in some cases advertising – all involving higher costs compared to similar activities done for white rice sold in regular variety and retail stores in the community and public markets, and 3) there is perceived price premium associated with health benefits for which current users, generally the high-income, express willingness to pay.

There is opportunity to lower the price of brown rice if supply could be increased, and this could be sold with less value- and cost-adding activities and shorter chain, but still maintaining the product attributes that consumers are looking for. The case in point is coconut cooking oil. Although there are many branded cooking oil products available in the supermarkets, there remains a big market for unbranded cooking oil available in ‘gin’ bottles – it is affordable to the majority of consumers, is readily available, and has similar cooking qualities as the more expensive branded oil. The big hurdle for brown rice relates to the limited shelf-life and poor eating quality – very basic for R&D.

### *Place*

I agree with Mr. Liong regarding the potential places where brown rice could be made available to consumers. These are a) hotels, restaurants and catering; b) fitness centers, and c) hospitals and clinics. Except for the last

group, the two are generally for high- and middle-income groups. We still need to reach the majority of rice consumers, the low-income sector.

### *Promotion*

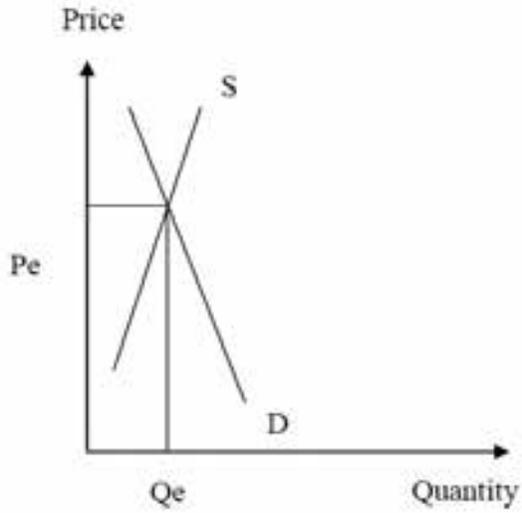
The identified promotional strategies should be explored by the producers and marketers of brown rice. The mass media provide many ways of promoting the product, but costs would be a major consideration. We need to develop innovative ways of “advertising” brown rice; otherwise, the additional cost would further raise its price, making it even less affordable to majority of rice eaters.

### **Additional Discussion**

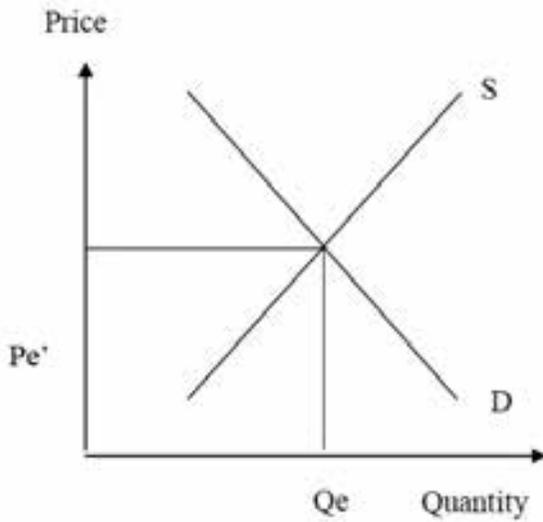
Assuming that the private sector like SL Agritech could make the necessary investments to package and market brown rice in its present form with the upper-income bracket as niche market, the question is how do we reach the middle- and low-income rice consumers?

Left on its own, the market may remain passive, and the process of market development for mainstreaming brown rice could take a long time. There is, therefore, a rationale for public sector initiatives in order to facilitate the process of brown rice integration in the mainstream market. These initiatives should include both the demand and supply aspects of the market, keeping in mind the issues that relate to both 1) availability (where the product is and how much it is offered for sale) and 2) acceptability (is there effective demand for the product considering its price and quality).

The present brown rice market is characterized as having low demand and low supply and, therefore, the price is high and there is limited quantity in the market (Panel A below). We need to develop strategies that will shift both demand and supply to the right (Panel B). A right shift means 1) higher demand, that is, at a given price, consumers are willing and able to buy more, and 2) higher supply, that is, at a given price, producers are willing to supply more; the latter also implies lower marginal cost of supplying the product in the market. The first equilibrium shows a higher price and a lower quantity; the second shows a lower price and a higher quantity, meaning a bigger market share for brown rice and more consumers availing of healthy and nutritious rice. The latter scenario is consistent with food security and nutrition objectives, even poverty reduction if small farmers become a significant part of the brown rice market.



Panel A. Small brown rice market



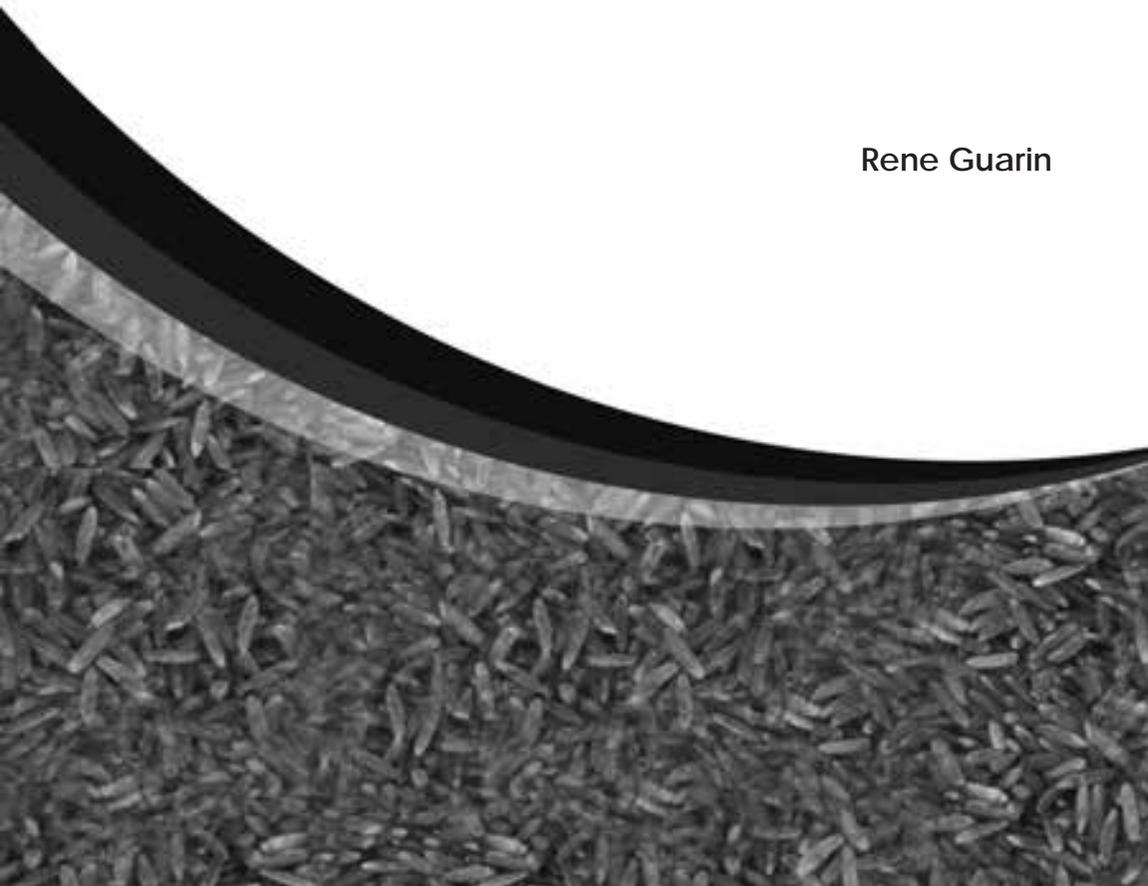
Panel B. Bigger brown rice market

The following ideas may be considered for further discussion.

- 1) Include brown rice in the various rice distribution programs of the government (DSWD, LGUs, DepEd, and NAPC) like Food-for-School Program in public schools and state-run day-care centers particularly in the poorest provinces, rice rations in disaster-stricken areas, etc.
- 2) Include brown rice in the milling, storage, and distribution operations of the NFA; NFA may produce brown rice from the palay it buys from farmers; may require NFA-licensed wholesalers and retailers to include brown rice in their trading operations.
- 3) Brown rice for the rice subsidies of government employees.
- 4) Make brown rice milling a part of the postharvest development program of the DA/ATI/PhilMEC.
- 5) Integrate brown rice education in the elementary curriculum of the DepEd
- 6) Use government media facilities to promote brown rice consumption with DOH as major endorser.
- 7) Provide subsidy (equipment, credit and/or price support) to brown rice producers; may require support price beneficiaries to mill part of their palay into brown rice for home consumption and/or sale.
- 8) Provide the support services for brown rice value addition and enterprise development for the Agrarian Reform Communities (ARCs) of DAR and programs under the National Convergence Initiative (NCI).
- 9) Use cooperatives to supply brown rice for government distribution programs; marketing contracts between specific government agencies and cooperatives may be necessary to encourage farmers and their cooperatives to produce brown rice; the cooperatives should be provided with the rice mills specifically designed for brown rice.
- 10) DA to allocate funds to formulate and implement a Brown Rice Production and Market Development Program (BRPMDP); should involve public-private sector partnership (government, farmer cooperatives, private agribusiness sector, SUC).

SOCIAL ENTERPRISE INITIATIVES OF  
CIVIL SOCIETY ORGANIZATIONS IN THE  
PRODUCTION AND MARKETING  
OF BROWN RICE

Rene Guarin



# SOCIAL ENTERPRISE INITIATIVES OF CIVIL SOCIETY ORGANIZATIONS IN THE PRODUCTION AND MARKETING OF BROWN RICE<sup>11</sup>

Rene Guarin<sup>12</sup>

## Slide 1:

### CSO Initiative Summary

- ◆ **Goals and Objectives**
  - ◆ Increase farmers income through interventions in production and marketing of rice (Organic/Brown)
- ◆ **Areas of Coverage**
  - ◆ Mindanao (Davao, CDO, Bukidnon, Zamboanga del Sur, North Cotabato)
  - ◆ Luzon (Camarines Sur, Nueva Ecija, Metro Manila)
- ◆ **Participating Organizations**
  - ◆ NGOs, People's Organizations, LGU, Provincial Government, Chamber of Commerce, Donor Organizations
- ◆ **The Program Approach – Value Chain Development**

#### Transcription for Slide 1:

Basically, the NGOs are working together and we're working mostly on organic rice. Our order in the market is to take a look at organic rice. Organic rice is synonymous to brown and red. The sales that we have seen, we can almost say 80% of what is being sold as organic rice are actually brown and red. The ratio between brown and red is 65% brown and only 25% red, and maybe 5% are compounds.

For this reason, the marketing and production of brown rice really pertains to organic rice. Our objective for doing this is that every time there's mainstreaming, the question is, what would be the benefit that would really go back to the major players? So, in our objectives for organic, we tried to look at paano ba makikinabang yung pinakamalaking bahagi ng mga nabigyan

<sup>11</sup> Contents came from PowerPoint and transcribed discussion of the author's presentation.

<sup>12</sup> Former Executive Director of Upland Marketing Foundation, Inc.

ng trabaho, yung mga magsasaka? So, sa amin, titignan namin kung paano ba makikita yung karagdagang kita sa buong usapin ng organic. Siguro, doon sa brown, hindi ko alam kung malaking bahagi ang parte ng mga magsasaka, pero mukha naman dahil ito ay bigas, pwedeng ganun din ang pagtingin, ano ba yung malaking bahagi na maibabalik sa mga magsasaka?

*Marketing and production of organic rice pertains to brown rice. Every time we implement programs, we always think of the benefits that the major players can derive from it. In crafting our objective, we look at how majority of our farmers would really gain from the program. In the case of organic rice, we considered the additional income that farmers would obtain from its production. For brown rice (I don't know if farmers have a major role in this), you can focus on what benefits the farmers could derive from it.*

## Slide 2:

### CSO Initiative Summary

- ◆ **Goals and Objectives**
  - ◆ Increase farmers income through interventions in production and marketing of rice (Organic/Brown)
- ◆ **Areas of Coverage**
  - ◆ Mindanao (Davao, CDO, Bukidnon, Zamboanga del Sur, North Cotabato)
  - ◆ Luzon (Camarines Sur, Nueva Ecija, Metro Manila)
- ◆ **Participating Organizations**
  - ◆ NGOs, People's Organizations, LGU, Provincial Government, Chamber of Commerce, Donor Organizations
- ◆ **The Program Approach – Value Chain Development**

## Transcription for Slide 2:

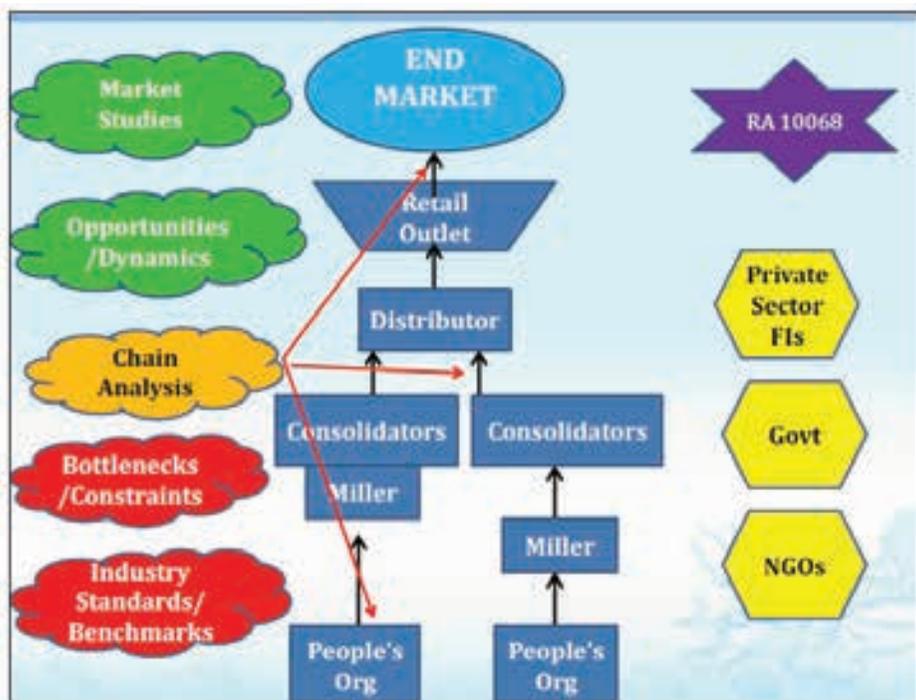
Yung programa naming, pag dating sa inisyatibo na ito, ay nasasakupan yung mga lugar sa Mindanao. Meron po kaming anim na probinsya (Davao, Cagayan de Oro, Bukidnon, Zamboanga del Sur, at North Cotabato). Sa Luzon, meron po kaming 3 lugar: Camarines Sur, Nueva Ecija, at Metro Manila. Pag sinabi po naming “lugar,” dito po nagtatrabaho yung mga NGOs, private sector groups, yung mga LGU na kapartner namin. Ang participating organization namin pagdating sa initiative na ito ay NGOs and people’s organization. Roughly, currently, we are working with around 10 organizations.

*The organic rice initiatives of our organization cover six areas in Mindanao (Davao, Cagayan de Oro, Bukidnon, Zamboanga del Sur, and North Cotabato), and three in Luzon (Camarines Sur, Nueva Ecija, and Metro Manila). These are the provinces or areas where participating organizations such as non-government organizations (NGOs), private sector groups, partner LGUs, and people’s organizations carry on the project. Currently, we are working with roughly 10 organizations.*

The approach pong ito, we call it value chain development. Yung value chain development ay para bang pagtingin. Nakikita namin pag sinabing mainstreaming ay pagpapalaki, hindi po usapin ng iilang organisasyon. At nakikita naming malaki ang kailangang pagtutulungan, hindi lang ng NGOs, pero mas malaking bahagi ang private sector, ang mga service providers, at ang government.

*The approach that we use in this initiative is called the Value Chain Development (VCD), which is a kind of assessment. When we say mainstreaming, it entails a lot of work not only of few organizations. This calls for active participation, not only of NGOs, but also of the private sector, service providers, and the government.*

### Slide 3: VCD – Components and Initiatives



#### Transcription for Slide 3:

Ano po yung nilalaman ng aming inisiyatibo? Meron po kaming matinding pag-aaral na ginagawa doon sa value chain. Ito po yung pag-trace mula doon sa pinaka umpisa – inputs, production, processing – hanggang doon sa pinaka merkado na aming pinagbebentahan. So, lahat ng mga organisasyon na may kinalaman sa production ng isang produkto patungo sa isang tukoy na merkado, ito po ay aming minamapa. Ang tinitignan po namin ay ano yung bottlenecks, mga constraints, ano mga mga problema, at ano yung mga oportunidad.

*What are the components of our initiatives? We did an analysis on value chain development. We traced all organizations that are involved from the production to the marketing of the product. Also, we identified both opportunities and bottlenecks or constraints that go along with it. These are all considered in the mapping.*

Gumawa po kami ng mga pag-aaral sa Metro Manila at sa Mindanao para makita kung ano ba yung sitwasyon ng merkado pagdating sa organic. Kaya yung mga tanong sa nakaraang presentasyon na sinasabi paano iposisyon ang brown rice? Para ba ito sa kalusugan? Yung binanggit nga nung umpisa. Is it nutraceutical or is it on food? Sa amin ganoon din ang dikta doon sa organic.

Kapag hindi namin nasagot, tanong din namin sa sarili namin. So, talagang isang malaking bahagi ito, nag-i-invest po kami ng malaki para sa market studies para malaman kung ano ba ang paningin ng consumers pagdating sa organiko. Tingin ko, pagdating sa brown rice, mukang malaking usapin ang magiging tanong. Para sa nakararami, ano ba ang kahalagahan ng brown rice? Pagkat ito ang nagdidikta, dahil naging karanasan na namin sa organiko, ng presyo, pamaraan ng pagbebenta, paraan ng pagpopromote ay nanggaling sa nilalaman ng isip ng merkado.

*We did a study covering Metro Manila and Mindanao that aims to benchmark the organic rice market. In the case of brown rice, questions such as “How do we position the product in the market? Should we promote it as a nutrition-packed rice or simply as food?” We also received similar questions for organic rice. This is the reason why we invest a lot on market studies. It will help us know the perceptions of consumers on organic rice. This information can be used as a basis for the pricing scheme, market strategies, and promotion of the product.*

Tinignan po namin ang mga benchmarks, mga panukala pagdating sa cost yield para makita kung ang pamamaraan ba na aming ginagawa pagdating sa organic rice na kadalasan ay brown, ay tugma ba sa standards ng kalaban? Pag sinabi naming kalaban, ito yung commercial. Are we at par with them in terms of use or are we better than them in terms of qualifications? And then, we also looked at accessing the links with other development organizations because as we mentioned earlier, the initiative of mainstreaming any commercial, any commodity, product really requires a lot of partnerships. So, we were looking at different modalities in terms of how we can tap government, private sector, and other players.

*We looked at the industry benchmark, the costs and yields, to determine if the strategies we have are comparable with that of our competitors. We also studied how to tap development organizations since mainstreaming a product or commodity requires a lot of partnerships with other organizations. With this, we looked at the different modalities for tie-up with the government, the private sectors, and other players in the industry.*

Overall summary of this, basically, the components try to..ano ba ang sitwasyon ng industriya kung saan yung mga nagnenegosyo na magsasaka ay mas magkakaroon ng benepisyo pag sumama po sila? Ito po yung aming nakita at napansin, yan po ay aming nahanap. Tinignan po iyan sa lahat ng mga actor na minapa po namin kung sino ba yung mga kasama para padaluyin ang produkto mula production hanggang sa market, at ito’y mga sector na aming hinahatak para makapagbigay ng tulong sa suporta, teknikal o pinansyal. At dahil organiko, pinag-aralan po namin ang Organic Rice Act of 2010 or RA 10068.

*In summary, the strategy is to identify the situation of the industry or market, and then evaluate how farmers could benefit from it. Similarly, we map the actors (or stakeholders) who can be involved in bringing the commodity from the farm to the market. These are the ones we tap, either for technical or financial support. In addition, we studied the Organic Rice Act of 2010 or RA 10068.*

## Slide 4

### Results, Analysis, Findings Two Divergent Solution

- ◆ Luzon –Mindanao –Metro Manila Organic Rice Value Chain
  - ◆ Market Intervention
    - ◆ Develop the high-end market in urban centers
    - ◆ Highlight health benefits to position rice as a high end/priced product
    - ◆ Two pronged communication plan
      - ◆ Category for certified Organic Rice
      - ◆ Two major brands in the market (one per VC)
  - ◆ Northern-Western Mindanao
    - ◆ Technology Intervention
      - ◆ Establish accessibility of IRDFS technology to farmers
      - ◆ Price affordability targeting the bigger market segments

#### Transcription for Slide 4:

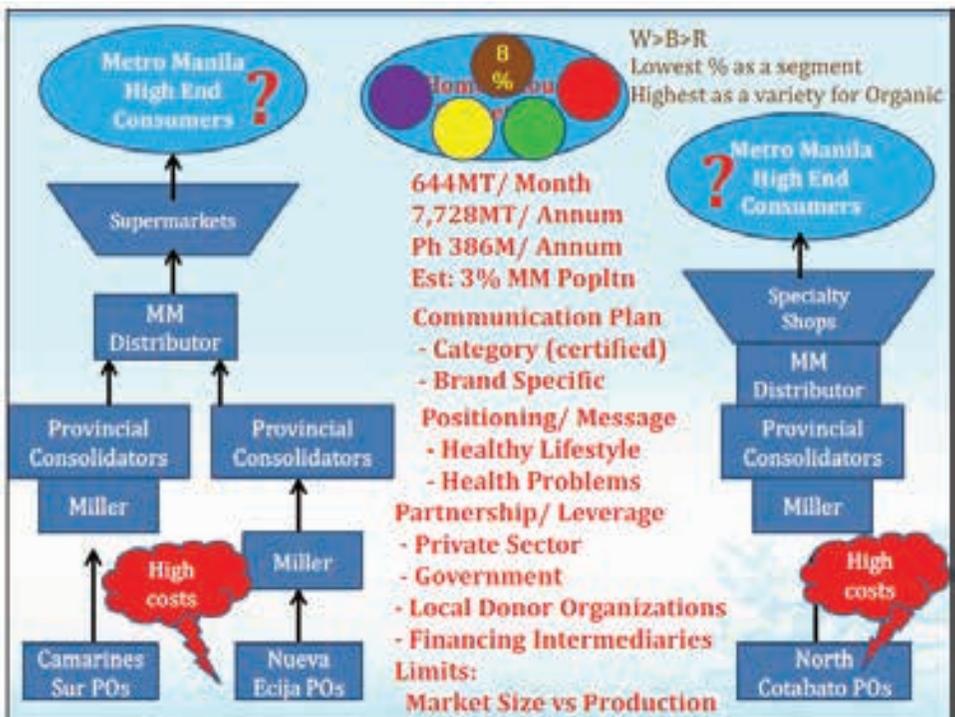
At ito po yung aming resulta ng pag-analisa. Sa organic rice po na nabanggit ko na mostly brown rice, there are two modes of intervention. For the Luzon, Mindanao, and Metro Manila markets, meaning production from Mindanao, production from Luzon targeting Metro Manila is a market intervention. Bakit po naging market intervention? Because (it's not really a re-test but) the reality of brown rice right now, in most areas, mataas ang presyo. It's not because of the inputs, but because of the labor cost, matrabaho. Kapag nagkwentahan ang mga magsasaka, masama sa kanila ang magbenta ng mura kasi alam nila mas dagdag-pagod, weeding, pagtanggap ng peste. Bagama't maraming nakitang teknolohiya, pero ang kadalasan, ito yung lumalabas. So, ang intervention, kuha tayo ng merkado na pwedeng bumili ng mataas na presyo. Ang nakita doon, paano natin malalaman na mataas ang presyo kung hindi natin alam ang merkado?

These are the results of our analysis. There are two modes of interventions for organic rice, which is mostly brown rice. For the Luzon-Mindanao-Metro Manila markets (i.e., the flow of product from Luzon and Mindanao going to the Metro Manila markets), we employ market intervention. This is because in most areas, the production of brown rice commands high price. It is not because of the material inputs, but because of the labor cost; production is laborious. Farmers cannot sell it at a lower price because it would not pay off the labor they have invested. The intervention here is that we look for a market that is willing to pay for the offered price. But how can we identify this market if we have no knowledge about the markets.

Sa Mindanao naman, it's a technology intervention kasi sa Mindanao may nakita kami sa organic na ang production nila ay mas mababa. Meron silang technology that can bring down the cost of production. So, they need not sell the rice at a very high price.

In the case of Mindanao, it's a technology intervention. In Mindanao, there are organic rice farmers that produce only a small volume. They have a technology that can bring down the cost of production. Consequently, they do not have to sell the rice at a very high price.

## Slide 5: Market Interventions



## Transcription for Slide 5:

So, pagdating po sa high-end marketing, ang una naming tinalakay, ano ba ang nilalaman ng merkado, ano ba yung iniisip. So dito lumalabas, hindi naman homogenous ang merkado. What really is the market? When we started marketing organic rice, which is mostly brown, we're thinking that it's just the middle class, that's a certain volume, and we know what they like, until we found out that there are five main segments in the market. Kumbaga sa merkado ng organic rice ng Metro Manila, may limang klase ng mamimili. At ang pinakamaliit dito ay ang segment na bumibili ng brown. Tapos, nakita namin gaano kalaki ang merkado, nakita namin na ang potential volume ng merkado para sa organic rice ay around 644 metric tons per month or 7,700 metric tons per year. Kaya sa value, it's around 386 million. It's a big volume, it's a big size for business but if you take a look at the programs for national scope/scale, maliit lang po iyon. It will take around 3,000 hectares.

*In terms of high-end marketing, the first issue that we discussed is the market. Results show that the market for organic rice is not homogenous. At first, we thought that the market for organic rice is only the middle class, until we found out that the market is really composed of five segments, the smallest of which are brown rice consumers. We also learned that the potential demand for organic rice is around 644 MT/month or 7,700 MT/year, which is valued at around 386 million. This is a big volume for business, but if you will look at the program at the national scale, it's just small. It will just take you around 3,000 hectares.*

Nakita rin namin na ang isang pinakamalaking problema ay ang communication plan. Kinausap namin yung mga mamimili, yung mga tumutulong sa pagtinda, isa lang ang tinanong sa amin eh: sa tatlong pangungusap, sa tatlong salita, sabihin mo nga kung ano ang halaga ng organic na kayang intindihin ng consumer? At wala kaming masabi. At iyon ang isang malaking challenge sa pagbebenta siguro ng brown rice. Kung gusto nating ipalaganap ito, ang tanong sa pinaka simpleng salita, ano ang halaga ng brown rice? Sa organic, hindi pa rin ito malinaw. Ang lumalabas, ang daming paliwanag pero di kayang intindihan ng consumer. Hindi pa nakakagawa ng magandang plano para ipromote ang organic.

*We also learned that the biggest problem is communication plan. Some consumers and retailers have asked us: "In three simple statements, could you explain to us the importance of organic rice; statements that can easily be understood by consumers?" We really don't know how to explain it. Maybe, this would also be the case for brown rice. If we really want to promote brown rice, we need to communicate effectively its importance to consumers. In the case of organic rice, promotion is still a problem.*

Posisyon..nakita namin for healthy lifestyle or for health problems, pero alin dito ang tututukan? Yung usapan kanina sa brown rice, may kinalaman din sa organic yun, sinasabing amylose content, at saka yung high amylose is good for glycemic index, for diabetics. That's a separate market. That's also a market for those with hypertensive. So just choosing between the two, automatically makes decision points. Ano ba yung ipo-promote? Kasi you try to go for hypertensive like, for example, organic, then we don't have to consider the glycemic index, pwede tayong kumuha ng good eating quality na yan ang pinakabasehan na lahat ng pagkain na kailangan ay masarap. Pero kung ang posisyon natin ay medisina, then, sige kunin natin ang high amylose para maganda sa diabetes at ibenta natin na medisina. So, sa aming pagtingin, importante yun kasi ang magpoproduce, ito ang magiging basehan kung ano ang variety na kanilang itanim. Kasi ang variety ang kailangang magproduce ng kalidad na hinahanap base dun sa pinakaposisyon na gustong ibenta.

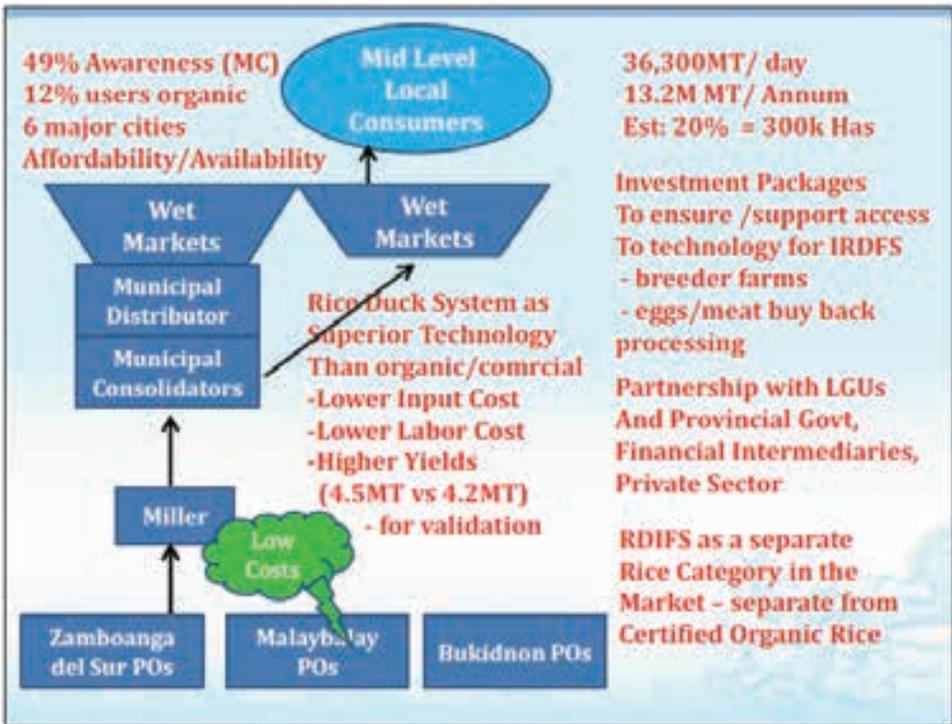
*Organic rice can either be promoted for healthy lifestyle or as an aid to health problems. However, it is better to concentrate only on one purpose. It was mentioned in previous discussions that brown rice has high amylose content, which is good for glycemic index (diabetics). It is also good for hypertension. Therefore, we have two markets, one for diabetics and the other is for hypertensive people. However, we need to concentrate only on one purpose so that producers can choose what variety to plant. This is so because certain varieties possess qualities that are suitable for the chosen purpose.*

Tapos, nakita namin na sa pagpapalaganap ng kaalaman pagdating sa organiko, hindi ito usaping mabilisan. May kinausap kami, how do we increase the awareness of consumers on organic products? I think it would be the same for brown. We were talking to a group promoting the CFL lights. Before, it was incandescent. People were telling us, "You know, it took us around five years at the least to have an impact and 10 years to see it in the market." The same thing with generics. So, sabi ko, if you want to have awareness, we're not talking about 200 programs. Be ready for a five- to ten-year program just to develop awareness. Then you must have a common message. Don't have a conflicting message. One message so that the public gets hammered by it. They get to notice, they get to understand, they get to participate, and they can abide. So, yung part kasi ng leverage, nakita namin kung gusto naming pumasok sa organic. OK, may awareness, pero maliit eh. So, sabi naming, kailangan naming paghandaan. Apart from the message, we also need partnership because it will require resources in the long-run because of the high cost organic rice production right now.

*Dissemination of information about organic rice is also not an easy task. We have sought ideas from some people on how we can increase awareness of consumers about organic products (I think, this would be the same for brown rice). We were talking to a group of people who promoted the CFL lights, they told us: "You know, it took us around five years at least to have an impact and 10 years to see it in the market."*

With this, I realized that we need to be ready for a five- to ten-year program for awareness. A simple promotional message should be developed so that the public could easily remember, understand, participate, and follow. With this, we realized that if we want to enter the organic rice business, we need to increase awareness. Part of the leverage is partnership with others who are willing to join us to finance the long-term promotion and the commodity's high cost of production.

## Slide 6: Technology Intervention



### Transcription for Slide 6:

The second track is we found a technology for organic rice, which is also mostly in brown. But this time we're targeting the local, it's no longer the high-end. In Mindanao, in one of our studies, 49% at least in Mindanao are quite aware of organic. Kung baga, it's already well known. The volume size is there. We called the rice-duck system, which is a superior technology than organic because it's lower in input cost, lower in labor cost, and it's really producing high yield. They say the national standard is 4.2 metric tons per hectare. Ang nakukuha nila doon ay hindi bumababa sa 4.5, although this will have to be validated.

*The second track is the technology we found for organic, but this time, the target are the locals instead of the high-end markets. Based in one*

*of our studies, at least 49% of the people in Mindanao are quite aware of organic. We found the technology called the Integrated Rice-duck Farming System (IRDFS) that entails lesser production costs (because of lower material and labor inputs) than organic. Yield is also better than the national average, i.e., 4.3 MT/ha. Lowest recorded yield under this system is 4.5 MT/ha. However, this has yet to be validated.*

Then, we are also looking at investment packages to ensure na yung technology would be available for the farmers dahil ngayon, hindi lang merkado ang usapan. Dahil sa tingin naming, weak yung usapan kanina: “If you make it affordable to the market, it will not really be much of a problem.” Eto kasi, this is not brown. This is what you call organic, but being affordable in price. Dahil sa survey namin, bagama’t mataas yung awareness ng 49%, ang laging sinasabi ng mga tao, masyadong mahal, pero hindi na kayang bumaba kasi ang technology na ginagamit noong mga nakaraan ay masyado naman mataas ang cost, and then nakakita kami ng technology na mababa.

*We are also looking for investment packages that can ensure access to the technology for IRDFS. Arguments such as, “making brown rice affordable to public will solve the problem” is weak. In our case, even if we have high awareness level (49%), the people complain that organic rice is expensive. This RRDFS technology will make it more affordable.*

## Slide 7: Learning and Next Steps

### Learning and Next Steps

- VCD approach
  - Allows for bottlenecks and opportunities to be highlighted to help map out sound interventions.
  - Allows for better leverage among chain players (Clear Market Intelligence, business models are effective leverage as financial resources).
  - Allows for clarity of roles and functions among the many stakeholders, which lead to better partnerships.
  - High commercial consumption requires a fit between price and the product offer.
- What is the VCA for Brown Rice?
- What is the price-product offer fit for Brown Rice?

## Transcription for Slide 7:

Ano po yung learning namin dito. Yung sa value chain na approach, nakikita namin ang kahinaan at oportunidad bilang parte ng isang kabuuan. Kung бага, we are working with a set of players not just in isolation. Kasi kadalasan, when you talk about social enterprises, civil society organization, ang picture eh NGO gumagawa ng sariling negosyo na kalaban ang buong mundo. So, dito, ang naging practice ngayon, hindi. Kasama tayo sa isang malaking negosyo, supplier tayo nito. Kailangan nating kausapin ang mga pinagdadalhan ng produkto ninyo. Kung saan dadalhin ang produkto ninyo hanggang sa merkado ay kailangang magkausap tayo kasi may kinalaman dito ang kalidad, ang presyo, ang produkto.

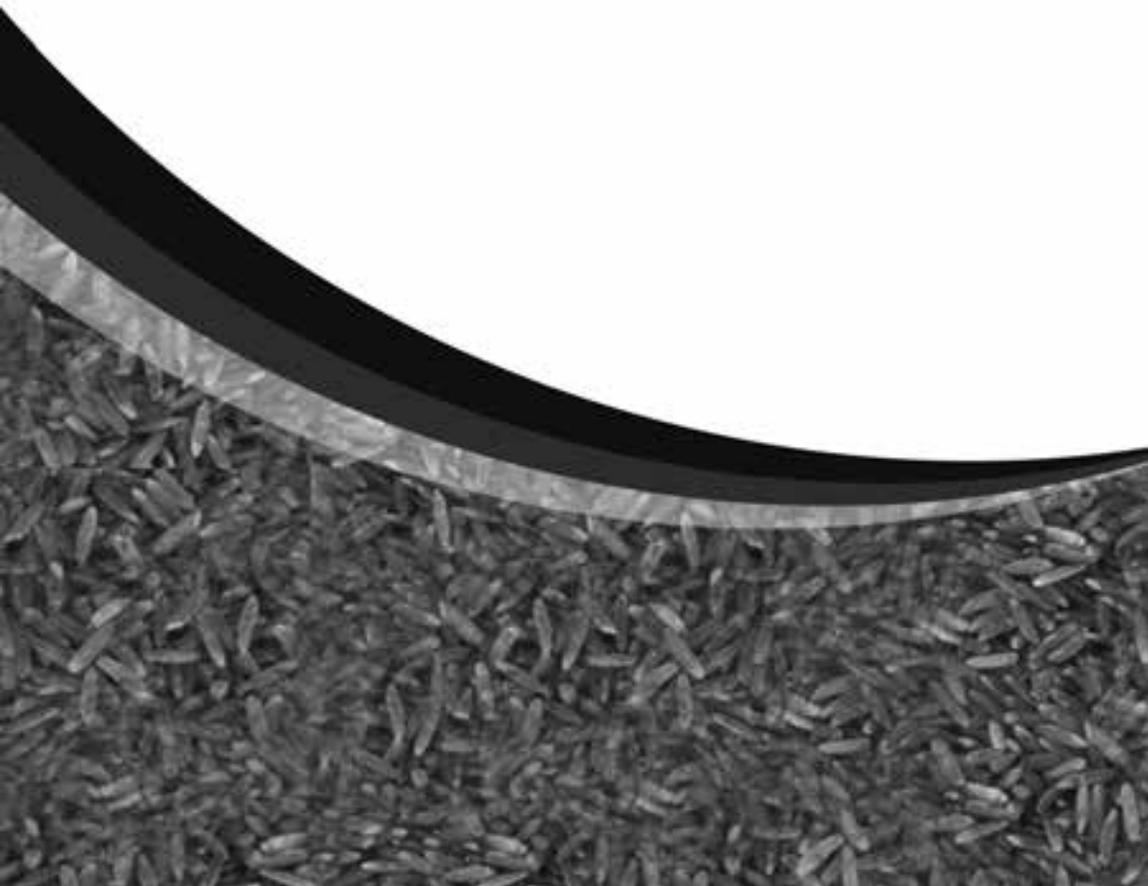
*In the value chain approach, we look at both opportunities and bottlenecks in the business. We also considered working with other players in the market. The common notion about social enterprises is that it is about NGOs making its own business. But now, we try to tie-up with other chain players. To effectively do this, we need to know and understand the players involved from production to the marketing of the produce. We need to talk to them because this business also involves the quality and price of the produce.*

So, nakikita namin ang knowledge na sa ganitong approaches ay isang magandang paraan to mainstream organic or brown rice. It allows for better leverage because aside from funds, which is normally the main leverage located here, market understanding and intelligence send forth a definite goal of groups who go into this together. This allows clarity of roles. Malinaw kung sino bang gagawa. Finally, high commercial consumption requires a fit between price and the product offer. So, with organic, I think they've already identified how to sell the product between levels of the market, the high and low levels, because they know how to position the product. I think for the brown rice, the question is, is there a VCA needed for brown rice? Second, what is the price-product offer fit for brown rice?

*We think that the value chain approach is an effective tool in mainstreaming organic or brown rice. It allows for better leverage because it involves partnership or pooling of resources of chain players. It also calls for market understanding that can be used to set a definite goal for the players. It also allows for clarity of roles of the stakeholders. Finally, high commercial consumption requires a fit between price and the product offer. So in the case of organic, I think they have already identified how to sell the product to the market because they know how to position it. However, for brown rice, the questions are: Is there a VCA needed? What is the price-product offer fit for brown rice?*



# OPEN FORUM



## OPEN FORUM

### OPEN FORUM ON TOPICS 1 and 2:

Topic 1: Nutritional benefits of brown rice

Topic 2: Implications of brown rice to self-sufficiency

**Riza Ramos (PhilRice):** Most of the studies presented or the data shown were on normal adults. How are we going to address the anti-nutritional factors of brown rice if we are going to introduce it to low- and middle-income families, especially to children who are already with health issues like parasites, very low-iron blood? With those factors, how are we going to strategize our introduction of brown rice to them? First, we need to satisfy their calorie and iron requirements before we introduce other nutrients. It is really good that brown rice can contribute so many nutrients, but for low-income families with this condition, how are we going to strategize our efforts?

**Marissa Romero (PhilRice):** The first thing that we have to consider is the protein-energy requirement. Kailangan may source ng energy, carbohydrates, and then protein. The reason why I showed the data from FNRI ay para makita natin ang different age groups. It's really true na kapag mga bata, limited ang diet, limited ang sources ng essential vitamins and minerals. That's why nandito tayo sa workshop na to para pag-usapan ang strategies. But the other paper will discuss ways to improve the problems on brown rice.

**Trinidad Trinidad (DOST-FNRI):** Yung question tungkol sa minerals, I think napresent na ni Dr. Romero na there is no significant differences between iron absorption from the milled and brown rice. So, I don't think we have a problem with the phytic acid that is present in brown rice. Although we have not identified the type of phytic acid that is present in brown rice, we have to look whether it has very high IP6, IP5, IP4 and IP2. Kailangan natin maidentify kung ilan ang phosphorus na present sa brown rice because it is very important. Kung puro IP6 and mataas talaga, then we can't say that it can't interfere especially with zinc, not with iron. I think zinc is more sensitive sa presence ng phytic acid, hindi ang iron. I think we need to have some future work on that aspect pero in terms of iron, I don't see any problem. Nakita din natin ang carbohydrate content nya. Actually, the carbohydrate that is present in brown rice are mostly complex carbohydrates, which are very good sa katawan ng bata. Of course, children are also required to have to some amounts of dietary fiber for laxation, yung regularity nila and also for strengthening their immune system.

**Riza Ramos (PhilRice):** We're talking not of normal kids here, that's my concern. We know that low-income children are way below their caloric requirement. When we have that condition, is it really safe to feed them with just brown rice, or is it safe once a week?

**Trinidad Trinidad (DOST-FNRI):** Actually, ang nutrition law is eat a variety of foods in moderation. Hindi lang naman yun ang ipapakain mo. It is one

part of the meal. And I think brown rice is better than milled rice kung ito ay kakainin talaga ng bata because of their needs/requirements for growth and development.

**Rene Guarin (Upland Marketing Foundation):** In my discussion with different groups, they are concerned about brown rice when it is commercially produced because of the pesticide residue. They're saying that some of the doctors they've talked to mentioned that brown rice, they claim, to be more dangerous when it's commercially produced because the pesticides are still on the bran, unlike when you polish it, it's now removed. How true is this? Are there studies that really look at the pesticide residue, and what are the implications because it really counteracts the health benefits that brown rice is supposed to provide consumers?

**Jaime Tadeo (National Rice Farmers Council of the Philippines):** The brown rice I produce is with zero chemicals, zero pesticides. Kaya ang brown rice ko, organic na, zero chemicals, zero pesticides, masustansya na, masarap pa. Ang ginagamit ko 160 (NSIC Rc160), kasi ang 160 ang pinakamasarap na variety sa PhilRice ngayon. Sabi ni Dr. Ruiz, ang toxic substance sa bigas ay meron lamang 0.083. Ang pinapahintulutan ng World Health Organization Sanitary Phytosanitary ay 0.015 hanggang 0.02. Pero dahil sa chemical agriculture naging 0.083, tumaas sya. Pero nung nag-organic kami, ang aming brown rice ay walang lason.

**Marissa Romero (PhilRice):** There is an on-going study evaluating ang effect ng merong pesticide at wala. Si Dr. Mamaril, baka gusto ng magsalita on that issue briefly.

**Cesar Mamaril (PhilRice):** We, together with Dr. Juliano, are presently studying the effect of pesticide against no pesticide at all. But we still do not have firm results. We have analyzed some antioxidants, and there is no difference at all between the pesticide-treated and the inorganic-treated. Antioxidants are being produced naturally by plants when they don't receive any pesticides. This is for their protection against pests and diseases. However, even if you use inorganic fertilizer but no pesticides, you still have higher antioxidants, similar to those that have not received any pesticide at all even if they are organic. So far, we are trying to verify whether this is true for rice.

## OPEN FORUM ON TOPICS 3 and 4:

Topic 3: Ways to improve acceptability of brown rice to consumers

Topic 4: Strategies to increase the availability of brown rice in the market

**Engr. Isidro Villaflor:** Nais ko lang pong banggitin ‘yong binanggit ni Mr. Liong na ang halaga ng kanilang brown rice ay ₱60 to ₱70 per kilo based on the 2kg pack. Sa madaling sabi, ang isang mahirap na pamilya ay kailangang maghanda ng ₱120 or ₱140 para makabili ng brown rice. Iba po kasi ‘yong target market na kanyang binanggit kaysa doon sa target market na binabanggit ko. Alam po ninyo, maraming mahihirap na hinahalungkat ang basurahan para makakita lang ng pagkain. Kung ang halaga ng brown rice ay ₱120, iyon po ay ibang target market, iyon po ay sa mga mayayaman, sa may pera. Ang issue po ngayon dito ay kung papano ang mahihirap na pamilya, ang mga marginalized families, ay magkakaroon ng accessibility sa brown rice. Ang isa pong dapat nating tingnan ay ‘yong affordability. Ang isang mahirap ay nakakabili ng ₱20 na regular milled. Kung ito po ay bibigyan natin ng pagkakataong makabili ng ₱20 na brown rice, iyan po ang accessibility at affordability ng brown rice.

*Responses:*

**Mr. Henry Lim (SL Agritech):** Ang sinasabi ko kaninang ₱60, ito ay para sa dalawang kilo. Not necessarily ka-presyo ng brown rice. Di ba kasi pag-entrepreneur ka, you look for the market for that one? Ang sinasabi ko pag marami ang demand ng brown rice, marami din ang supply. Pag marami ang supply, syempre bababa ang presyo ng brown rice. Ang NFA, kung magmi-mill sila ng bigas instead white rice, magmi-mill sila ng brown rice. Siguro they can sell it at ₱27 or ₱20, but tingin ko wala na ‘yon. I think, nasa ₱27 or ₱28, medyo pwede pa rin ‘yon. We are just making an alternative ng mga mayayaman. Kasi ang may awareness ng brown rice ay mga mayayaman, gusto nila healthy sila. I tell you, ‘yong may alam ng mga brown rice natin ay ‘yong mga artista tulad nina KC Concepcion, Kris Aquino, Marian Rivera, at Dingdong Dantes. Yong mga kaya, sina Manny Pacquiao; kumakain din ng bigas natin. Sabi nga ni Manny Pacquiao, kaya malakas sya hindi dahil sa Alaxan, kung hindi dahil sa brown rice.

We are not saying that brown rice will not be accessible to the poor. it’s just that the demand goes up when supply increases. And when the supply increases because of competition, prices will naturally go down. I want to see that our public market na may takal-takal na brown rice diyan. Kasi pag binentahan mo ‘yong public market ng brown rice, hindi nila tatanggapin ‘yon. Syempre, walang demand ‘yon, baka masira lang yan. So, sinasabi natin, kung may pondo ng gobyerno, be the one to create an awareness. Kaya medyo mahal ang ating brown rice, we are doing the awareness ourselves. Meron kaming mga promo, mga pinapakain, etc. So, ang problema ko ngayon, can the price be dropped drastically?

### Questions/Comments:

**Ms. Teresita Silo (Nutritionist):** 1. May tanong lang ako, wala po yata tayong miller or rice trader that could help very well in the policy workshop later sa group discussion. Kasi kailangan ko din sila. So 'yon po 'yong mamaya, binibigay lang po namin ang pwede ninyong pag-isipan pagdating sa discussion. 2. Lagi pong sinasabi 'yong aspect ng brown rice na panget, madumi, ayaw. Now, sa mga mahihirap po, alam po natin mga farmers, 'yon pong pinakamaganda binebenta, at 'yon naman pong mga itim kinakain po noong farmers, so wala po 'yon sa itsura. Now, 3. 'Yon pong rice na 'yun, maitim na dahil matagal ng nakababad sa tubig. Kung 'yon po ay inihalo sa brown rice, kakainin pa rin 'yon. Sa mga mahihirap na pamilya, hindi po importante kung ano itsura ng aming kinakain. The thing, is may kakainin kami. Hindi po, hindi na nga po ulam ang pinag-uusapan eh, may makakain ba kami? Ito'y kung mahihirap ang pinag-uusapan natin. So siguro pagdating sa psychological aspect ng brown rice, baka pwedeng pag-aralan 'yon. Ano bang effect noon kung may mga taong makakita kung maitim ang aming bigas na niluluto? Masarap siguro 'yon kaysa doon sa may mga gumagapang na uod.

Ang comment po namin doon sa preparation ng rice at the household level. What I was expecting are: Ang pagluluto ng brown rice ay ginagamitan ba natin ng gas? Ng charcoal (uling)? Kasi, kung ating dadalhin ito sa middle- and low-income, kasi masyadong typical po masyado, or 'yong ating rice cooker ay gumagamit ng electricity? So, kung meron din tayong mae-rerepresent na ganoon para kung maibaba po natin ito sa low- and middle-income families alam nila kung anong gagawin. Dahil sa ngayon ang isa pa naming gusting i-correct, kasi sa Laguna po ay marami na ring brown rice na inumpisahan ni Dr. Mamaril. Pero marami na rin po, bukod sa SL Agritech, totoo din po na sa palengke, meron kaming binibilhan ng brown rice na katulad ang halaga ng polished rice, and we are using IR-64. At marami na pong naghahanap ng brown rice. So, there's a good sign that the demand has already been created, which also brings us to the fact that pag-sinabi nating brown rice ang kinakain mo, "rich" ka. Wala na po ngayong sinasabi na pag brown rice, "poor" ka. So ngayon, sa feeding program, we very much open-handedly accept feeding programs, brown rice ang pinapakain sa mga bata, pregnant, at lactating women. So, talagang, ayaw na po naming at gusto naming burahin sa kaisipan ng lahat, na pag sinabing mahirap ka, pagkumakain ka ng brown rice. No! You are rich when you eat brown rice.

And another thing, 'yong sa storage po, pagdating po sa low- and middle-income families, hindi naman po tayo nag-iistore ng brown rice na umaabot ng dalawang buwan. Doon sa low-income, meron siguro tayo everyday para isasaing. Sa middle income siguro mga 1 week, the most is 1 month.

**Ms. Renita dela Cruz (PhilMech):** Tama po. Ito ay tungkol sa brown rice as mentioned earlier. Sa perspective po kasi ng farmers who are in the low-income group, 3-6 months. Wala po sa kanila 'yon because the availability of rice minsan 1-2 buwan to get, mahaba pa. So, ang problema po sa ngayon

is wala po tayong facilities kahit na gusto nila. Tama po 'yong sinabi ninyo na yong maganda pinagbibili ng farmer, at ang panget sa kanya. Mas marami po na ganoon kasi nasa area po tayo ng Camarines Norte, 'yong Eastern Seedwork na very prevalent po ang ulan. Ngayon po sa perspective na 'yon, ang nakikita naming dito ay kakulangan ng facilities na kung saan sila pwedeng magpa-mill na ang resulta ay brown rice. Kasi ang available po ngayon na pumunta sa bukid, ay 'yong mga roving. Ito ay mga single-pass na pag-lumabas, milled rice na rin. So, alam din nila na mas mababa ang milling recovery. Kaya kung meron po tayong available sa community na huller, siguro po mapapabilis natin ang pag-mainstream ng brown rice sa mga poor families. Pangalawa po, sa processor miller, syempre sila po ay milled rice na. Talaga po na pagandahan sila sa facilities nila na brilyo ng milled rice. 'Yong available nating mga processor, millers na ngayon. At hindi po tayo makakapunta doon kung ako ay maliit lamang na magsasaka na merong less than 100 bags para magpa-mill. Hindi po ako i-entertain. Dahil 'yong isa ay medyo malaki-laki ng processor miller, ang i-entertain po nila ay 'yong mga farmers na merong at least 100 bags para makapag pa-mill. My point is, importante po na may readily-available huller tayo sa community na pwedeng magamit. We can probably include ito sa sinasabi ni Dr. Pabuayon sa Rice Mechanization Program ngayon ng gobyerno.

**Dr. Eulito Bautista (PhilRice):** Ako nga po ay mag-rereact na bilang farmer, miller, at consumer ng brown rice. Actually, I would like to commend, natutuwa nga ako andito 'yong SL Agritech, kasi sa totoo lang, when SL Agritech penetrated the brown rice market, na-introduce ang brown rice. It is now becoming common in the supermarket. Because very consistent ang kanilang quality packaging. Sabihin na natin na mahal, but they made a breakthrough in terms of introducing great awareness and demand. Sabihin na natin na high-end ang kanilang mga customers, but that's actually a breakthrough. Kasi karamihan ng efforts ng maliliit kagaya namin, hindi ganoon ka-consistent ang aming efforts, quality, and volume. At the same time, karamihan ng mga producers ng brown rice, more on rice na nagmula sa atin, meron pa ngang red rice, na pag niluto mo, napakatigas; kaya 'yong acceptability affected.

The main reason daw kaya mahal ang brown rice from our side (Ka Jimmy, etc.) is number 1, we don't produce ordinary brown rice or normally used varieties or both with high-eating quality. Tingnan nyo 'yong price ng puting bigas na masarap sa market, from ₱35-₱40, white rice pa 'yon. Essentially, the varieties that are suited for brown rice are those with good-eating quality like yong Jasponica and any other glutinous variety. Second, sa processing po, tama 'yong sinabi ni Ms. Dela Cruz ng PhilMech na 'yong rice millers natin hindi tumatanggap ng small marketing naimi-mill. Kaya napipilitan kami na mag renovate our own rice mill, just to simplify or minimize the cost kahit na 'yong brown rice mill na ginagawa namin. Ako, ginagawa ko sa shop, innovating or improving because hindi perfect ang aming mga equipment. Sa totoo lang, kung gagamitin nyo 'yong ordinary rice mill, normally 50% lang ang dehulled, 'yong 50% ay palay. Pipiliin mo pa 'yon. isipin mo 50% manu-mano

mong pipiliin 'yon. So, how much labor do we spend simply by providing a good quality or a practically pure brown rice? Kahit noong sinabi ni Ka Jimmy na rice mill, talagang napilitan akong mag-provide sa kanya ng rice mill kasi nakikita ko na very interested sya noon. Kahit 'yong rice mill na ginagawa niya, although mataas 'yong milling recovery, mabagal pa din. Compared to other rice mills, binabalik-balik pa rin nya 'yong rice para lang maminimize 'yong palay. Kasi mahirap talagang mahiwalay, manu-mano 'yon. Isa pa, just to attract good quality brown rice in the market, nagpapataas pa ng presyo ito, 'yong brokens. Alam nyo po 'yong brokens kailangan ihiwalay, and that increases the prices of the final product. Isa pa, karamihan po ng mga varieties na available ngayon na magandang gawing brown rice ay very low-yielding. 'Yon nga pong kay Dr. Mamaril, maka-3 tons na siya tuwang-tuwa na siya. So, kung ikukumpara mo sa modern varieties na high-yielding kahit hybrid pa yan, 8-10 tons. But 'yong sa kanya, 3 tons lang di pa compensated. So, you need to balance the price of the final product, di pa kasama dito 'yong advertising. So, I'm sure if there's a great demand at marami mapoproduce, there will be competition, and I'm sure the price will go down. But at least when we are just starting to penetrate the market or introduce brown rice, talagang mataas ang price.

## OPEN FORUM ON TOPIC 5:

Social Enterprise Initiatives of Civil Society Organizations in the Production and Marketing of Brown Rice.

**Isidro S. Villaflor:** You made mention of the technologies na magpapababa sa gastos ng production ng organic rice. Meron po akong isa-suggest para bumaba ang cost of production and, therefore, maging competitive ang presyo ng organic rice. Ito po ay na-develop namin dito sa Nueva Ecija na mga previous technology in rice production. Ito po ay unti-unti kong dinebelop dahil nga sa pagka-PhilRice. Paki tignan nyo nga po ang status nito kung pwede na nating ilipat sa mga magsasaka? Sa pangunguna ni Dr. Manny Regalado, pakitaas nga po ang kamay, natapos na po yung aming pag-aaral dito for verification test of no tillage technology in irrigated rice production. At yoon po ay sinustenehan ng 5 years na ang no tillage technology is more productive than the conventional tillage. More productive, less costly, and at the same time energy-efficient. Ang pwede po nating idagdag ay it mitigates climate change. So, kung ang problema po nyo ay technology doon sa previous speaker para mapababa ang cost of production, iminumungkahi po namin na tignan nyo, itong no tillage technology in rice production.

**Manuel Jose C. Regalado:** Yung no tillage po ay isang component pa lang pero amenable itong brown rice includes processing. Although makakababa ng konti, pero yung sa cross-breeding pinagtutuunan na po ng pansin kasi matas pa rin ang cost. Yung packaging lang ay makikita nyong vacuum packed. Mahal yung vacuum pack. So, baka may iba pang means. Of course, yung mga technology na nasa production mismo hanggang sa postproduction, lahat ng makakameras tayo ay dapat pagtuunan ng research and development.

**Eduardo Jarcia:** Hello! Good afternoon! Magandang hapon sa ating lahat. Ako po si Ed Jarcia from NFA. May ipapakita akong ready-to-build, baka familiar going to Aris Beltran. Pero anyway, you get that, these comments and suggestions positively. Dapat kailangang talagang pag-aralan itong mga concerns na kinakaharap natin especially with respect to the marketing of brown rice. At base sa napag-usapan kanina hindi po totoo na hindi kami sumusuporta sa brown rice advocacy. In fact, produkto po ito ng institutional limitation on our part na dapat ma-address. In government you are taling about that. Kasama ko kanina yung director of marketing, ang ahensya lang, storage for food security purposes. Isa nga po sa mga constraints ng brown rice is yung storability nya. But then, if we have the technology na justifiably na maano yun, OK lang. Probably yung ating tangible from consumers come with bright policies. So, gusto ko lang po sanang banggitin yung mga binanggit kaninang mga inputs. Changing our attitudes towards white rice. If we teach ourselves to consume brown rice little by little time, will come na mag-i-increase yung brown rice consumption. So yun lang po. I think yung last presenter, if I may comment, napakaganda pong template yun na kung saan pwede natin masundan on how to go about pushing our advocacy on brown rice. Yung sinasabi nyang value chain analysis. Identify the right message and

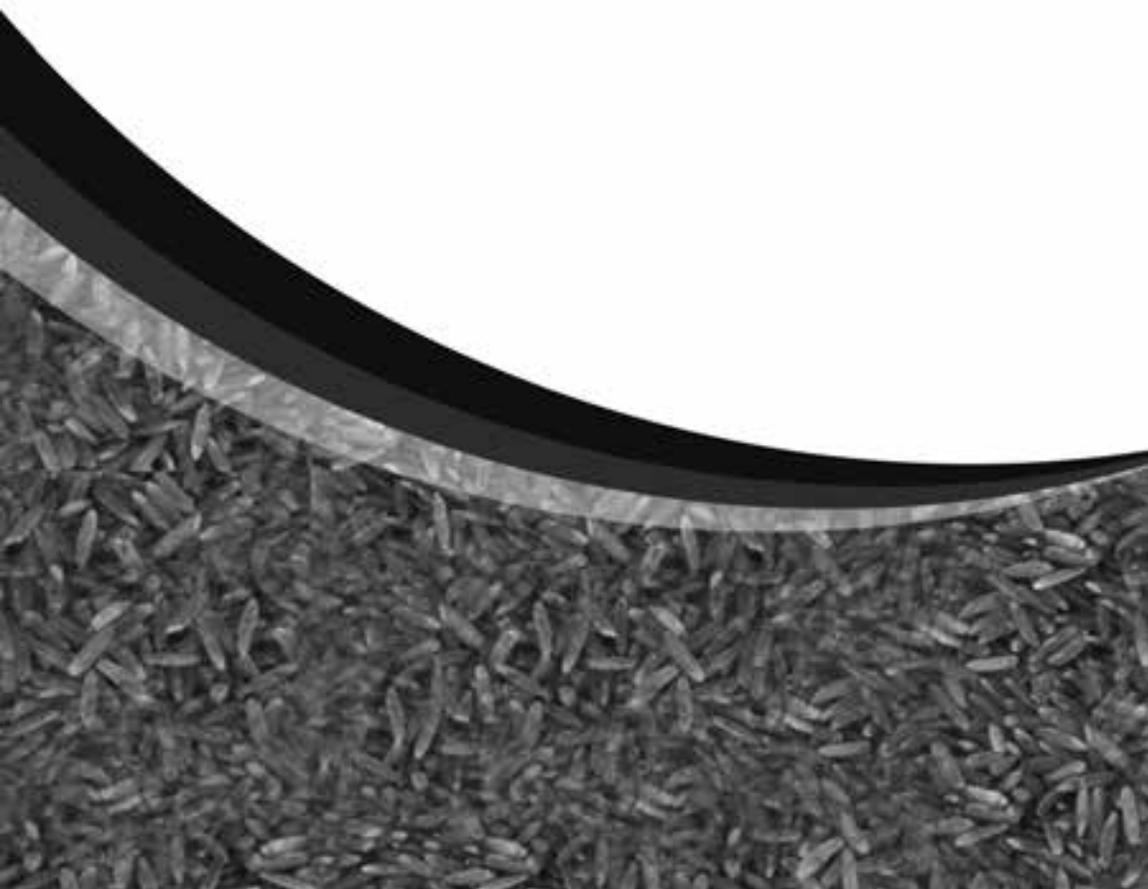
other components. I think that would help us push through our endeavor in this congress. Marami pong salamat.

**Carmen M. Paule:** Good afternoon! I'm Karen Paule representing Asia Rice Foundation. The three debutant papers presented this morning raised the negative effects of phytic acid in comparing brown rice from iron absorption. Right? I think this has been addressed by our scientist from the Food and Nutrition Institute, si Dr. Trinidad Trinidad, na there is no significant (statistically) difference between white rice and brown rice especially when it is consumed in balanced diet (fruits, vegetable, etc.). Kaya nga lang siguro, mahirap sabihin sa mga poor families. Kakainin mo yung brown rice together with isda't kamote or 1 glass of juice kung ayaw ng native citrus natin. When you eat brown rice in a balanced diet wala namang effect yung phytic acid sa absorption ng iron. And another one, yung sinasabi na yung mga high quality rice that are ideal for white rice consumption, yung malambot yung mga ganun, these are the same varieties ideal for brown rice consumption. Kasi kung ang gagamitin nating varieties for brown rice production ay di masasarap, di mas mahirap ipa-accept sa ating mga consumers? So, another thing is yung marketing brown rice, ano ba talaga ang ating gustong i-emphasize? Kasi di ba? Kahit yung mayayaman. Si former president Cory Aquino died of colon cancer. Now is the time na nainip na ang asawa ng then Secretary Arthur Yap. Kumain po ako ng brown rice. So, as health is wealth, emphasize natin yung nutritional and health benefits of brown rice rather than emphasizing longer cooking time, yung coarse texture. You could develop rice recipes. So, I think there is a need to promote brown rice through intensified brown rice education and information campaign to erase negative or false perceptions. If we really have to promote brown rice, siguro nga yung health and nutrition benefits. There is a need to develop rice recipes varieties para sa airlines, hotels, a nd majhihirap na pamilya.

**Artemio B. Vasallo:** Good afternoon po. Taga Bicol po kaya ako magtatagalog. Eh, napansin ko kasi na nagsalita na lahat ng katabi ko kaya magsasalita na rin ako. Inaantok na yata kayo? Pero yung ano ko lang, parang hindi kasi nabanggit na sa process kasi ng paggawa ng brown rice, importante magsimula tayo doon sa, tama yung sabi nila, magbigay na ng variety pero napaka importante nung sizes na gagamitin natin pare-pareho. Kasi sa ngayon, yun bang tinatawag nating rample na iba-iba yung size, kaya kung minsan namamahal yung proseso gawa ng hindi nababalatan lahat. Sabi nga ni Dr. Bautista kanina, kung minsan pinipilian pa nya kasi may natitirang talagang hindi nababalatan kasi, most of the time, hindi pare-pareho ang sizes. Sa malalaking processing center, may grader. Palay pa lang ay gini-grade na. Pero, saan kaya sa atin dito sa Pilipinas ang merong ganun? Yun nga ang isang nagiging problema, kaya para siguro hindi na masyadong maging complicated yung proseso, dapat pati yung

mga farmers, halimbawa tayong nasa marketing at processing ng brown rice, doon pa lang sa selection i-encourage natin sila as much as possible to use the same sizes. Lesser na yung mga amount ng di nababalatan. Tapos, I agree, talagang napakahirap yung abrupt change from over milled or well-milled punta ka sa brown rice. Talagang napakahirap mag-adjust yung taste ng tao. Hindi kaya pwedeng pag-aralan natin na sa milling, magkaroon muna sa MR kung paano i-adjust ang panlasa ng mga tao? Pagka puting-puti, iba yung lasa nya. Punta ka ngayon sa brown, talagang maninibago. Anyway, maraming mga pinag-usapan kanina kung paano natin ipo-promote. Baka pwede nating i-promote as alternative. Kasi yung iba, kung ipo-promote mo ito, parang ang pobre-pobre. Ang comment ko kasi, mahirap na nga kami, ganyan pa yung ipapakain mo sa amin. Merong mga ganung comments. Kasi nga, I agree din dun sa iba, na talagang ang pakiramdam nila na sa estado ng buhay nila, hindi mo pa sila pakakanin ng masarap, para bang awang-awa na sila sa kanilang sarili. Yun lang po at maraming salamat.

# THE WORKSHOP



## THE WORKSHOP

### GROUP 1: Increasing the Supply of Brown Rice in the Market

*Moderator:* Eulito U. Bautista, Ph.D., PhilRice

**Eulito U. Bautista:** So, we modify, we add, or we change some of these phrases or statements. So, maliwanag po ba?

*So we modify, we add or we change some of these phrases or statements. So is that clear?*

**Flordeliza H. Bordey:** Sir, basahin po muna kaya nating lahat?

*Sir, can we read it all first?*

**Eulito U. Bautista:** Yes. Yan ang isusunod natin ngayon. So, bibigyan po natin ng panahon para basahin natin ito. A resolution to increase the supply of brown rice in the market. Ito naman siguro walang, but take note - low- and middle-income - di natin pinag-uusapan ang high-end market na tinatawag (*reading of the draft resolution continued up to its ending*).

*Yes. We will do that right after this. We will give you time to read this. A resolution to increase the supply of brown rice in the market. Take note, this is low and middle-income, we were not talking here about what is called high-end market.*

**Eulito U. Bautista:** So, essentially po, ito po yung content ng draft of policy or resolution that we should be improving, or we should be finalizing at this time. So, ang pinaka-mganda po riyan, we go paragraph-by-paragraph or line-by-line para po siguro maganda yung ating ano or kung meron kayong ibang magandang mungkahi or suggestion kung papaano.

*So, essentially, this is the content of the draft of policy or resolution that we should be improving or finalizing at this time. So, it is better that we go paragraph-by-paragraph or line-by-line if ever you have other comments/suggestions on how we should do this.*

**Hazel Tanchuling:** Sir doon sa #2, kasi mukang malinaw naman po sa presentation lalo na ng FNRI na kung baga yung qualities ng brown rice nagko-compensate yung kanyang, kung baga negative nya.

*Sir, in number 2, I think the presentation is clear especially in the FNRI. The presentation that the qualities of brown rice will compensate for its negative effects.*

**Eulito U. Bautista:** negative effects to positive benefits.

**Hazel Tanchuling:** In fact, even yung presentation ng PhilRice na sinabi in the end ay pareho rin. Pero baka maganda rin ang sinasabi ng FNRI na di mo naman siya pinu-promote as rice lang na kakainin, but kinakain mo siya with ulam.

*In fact, even in the presentation of PhilRice, they have the same content in the end. But I guess it is better that FNRI will mention that you do not just promote brown rice as a rice that you eat, but instead you eat it with viand.*

**Eulito U. Bautista:** Ulam. Normally, may ulam.

*Viand. Normally with viand.*

**Hazel Tanchuling:** Oo. Baka pwedeng imbes na ilagay mo yung “not to pregnant women,” mas maganda na i-promote with other nutritious, complete ano pa rin

*Yes. Maybe instead of putting it “not to pregnant women”, it is better that you promote it with other nutrients.*

**Necitas B. Malabanan:** Balance

**Hazel Tanchuling:** Kasi pangit parang nananakot.

*Because it seems like we’re threatening people.*

**Isabelita M. Pabuayon:** Oo. Parang bawal e.

*Yes. I agree, because it seems prohibited.*

**Hazel Tanchuling:** We’re not promoting rice, but we’re promoting brown rice.

**Eulito U. Bautista:** Negative na ang dating nitong statement na ito.

*This statement seems negative.*

**Hazel Tanchuling:** Mas positive ba ang approach. So, baka mas-magandang ire-phrase yung 2nd paragraph to capture yung ganyan.

*A positive approach is better. Perhaps, it is better to rephrase the 2nd paragraph to capture that.*

**Eulito U. Bautista:** OK, very good.

**Flordeliza H. Bordey:** Suggestion po, baka pwedeng, yun nga, within a balanced diet framework, ganun ba yun?

*Suggestion, maybe we can revise it like, within a balanced diet framework, like that?*

**Hazel Tanchuling:** Oo, parang ganun.

*Yes, like that.*

**Eulito U. Bautista:** So, tanggal na yun.

*So we will remove that.*

**Hazel Tanchuling:** Tapos, baka pwede ring tanggalin yung overwhelms anti-nutrition.

*And then, can we also remove the “overwhelms anti-nutrition”?*

**Eulito U. Bautista:** Anti nutrition. May anti kasi. Anti nutrition.

*Anti-nutrition, because there is “anti”.*

**Hazel Tanchuling:** Yun nga for nutrition siya at saka.

*That is why, it is for nutrition.*

**Isabelita M. Pabuayon:** Malaking question pa yun.

*It is still a big question.*

**Eulito U. Bautista:** Meron pa lang anti-nutrition factor?

*Is there really an anti-nutrition factor?*

**Hazel Tanchuling:** Those will stick sa mind ng consumer. Ano ang anti-nutrition factor? So, binabanggit natin na talaga namang overwhelming ang benefits. So, dapat yun ang ma-highlight. Tapos i-promote siya na kasama ng balance, ng iba pang, kung baga, ng ulam, na doon mo pwedeng kuhanin yung kakulangan ng bigas.

*Those will stick to the mind of the consumers. What is anti-nutrition factor? So, we mentioned that there is an overwhelming benefits. So, I think that should be highlighted. Then, promote it together with a balanced viand where people can get the other nutrients lacking in rice.*

**Eulito U. Bautista:** So, any suggestion? Whereas the nutritional benefit of brown rice, ito yung overwhelms na yan, it's not anti-nutrition factor, how do we replace this?

**Isabelita M. Pabuayon:** are significant

**Hazel Tanchuling:** benefits of brown rice, together with the, what else?

**Eulito U. Bautista:** With fish and vegetable ba yung sinabi kanina? As a balance diet in combination with other food.

*Did we mention fish and vegetable earlier? As a balanced diet in combination with other food.*

**Flordeliza H. Bordey:** Yun na nga ang balance diet eh. Nutritional benefits of brown rice is optimize as long as it is

*That is already the balance diet. Nutritional benefits of brown rice is optimized as long as it is...*

**Hazel Tanchuling:** Baka pwede ipa-capture ng, kailangan bang ayusin na lang yun?

*Can we capture it? Or do we need to revise it?*

**Eulito U. Bautista:** Wala na itong “as long as it is promoted are significant in a framework of balanced diet.” Balance, may be, yun ata eh. Balanced diet. Parang ganun. Balanced diet may be. Ganun ba? Does it capture yung gusto nyong ano dito? O, imbes na sabihin nating significant sabihin na lang natin na whereas brown rice is nutritionally beneficial within a framework of balanced diet. Ganun ba? Please suggest. Mag-ano kayo. Baka kayo ang makaisip ng ano dito. Ano ang maganda dito. Pero actually, yung word na “overwhelms”. Doon sa presentation kaninang umaga. Except din doon sa phytic acid na sinasabi, practically overwhelming naman talaga yung kanyang advantage, significantly higher or mas-maganda talaga yung ano. So, except nga yung phytic acid, kung taken alone, may kasamang ulam, gulay o isda, parang medyo may isa-sacrifice kang mga nutrients na bumababa yung absorption, parang ganun. Parang mahina kasi ang dating. Napansin nyo? Hindi ganun ka-strong yung statement.

*We will remove this “As long as it is promoted are significant in a framework of balanced diet”. Balance, maybe, this is it. Does it capture what you want? Or instead of saying significant, we can say that “whereas brown rice is nutritionally beneficial in a framework of balanced diet”. But actually, the word “overwhelms” in the presentation earlier, except the phytic acid; practically brown rice really has an overwhelming advantage. Significantly, it is really higher or better. So, except the phytic acid, if brown rice is taken alone, with viand, vegetables or fish. You will sacrifice some nutrients where absorption decreased. If this is the statement, it is not that strong.*

**Hazel Tanchuling:** Pwede pong, kasi nandun sa taas yung kanyang benefits. Pwedeng yung sinabing word ni Liza. Whereas the benefits of brown rice is further optimized when eaten together with other nutritious food.

*I think we could put there its benefits. We can use the word said by Liza. "Whereas the benefits of brown rice is further optimized when eaten together with other nutritious foods."*

**Eulito U. Bautista:** Oo sige. The nutritional benefits of brown rice are further optimized when eaten together with other nutritious food. Bakit kayo nangingiti? Sige, sabihin nyo. Hwag kayong ngumiti. Magsalita kayo. Sige, Baby.

*Ok. The nutritional benefits of brown rice are further optimized when eaten together with other nutritious food. Why are you smiling? Don't just smile, say something. Ok, Ms. Renita "Baby" dela Cruz.*

**Renita SM. dela Cruz:** in combination with, not necessarily eaten, other nutritious food.

**Flordeliza H. Bordey:** How about further optimized when combined with balanced diet?

**Eulito U. Bautista:** Sige, o ayun. The nutritional. OK na ba ito? Mas-maganda na ba kesa yung kanina? Yung kanina, ang statement is, the nutritional benefits of brown rice overwhelms its anti-nutritional factors as long as it will be promoted to the right segments of the population. So when we say, nung tinanggal natin yung right segment of the population, like yung mga pregnant women, anemic children, practically parang ang ibig mong sabihin pwede nang i-promote.

*Are we okay with this? Is it better than the former? The statement before is the "Nutritional benefits of brown rice overwhelms its anti-nutritional factors as long as it will be promoted to the right segments of the population". So when we say, when we remove the "right segment of the population", like pregnant women, anemic children, practically you mean it is ready to be promoted.*

**Necitas B. Malabanan:** Yes, yun naman sinabi ng FNRI as long as

*Yes, that was said by FNRI.*

**Eulito U. Bautista:** Pwede na. What if we emphasize doon na even when taken by pregnant women? Just to put emphasis.

*What if we emphasize there that, "even if taken by pregnant women?" Just to put emphasis.*

**Hazel Tanchuling:** OK.

**Manuel Jose C. Regalado:** Gusto ko lang sanang i-highlight natin sa unang whereas yung pagka hindi lang considered kundi dinekler siya ng FDA na whole grain. Parang hindi lang siya kinonsider actually, kundi isinertipay na whole grain na siya, parang recognized or certified.

I just want us to highlight the first “whereas”. I want it not just considered, but also declared by FDA as whole grain. Actually, the word is not “consider”, but it is “certified” as a whole grain.

**Flordeliza H. Bordey:** Pwede po bang 2nd ano siya, another “whereas”? Can we put it as 2nd or another “whereas”?

**Eulito U. Bautista:** Pwede rin, sige tanggalin mo siya, whereas brown rice in named and accepted by US-FDA as a whole grain cereal.

*Ok we will remove it. Whereas brown rice is named and accepted by US-FDA as a whole grain cereal.*

**Flordeliza H. Bordey:** By FDA po ba?

*Is it by FDA?*

**Eulito U. Bautista:** US. US yun. US yung study. US Food and Drug Administration as a whole grain cereal.

*The study was from the US Food and Drug Administration as a whole grain cereal.*

**Hazel Tanchuling:** Anong good or pinaka significant?

*What is good or the most significant?*

**Manuel Jose C. Regalado:** Kasi parang nile-level na sya with other whole grains like oats or parang, at saka mahirap kasing, parang mahina rin ang dating pero talagang fact siya.

*It is because it was already being leveled with the other whole grains like oats, etc. It seems the statement is too weak, but it is the fact.*

**Eulito U. Bautista:** So, ilagay natin. Ano ba yung benefit niya as a whole grain cereal, high dietary fiber?

*So, let's put it this way. What is its [brown rice] benefit as a whole grain cereal? High dietary fiber?*

**Manuel Jose C. Regalado:** Yun na nga yun, nasa taas

*It is already stated above.*

**Flordeliza H. Bordey:** So, yun po bang “considered” gusto nyo po bang i-reword para mas-stronger, like proven?

*Do you want to reword “considered” to “proven”?*

**Isabelita M. Pabuayon:** is a healthy food muna. Diretso na.

*It is a healthy food first.*

**Necitas B. Malabanan:** Wala na yung “declared”.

*Remove the word “declared”.*

**Hazel Tanchuling:** And gusto lang naman nya na nakalagay ang certification by the US FDA.

*What they want to be put there is just the certification by the US FDA.*

**Eulito U. Bautista:** Although sa akin, hindi relevant yun kasi sa Pilipinas tayo. Sa tingin ko rin, para magkaroon naman tayo ng kung ano yung facts sa US ay doon na rin tayo. Mawala yung impression na ganun. Sa akin ganun din ang aking ano.

*Although, for me, it is not relevant because we are in the Philippines. I think, for us to have the facts from the US, we will go for that.*

**Flordeliza H. Bordey:** So tatanggalin na rin po na ito?

*So, we will remove this one?*

**Isabelita M. Pabuayon:** The 2nd “whereas”

**Necitas B. Malabanan:** It is already considered in the above statement.

**Isabelita M. Pabuayon:** Yes.

**Eulito U. Bautista:** O, pwede na rin sigurong sabihing “is a healthy food classified as a whole grain cereal that is rich in.” Huwag na nating banggitin yung US-FDA para mawala yung connotation na. Ano? OK lang ba yun? Healthy food that is rich in protein. Ah! OK. Sige. Palagay ko tanggal na ito. OK na ba yun pards? Accept mo na? OK lang. Sige! Ah! Teka! Teka! Bago ka bumaba siguro. Reviewhin ulit muna natin yung una at pangalawa. Baka meron pa kayong nakikita before we go to the next statement. Can we cite dito yung study of FNRI or ng DOST to further strengthen itong statement na ito? Ah, lagyan mo ng FNRI-DOST, baka yung iba kasi di alam ang FNRI, or siguro mas-magandang i-spell out na lang natin ito. OK. Maliban ba sa FNRI, lumabas din ba ito sa study na ipiniresent kanina sa PhilRice? Wala ano? Wala. More on technically sa brown rice. Sige. OK. OK na yan. Ang tanong ko lang,

doon kasi sa presentation kanina ni Henry Corpuz ng PhilRice, meron siyang tinatawag na lightly polished right brown rice. Ito kasing brown rice na ito, unpolished ito. Nilagyan kasi natin ng phrase na unpolished, meron din naman palang slightly polished brown rice. So, would it be more appropriate na para makuha na natin yung whether it is slightly polished or unpolished, tanggalin na natin yung word na unpolish? Or we need that just to distinguish this with white rice? Ano sa tingin nyo?

*I think we could say that “It is a healthy food classified as a whole grain cereal that is rich in...” Let us not mention the word “US FDA”, to remove the connotation. Is it Ok? Healthy food that is rich in protein. Before we proceed, let us first review the first and second statements. Can we cite here the study of FNRI or DOST to further strengthen this statement? Let us put FNRI, or can we spell it out for the sake of those who don’t know what is the meaning of FNRI? Ok. Aside from FNRI, does this appear also in the study presented earlier by PhilRice? No? More technically on brown rice. My question is, in the presentation of Mr. Henry Corpuz of Philrice, he mentioned what he called lightly polished brown rice. This brown rice is unpolished, we put a word “unpolish”, yet there is a phrase “slightly polished brown rice”. So would it be more appropriate for us to get whether it is slightly polished or unpolished? Do we remove the word unpolished? Or do we need that just to distinguish this with white rice? What do you think?*

**Hazel Tanchuling:** Sa akin, sa style magandang brown rice to white rice. Yung binabanggit sa marketing. Yung market, wala ng masyadong ano, dapat malinaw na.

*I think it is better. In terms of style, brown rice to white rice is better. The one mentioned in marketing, the market should be clear.*

**Eulito U. Bautista:** Tanggalin na natin yung naka-parenthesis. When you say brown rice, whether it is unpolished or slightly or partially polished, basta brown rice yun versus yung white rice na talaga namang alam natin. OK, sig. OK na po ba itong 1 & 2? Wala pong objection? Can we now move on to the 3rd statement? Dito muna tayo sa taas. 3rd statement. OK lang po ba yung first 2 lines? The general public is not aware of the benefits derived from brown rice leading to its low demand.

*Let us remove those inside the parenthesis. When you say brown rice, whether it is unpolished or slightly or partially polished, we know that it is brown rice vs. white rice. Is the statements # 1&2 are ok? No objection? Can we now move on to the 3rd statement? Are the first two lines ok? “The general public is not aware of the benefits derived from brown rice leading to its low demand.”*

**Hazel Tanchuling:** Pwede bang positive ulit ang approach?

*Can we make the approach positive again?*

**Eulito U. Bautista:** Ok, Ms. Hazel.

**Hazel Tanchuling:** Na instead of the general public is not aware of the benefits. Pwede bang, there is a need to increase awareness on the benefits of brown rice?

*Instead of the “General public is not aware of the benefits,” can we state it as “there is a need to increase awareness on the benefits of brown rice?”*

**Eulito U. Bautista:** By the general public. Just like that.

**Hazel Tanchuling:** Instead of “is not aware of the benefits”?

**Eulito U. Bautista:** Yes. Para hindi negative yung dating.

*Yes, for it not to look negative.*

**Isabelita M. Pabuayon:** Sir, excuse me. Ito ba’y iko-combine na we have only one resolution doon sa dalawa? Kasi mine-mention natin dito about demand. Kung mag-focus muna tayo with the very limited supply of brown rice in the market at present.

*Sir, excuse me. Will this be combined for us to have only one resolution for the two because we mentioned here about demand? If we focus first on the limited supply of brown rice in the market at present.*

**Eulito U. Bautista:** OK. Siguro tanungin natin sina Liza dito. Ano ba ang plan? Ito bang draft na ito, will it be combined with the output of the other group?

*Ok. Perhaps let us ask Dr. Liza Bordey about this. What is the plan? Will this draft be combined with the output of the other group?*

**Flordeliza H. Bordey:** Siguro Sir, in the interest of time, baka hindi na natin talaga mai-combine yung output ng other group. But ito po kasi ay magiging bases ng mga further actions na gagawin. So, siguro po, magandang i-consider yung suggestion ninyo na iwasan muna natin na pagsamahin sa ngayon. Lets stick to the supply idea.

*I think Sir, in the interest of time, maybe we cannot combine the output of the other group. But this will serve as the bases of further actions to be done. So, I think it is better to consider your suggestion not to combine these for now. Let us stick to the supply idea.*

**Eulito U. Bautista:** Although maganda nga rin yung strategy na para iisang statement. Isa na rin. Later on, hindi ngayon. Hindi sa workshop na ito. But later on as your ano....

*Although the strategy of uniting these to become one statement is good, but maybe later on, not in this workshop.*

**Flordeliza H. Bordey:** Opo Sir. Kasi Sir ipi-present naman ito mamaya ito sa loob so makikita nila. Actually po, nag-start tayo sa parehas na “whereas” with the other group. Ganito rin po yung mga premises. Kasi po yung “whereas”, yun ang pinaka premise ng mga natutunan natin with the speakers earlier. So, siguro po, magkakaroon din sila ng deviations. Mamaya pag pinresent ito sa whole group, makikita natin siguro yung similarities and differences nila.

*Yes Sir. Anyway, this will be presented later to the other group. Actually, we started in the same “whereas” with the other group. So this is the same premise. The “whereas” is the main premise from what we learned from the speakers earlier. So, I guess, they will also have deviations. I we presented it later to the whole group, we will see the similarities and differences.*

**Eulito U. Bautista:** OK, pero maganda nga rin yung comment na siguro yung word na demand dito, since they are more of the demand, tanggalin natin. Then yung, comment ni Hazel Tanchuling na lets make this first statement positive ang pagka-state rather than negative. So, yung suggestion mo kanina, whereas there is a need for the public to be aware of the benefits derived from brown rice to encourage suppliers. Wala na yung demand, to encourage suppliers, wala na yung demand, to encourage suppliers, parang ganun.

*Ok. But I think the comment regarding the word “demand” be removed is better; since they are more on the demand.*

**Isabelita M. Pabuayon:** Hindi ba pwedeng diretso na lang na sabihin natin na whereas there is a limited supply of brown rice in the market?

*Can we not directly state that “whereas there is a limited supply of brown rice in the market”?*

**Eulito U. Bautista:** OK

**Isabelita M. Pabuayon:** and if available doon lang sa mga supermarkets na nag-ano lang sa high income. I do not know. Kasi doon sa ating umpisa ay talagang naka-focus tayo sa low- and medium-income. Parang yun ang gusto nating i-target dito.

*If available only in the supermarkets that focuses only among the high-income group. I do not know, because when we started earlier, we*

*are really focusing on low- and middle-income. I think that is what we want to target.*

**Eulito U. Bautista:** Resulting to, tanggalin mo na yung resulting to. Hindi, OK lang siguro yung high price. Resulting to, tanggalin mo na yung large quantities.

*We should remove the phrase “resulting to”. I think high price is ok. Remove the “large quantities”.*

**Isabelita M. Pabuayon:** Hindi siguro, hindi result. Baka “and there is limited supply”.

*I think it is not “result”. Maybe “and there is limited supply”.*

**Eulito U. Bautista:** Whereas there is limited supply of brown rice in the market.

**Manuel Jose C. Regalado:** Yun na yung nasa taas.

*That was the one stated above.*

**Eulito U. Bautista:** Lagyan mo na lang ng “of” yung limited supply, of brown rice in the market and is only available among the high-income group in the society.

*We could place “of” in the limited supply of brown rice in the market and is only available among the high-income group in society.*

**Flordeliza H. Bordey:** Because of its high price.

**Eulito U. Bautista:** Tama ba? Hindi OK lang. Sige, i-improve pa natin ito para mas malakas ulit ang dating katulad ng mga naunang statements. Kasi ang importante dito sa policy statement or resolution, bawat phrases dapat strong ka even if you take it separately from others. It can stand on its own as a strong statement. Sige po.

*Is it correct? Ok let us further improve this one to be as strong as the first statement. What is important in the policy statement or resolution is that, each phrase should be strong even if you take it separately from others. It can stand on its own as a strong statement.*

**Isabelita M. Pabuayon:** Accessible and affordable? Do we want it like that?

**Flordeliza H. Bordey:** Kasi po parang yung, again, yung whereas, premise pa lang siya. Wala pa siya sa gagawin. Parang sinasabi natin na ito pa lang yung status.

*I think it is still a “whereas premise”. It has nothing to do yet. It is like saying, that it is still the status.*

**Isabelita M. Pabuayon:** Yes. It is like we’re stating the facts.

**Flordeliza H. Bordey:** Yes, ma’am.

**Isabelita M. Pabuayon:** It’s only accessible and affordable? Let’s put it and then take a look at it.

**Flordeliza H. Bordey:** Wala na po siguro itong “in the market”?

*I think we should remove the “in the market”?*

**Eulito U. Bautista:** Oo. Tama ba? OK na to? Whereas there is limited supply of brown rice in the market and it is only accessible and affordable for the high income consumers because of its high price. Pero alam ninyo mas-maganda sa tingin ko yung high price. Key kasi yun eh. That is one key way the limited supply, and ano kaya rather than affordable, mas-maganda na ma-state natin yung obvious na high price. Ano sa tingin nyo? Mag-suggest kayo ng ano? There’s limited supply on. It’s only accessible and affordable.

Yes. Is it correct? Whereas, there is limited supply of brown rice in the market and it is only accessible and affordable for the high-income consumers because of its high price. You know what I think. High price is good. That is the key. That is one key why the limited supply. What if instead of saying “affordable”, why not state the obvious, high price? What do you think? There is limited supply on. It is only accessible and affordable.

**Isabelita M. Pabuayon:** Pwede ring balikan na lang natin ulit. Let’s just maintain that para balikan na lang natin mamaya.

*We can return to that later. Let us just maintain that for now and return to it later.*

**Eulito U. Bautista:** OK, let’s move on to the next. “Whereas the cost of producing brown rice is high because of inappropriate milling equipment, high cost of assembling, so ito na yung factors, assembling certain kinds of paddy rice that are appropriate for brown rice production, and high cost of packaging the final product.”

**Hazel Tanchuling:** Kung ang target natin ay yung low- and middle-income families, kailangan pa ba nating high, i-package na, ok lang sa middle class kasi kailangan mong ibenta. Doon nga sa kabila, may market, kasi kung negotiated ang ating tinatarget na market like yung DSWD, hindi mo kailangan ng matinding packaging kasi ito only adds cost.

*If we are targeting the low- and middle-income families, do we need to package it? It is ok for the middle class because you need to sell it. In the other group, there have market, because if our market is negotiated like DSWD, you don't need an expensive packaging because it only adds costs.*

**Isabelita M. Pabuayon:** Parang sinasabi lang naman natin na ang cost ay mataas dahil dito.

*It is like we are saying that the cost is high because of this [packaging].*

**Hazel Tanchuling:** Pero kailangan ding we have to keep it in mind.

*But I think we have to keep that in mind.*

**Isabelita M. Pabuayon:** Pero kahit papaano meron din naming packaging di ba?

*But still there will be packaging right?*

**Hazel Tanchuling:** Pero hindi mo naman pag may feeding program dadalhin mo. Hindi naman naka-vacuum pack. I'm talking about yung maramihan at saka bulto-bulito na deliveries.

*But you will not bring it during feeding programs. Not the vacuum packed. I'm talking about large bulks of deliveries.*

**Flordeliza H. Bordey:** Related din po kasi yung packaging sa storability nya.

*The packaging is somehow related to the storability of brown rice.*

**Eulito U. Bautista:** Yes. Hindi lang yung sa price. Actually, the main reason kaya naka-vacuum pack yan is because of storage. Ang shelf-life kasi nito, yun ang essentially sinasagot nitong packaging. But, si Baby.

*Yes. Not only the price. Actually, the main reason why it was vacuum-packed is because of the storage. The shelf-life of brown rice is essentially the reason of packaging.*

**Renita SM. Dela Cruz:** What if, Whereas, there is a need for the public to gain access to the benefits brought about by brown rice?

**Renita SM. Dela Cruz:** Kasi we're dealing so i-highlight natin yung benefits niya. So, yung iniisip kong isusunod, Whereas, in order for the general public to gain access on the benefits brought about by brown rice or kailangang i-rephrase mo siguro. Parang there is a need to improve or increase the supply. Para pong ganun. Para patungo sa increase ng production.

*We are dealing here with, so we should highlight its benefits. So I think what should be next is, "Whereas, in order for the general public to gain access on the benefits brought about by brown rice...or does it need to be re-phrased? I think there is a need to improve or increase the supply. It is like increasing production.*

**Necitas B. Malabanan:** Excuse me. Kasi yun pong ine-state natin sa whereas ay yung mga facts na bakit mahal yang brown rice, at sa baba ng sa resolution kung ano dapat ang solution. Di ba ganun? Dapat i-state muna natin yung facts. Then, saka po. So, I think ok lang po yan. Sa baba po niyan.

*What we have stated in the "whereas" are the facts why brown rice is expensive, and in the resolution, we state the solution. Don't we state the facts first? I think it is already ok.*

**Eulito U. Bautista:** Actually, tinitignan ko yung logic nito. Nagsimula sa benefits at in-identify mo yung support ng DOST study. Then, pumunta sa limited supply. Bakit mahal? Pababa nang pababa. So, nakita ko naman tama din yung suggestion na, siguro doon na lang ipasok sa ilalim yung solution kung bakit ganito ang nangyayari. So, ako, practically kung titignan ko yung relation, ganun din dyan, related naman. Kasi ang pinag-uusapan ngayon ay yung cost. Sa tingin ko, pwede pa ring i-state ito. Although ang tingin ko ay hindi cost of producing, but cost of brown rice itself. Kasi itong binabanggit mo ay hindi lang processing kundi production. So, baka pwedeng the cost of brown rice na lang is high because of inappropriate. Tignan ninyo yung 3rd reason. Processing equipment. Ano ang ibig sabihin ng cost of assembling certain types of paddy rice? Yun siguro, paano natin isi-simplify yun? Baka naman ito ay. Ano sa tingin ninyo? Ok na ito, palagay ko. Inappropriate milling equipment. Tama naman. Actually, sa tingin ko tama yang 3rd reason. Baka ano.

*Actually, I observed the logic behind this. Starting with the benefits and identification of the DOST study. Then on the limited supply. Why is it expensive? And so on and so forth. I think the suggestion that the solutions must be put below is good. Practically, if I will observe the relationship, it is still essentially related. What we are talking now is the cost due to..I think we can still re-state this. Although I think, it is not the cost of producing, but the cost of brown rice itself. What you are mentioning here is not the processing, but the production. So maybe we can say the cost of brown rice is high because of inappropriate milling equipment. Look at the 3rd reason: Processing equipment. What do you mean by cost of assembling certain types of paddy rice? How can we simplify that? Inappropriate milling equipment. I think it is already correct, the 3rd reason.*

**Necitas B. Malabanan:** High cost of production

**Eulito U. Bautista:** High cost of production. Ah, si Mr. Villaflor. Si Engr. Villaflor.

**Isidro S. Villaflor:** Yung binanggit kanina ni Engr. Vasallo na different sizes.

*The different sizes that was mentioned by Engr. Vasallo.*

**Eulito U. Bautista:** Is this the one?

**Isidro S. Villaflor:** Yun. Yun, kung ano yung term na Tagalog. Ramble. Yung assembling certain types of paddy rice, ayun yun e.

*That was it. The Ramble. The assembling certain types of paddy rice.*

**Eulito U. Bautista:** OK

**Flordeliza H. Bordey:** Kasi kailangan po ng pagsamahin yung magkaka-size. At least, yung varieties na puro, low amylose.

*We need to gather those with the same size. At least those varieties with low amylose.*

**Isabelita M. Pabuayon:** Grading?

**Flordeliza H. Bordey:** Yes ma'am.

**Eulito U. Bautista:** Hindi ba, assembling ang right term doon? Or rather masmaganda, in reality, kung titignan natin yung ginagawa ng SL at ng ibang NGOs, may particular varieties na specific na lang doon. Hindi naman actually pinaghalo-halo. Anyway, hindi naman nila pinaghahalo-halo. Palagay ko baka ito ang ibig sabihin base sa na-share ko kanina, one reason kaya napapamahal yung brown rice, kadalasan kasi, yung high-eating quality na varieties na tinatanim, these are actually low-yielding. So, kung titignan mo economics nun. Magpo-produce ka ng 6 tonners versus 3-tonner. Kung hindi mo dodoblehin yung presyo mo sa 3-tonner, hindi magiging comparable sa 6-tonner in terms of income. Ang problema lang yung 6-tonner natin. Ito yung maaligasang. Ito yung matitigas. Ito yung white rice, essentially. Yung 3-tonner, ito yung medyo malagkit, na malambot, hindi mailigasang. So, parang ganun yung ano. May konting compensation in price and the performance of the varieties. Sa tingin, ko mas critical yun kaysa different varieties ang paghahaluin. Sa commercial rice, milling for white, ginagawa yan. Pero sa brown rice, palagay ko, hindi ginagawa yun. Ewan ko kung tama yung aking assumption.

*Is assembling the right term for that? Or maybe better if we will look at the work of SL and other NGOs. They have particular varieties that are only specific for that. Not actually rambled. I think this is the meaning of what I shared earlier. One reason why brown rice is costly is because the high-eating-quality varieties planted are actually low-yielding. If you*

*look at the economics of that, you will produce 6-tonner vs 3-tonner. This will not be comparable to 6-tonner in terms of income. But the problem is, our 6-tonner have low-eating qualities. This is the white rice, essentially. However, those 3 tonner are those that have good-eating-quality. That is why there is a little compensation in price and performance of the varieties. I think this is more critical than mixing up different varieties. For commercial rice, milling for white, it is done. But for brown rice, I think it is not done that way. I don't know if my assumptions are correct.*

**Flordeliza H. Bordey:** Ano po ilalagay natin? High cost of production of paddy rice that are appropriate for brown rice?

*What should we input? High cost of production of paddy rice that are appropriate for brown rice?*

**Eulito U. Bautista:** I think more of that. High cost

**Isidro S. Villaflor:** Tignan muna natin sino ba ang target clientele? Kung low-income or high-income.

*Let's look first at who the target clientele is? Low-income or high-income?*

**Eulito U. Bautista:** This is low-income. Low- and medium-income.

**Isidro S. Villaflor:** Kaya very particular ako sa recommendation ko. It's high time that NFA, sapagkat sila ang bumibili ng palay tapos meron din silang sariling warehouse. May rice mill sila. May drying facilities. Ang issue kasi ay affordability. Yung presyo ng brown rice na pwedeng bilin ng mga low-income families. Yun ang main issue. Ngayon, kung basta ang gusto natin ay brown rice at ang bumibili ay high-income group, I think that's not relevant. Kung issue lang din ang pag-uusapan natin. Kaya ang NFA siguro, ang tingin ko, ipasok natin diyan na bigyan ng mandate ang NFA para sa halip na well-milled rice at regular milled rice ang kanilang imi-mill, isama na yung brown rice na sila ang may capability. Yun ang issue na gusto ko.

*That is why I'm very particular in my recommendations. It is time that NFA, because it is the one that buys palay plus it has warehouse. It also has rice mills and drying facilities. The issue here is affordability, the price of brown rice that low-income families can buy. This is the main issue. Now, if we want brown rice, the one who buys are the high-income group. I think that is not relevant. If we are only talking of issue, NFA can do that. Maybe, we can input there that NFA should be given a mandate. So that instead of well-milled rice and regular milled rice produced, it will include brown rice because it has the capability. That is the issue I want.*

**Eulito U. Bautista:** Ilagay po nating solution yung suggestion ninyo.

*Let us put your suggestion as a solution.*

**Isidro S. Villaflor:** Ok.

**Eulito U. Bautista:** Below in the resolution: High cost of assembly of certain types we will lead to difficulty in determining certain types of paddy rice.

**Eulito U. Bautista:** Lagyan mo muna ng slash. Difficulty in determining certain types of paddy rice. Lagyan mo ng slash ito. Tanggalin mo yung comma diyan.

*Put a slash first. Difficulty in determining certain types of paddy rice.  
Put a slash here and remove the comma.*

**Flordeliza H. Bordey:** So ito po ba kanina, parang narining ko na gustong palitan ng high cost of production?

*I heard this is what you want, to change to high cost of production?*

**Eulito U. Bautista:** Hindi. Sige, tignan muna natin. So, as is muna yan at tignan natin. So, any other, meron kayong kwan dito? Sandali lang po. Sige po, Mr. Villaflor.

*No. Let's see first. So leave it as is. Any other comments? Ok, Mr. Villaflor.*

**Isidro S. Villaflor:** Yung second paragraph in-emphasize natin yung brown rice available in the market is only accessible and affordable to high-income groups. Bakit hindi natin baliktarin? Hindi accessible and affordable to low-income. Pag in-emphasize natin yung high-income groups, unless...Kya nga not accessible and affordable.

*In the second paragraph, let us emphasize that brown rice available in the market is only accessible and affordable among the high-income groups. Why not reverse it? Not accessible and affordable to low income groups. If we emphasize the high-income groups, unless...That is why not accessible and affordable.*

**Isabelita M. Pabuayon:** Pwede rin, pwede rin yun. It is not accessible and affordable.

*It could be not accessible and affordable.*

**Necitas B. Malabanan:** It is ok.

**Eulito U. Bautista:** To low- and middle-income groups. OK yan, sige. Balik tayo dito. OK na yan. So, hindi pa natin na-resolve yung second reason. High cost of assembly or difficulty in determining?

*To low and middle-income groups. It's Ok. We have not resolved yet the second reason. High cost of assembly or difficult in determining?*

**Isabelita M. Pabuayon:** Wala na yung high cost of assembly. Difficulty in na lang siguro. Diretso na.

*Remove the "high cost of assembly". Just put "Difficulty in" directly.*

**Eulito U. Bautista:** High cost of producing varieties that are appropriate for brown rice processing. There are certain varieties that are good to be eaten as brown rice. So, it could be one aspect on high cost of producing certain types of paddy rice that are appropriate.

**Eulito U. Bautista:** Tanggalin mo na yung brown rice rito.

*Remove the "brown rice" here.*

**Isabelita M. Pabuayon:** Alam na natin kung ano yun.

*We already know what rice is it.*

**Hazel Tanchuling:** Tama po ba yung pagkaintinde ko? Pag sinabi nating brown rice, parang tinanggalan mo lang ng husk at para bang, conceptionally, lahat ng varieties ng palay na tinatanim ng magsasaka ay pwedeng brown rice. So, therefore, kaya lang ano po, may hindi lang masarap? Pagka ang ginamit nilang variety na ano ay mahal pa sa ngayon? May variety po bang available na?

*When we say brown rice, it is like we're just removing the husk. Conceptionally, all varieties of palay planted by farmers can be converted into brown rice. But there are still other varieties that are not delicious, right? What if the varieties that they used still have a higher price? Is there any available variety now?*

**Eulito U. Bautista:** Sa ngayon, mahal pa yung mga varieties for brown rice na pang high-end. Although di natin sinasabi na may mga varieties, NSIC varieties registered sa NSIC, na pwede namang i-brown rice na kung tutuusin. So, that should be targeting the low-income families. Pero hindi lahat ay suitable for brown rice. Suitable yung eating quality. Suitable sila for brown rice production or processing, but not necessarily suitable for eating dahil talagang matigas. Ibig sabihin, pipili tayo ng mga varieties na more or less nasa acceptable limit. Hindi ito yung pang high-end. Now, when you produce it, it will produced by yield and then, hopefully, if you process it, it can reduce the cost of the sold output. That could be a good strategy. Kasi sa ngayon

namimili talaga ang market dahil kung titignan mo talaga ang high-end market natin, may karapatan silang mamili dahil may pera sila. Pera eh.

*For now, those high-end varieties used as brown rice still have higher prices. Although, we are not saying that, actually there are varieties, NSIC varieties registered in NSIC, that can be converted as brown rice. That should be targeting the low-income families. But not all are suitable for brown rice; the eating quality is suitable. There are varieties that are suitable for brown rice production or processing, but not necessarily suitable for eating because it is not soft. This means that we should choose varieties that are more or less within the acceptable limit. This is not the high-end, but when you produce it, it will produce by yield and hopefully can reduce the cost of the sold output. That could be a good strategy. Nowadays, the market will really choose, because they have the right to choose. They have the money and the capacity.*

**Hazel Tanchuling:** Oo nga, pero ibig sabihin kinokumbinse natin ang mga farmers na magtanim for brown rice production dahil we are targeting to sell in the high-end market?

*Yes. But that only means that we are convincing the farmers to plant for brown rice because we are targeting to sell at high-end market?*

**Eulito U. Bautista:** Lower-end market. Hindi naman papansinin ng high-end market yung mga ordinary varieties. Kaya yun and dapat. Ang kumbinsehin natin ngayon so that we can provide brown rice at lower cost than the prevailing cost sa market is we plant varieties that can be accepted. Pupwede na hindi yung maganda, kundi pupwede na rin naman. So, para may price penalty din yun as a result or lowering of prices. Pero ibig sabihin, hindi pupwede yung talagang matigas. Ibig sabihin, meron pa rin yung range na pipiliin mo. Sige po.

*Lower-end market. The high-end market will not pay attention to the ordinary varieties. Let us now convince the farmers to plant varieties that can be accepted so that we can provide brown rice at lower cost than the prevailing cost in the market. It is ok if the varieties are not that good, but at least they can be accepted. That is the price penalty for that as a result of lowering the price. But it means those varieties that are hard to eat are not really accepted. There is still a range that you can choose from.*

**Isidro S. Villafior:** Pero dito sa study ni Mr. Henry Corpuz enumerated dito yung 3 factors na nagiging unappealing yung brown rice sa consumers. Pero may solution na rito. Kamukha nung matigas, may solution na dito. In other words, practically lahat ng mga matagal nang mini-mention nating problema ay meron ng solution.

*But in the study of Mr. Henry Corpuz here, were the 3 factors that make brown rice unappealing to consumers. But there are already solutions indicated here like the hard-eating-quality of the varieties. In other words, practically all the problems we mentioned have solutions already.*

**Eulito U. Bautista:** We all see that.

**Isidro S. Villaflor:** Kasi yung binabanggit kanina on how to improve, may solution na rito.

*Because what we mentioned earlier on how to improve already have a solution here.*

**Eulito U. Bautista:** Yes, wala pong problema yun. Ang problema lang po, kung titignan ninyo yung apat na solutions, these will also demand high cost of investment sa producer. Isipin mo lalagyan mo ng, ano yun, ultrasonication tapos yung oven, ano yun? Microwave. Gaano ba kalaki yung microwave? It will demand big investment for the processor or producer. Hindi po ganun ka-practical. Kaya imbes na bababa yung cost lalong tataas yun kasi syempre babawiin ng producer yung investment. So, tama po yun those are good scientific solutions to the situation, but at this point when we are still introducing to the market it may not be practical to follow that recommendation at this time. We recognize that.

*Yes. We don't have a problem with that. The only problem is if we look at the four solutions, these will also demand high cost of investment to producers. Think about that, you will put ultrasonication in the oven, what is that? Microwave? It will demand big investment for the processor or producer. That is not practical. Instead of lowering down the cost, it will further increase because the producer will want to recover their high investment cost.*

**Isidro S. Villaflor:** So, pagkasinunod yang rekomendasyon nating iyan?

*So, if we will follow those recommendations?*

**Eulito U. Bautista:** Wala pa po. Justification pa lang po ito.

*No. This is still a justification.*

**Isidro S. Villaflor:** General issue doon sa paragraph na yun mukhang we are recommending them because of what we have stated and considered inappropriate milling equipment. So have we considered the appropriate milling equipment?

*The general issue in that paragraph is that we are recommending them because of what we have stated as high cost inappropriate*

*milling equipment. So have we considered the appropriate milling equipment?*

**Eulito U. Bautista:** Yes.

**Isidro S. Villaflor:** Yan ay facts na nagbibigay ng high cost. So, kung i-eliminate natin iyan ang ibig sabihin ay bababa ang cost.

*That is the fact that gives high cost. So, if we eliminate that, it means cost will decrease.*

**Eulito U. Bautista:** Ito nga po ang mga causes ng high cost of brown rice in the market that has to be addressed by the resolution. So, dito pa po iaa-address natin ang mga facts pababa po nang pababa and then later we will come up with the solution dito sa kwan, resolve, ganito na. Kaya importante pong ma-state natin itong mga problems na ito para alam sa resolution kung ano ang ina-address natin later on. So, tingin ko po, importanteng ma-define talaga ng husto itong high cost ng brown rice para mapababa by addressing those constraints. Sige po.

*These are the causes of high cost of brown rice in the market that has to be addressed by the resolution. So here, we will still address the facts, and then later we will come up with the solution. That is why it is very important that we state these problems for us to know what to address in the resolution later. So I think, it is important that we really define the high cost of brown rice and lower it down by addressing those constraints.*

**Isabelita M. Pabuayon:** Baka instead of the cost, the price na lang. Diretso. The price of brown rice is high.

*Perhaps, instead of cost, let's change it directly. The price of brown rice is high.*

**Eulito U. Bautista:** Sige. OK. Walang problema.

*Ok no problem.*

**Flordeliza H. Bordey:** So, ito po ba'y i-maintain pa natin, difficulty in determining?

*So, do we maintain this "difficulty in determining"?*

**Isabelita M. Pabuayon:** Pwede ng wala yang "difficulty in determining."

*We can remove that "difficulty in determining".*

**Eulito U. Bautista:** for brown rice production at, yung pangatlo, high cost of packaging. Can this stand as is? O, sige.

*For brown rice production and the third, high cost of packaging, can this stand as is?*

**Necitas B. Malabanan:** Yun po bang storability part na ng high cost of packaging? Kasi alam natin na hindi pwedeng i-store ng matagal ang brown rice. So, mako-cover ba?

*The storability part of high cost of packaging, because we all know that we cannot store the brown rice for long, can it be covered?*

**Eulito U. Bautista:** Not necessarily. Siguro ang magandang ilagay natin, tama yung point na mahal ang packaging natin because it is actually addressing shelf-life. So, ang suggestion ko, we mention the cost of packaging including yung shelf-life to this statement. Huwag na natin sigurong ilagay itong smaller quantities kasi whether it is in small or big quantities, packaging pa rin ang magma-matter, to address shelf-life. OK lang, shelf-life problems.

*Not necessarily. The point that packaging is really costly is correct because it is really addressing shelf-life. So my suggestion is, we mention the cost of packaging including shelf-life to this statement. I think we should not indicate the small quantities because whether it is small or big, it is still packaging that matters to address shelf-life. It is ok, the shelf-life problems.*

**Isidro S. Villaflor:** Yung high cost of packaging, mukhang ang tina-target natin doon ay high-end consumers?

*The high cost of packaging, are targeting the high-end consumers?*

**Eulito U. Bautista:** No.

**Isidro S. Villaflor:** Yung well-milled rice at regular milled, pag nagpunta kayo sa palengke, saan ba nakalagay? Nasa kahon lang yun. Tinatakal lang, ginaganun, tapos may plastic, ilalagay doon sa timbangan. Ganun lang. As simple as that.

*Those well milled and regular milled rice, if you go to the market, where is it usually placed in the box. It is only measured using a plastic bag and weighed. As simple as that.*

**Eulito U. Bautista:** Yes. We have no problem with that.

**Isidro S. Villaflor:** Kaya nga yung very high cost of packaging, hindi yung kasalukuyang sistema ng pagpa-package. Ang sinasabi natin yung proseso ng manufacturers, those big in the business, yung kanilang packaging hindi yung packaging doon sa mga low-income groups.

*That is why, the very high cost of packaging, not the usual system of packaging. What we are talking here is the process of manufacturers, those big in the business. Their packaging is not the packaging for the low-income groups.*

**Eulito U. Bautista:** Tama po yung obserbasyon ninyo pero ini-state po natin itong sitwasyon kung bakit mataas sa ngayon ang presyo ng brown rice. Ito po yung mga factors. Ngayon, yung sinasabi ninyo ngayong tinatakal lang, ilagay natin later on dito. Kasi ini-state lang po natin yung sitwasyon sa ngayon. OK po ba? So ngayon, kung OK na sa inyo ito, ito na lang panghuli na “whereas”. The government recognizes the importance of brown rice in improving the nutrition of the population and in achieving food security. OK lang po ba yan? Dahil kanina sa lectures nila nakaka-increase ng milling recovery etc. Yung nutrition naman ay na-state na rin dito. So, pupunta na po tayo sa resolution. Now therefore, be it resolve, OK tama po ba yung una na this body calls upon the government through the joint effort

*Your observation is correct. But what we are stating here is the situation on why brown rice is expensive today. These are the factors. Now, what you are saying about measuring using a container, we will put that here later. Because we are just stating the situation for now. Is it ok? Now, this is the last “whereas”. “The government recognizes the importance of brown rice in improving the nutrition of the population and in achieving food security.” Is this ok? In the lectures earlier, it can increase the milling recovery, etc. However, nutrition was already stated here. So, let us proceed to the resolution. Now therefore, be it resolve, OK is it correct? This body calls upon the government through the joint effort.*

**Isabelita M. Pabuayan:** But, that is demand.

**Eulito U. Bautista:** A, pwede bang itaas mo ng kaunti pa kwan, ibalik mo doon sa taas, doon kasi the government recognizes na e tapos you’re again calling the government. So, paano ba, how do we

*It was stated above that “the government recognizes”, then you are again calling the government? So, how do we do it?*

**Isabelita M. Pabuayan:** And also, demand ang nandoon sa ibaba nyan.

*And also, demand is still stated below.*

**Hazel Tanchuling:** Paano tayong po-position sa food production?

*How do we position in food production?*

**Eulito U. Bautista:** Supply is our...

**Eulito U. Bautista:** Ok. How will we do this? Before we go to that. I just want to point out, “in achieving food security”. In the whereas we never touch food security. May be we can put some paragraph that states that “with brown rice we increase yung food availability” because of high milling recovery. Somewhere there so that we do not immediately jump into “achieving food security”.

**Flordeliza H. Bordey:** Above or below?

**Eulito U. Bautista:** Before. So, whereas the production of brown rice can actually increase the milling recovery by 10% to 15% and can increase the supply of rice.

**Isabelita M. Pabuayon:** and thus increase the supply of rice

**Eulito U. Bautista:** and thus increase the supply of rice in the Philippines. In the country. Para makita na national ang implication nito. OK. So OK na iyan. Babalik tayo doon sa resolution.

*And thus increase the supply of rice in the Philippines. In the country; so it will show that the implication is national.*

**Isidro S. Villaflor:** Hindi natin ii-increase yung comparison between brown rice and, ano ba yung 10% to 15% to increase?

*We will not increase the comparison between brown rice and, what is the 10% to 15% increase?*

**Eulito U. Bautista:** Milling recovery.

**Isabelita M. Pabuayon:** Higher than white rice.

**Isidro S. Villaflor:** So, pag sinabi nating recovery by 10%, we are comparing brown rice with what?

*So if we say recovery by 10%, we are comparing brown rice with what?*

**Eulito U. Bautista:** Ah, parang ang gustong i-emphasize ni Mr. Sidro ay ilagay natin vis-à-vis white rice. Parang ganun. Sige.

*What Mr. Isidro wants to emphasize is we should indicate “vis-as-vis white rice”.*

**Isidro S. Villaflor:** Kanina pa natin ikinukumpara yung brown rice to increase

*We have been comparing brown rice to increase.*

**Eulito U. Bautista:** Siguro, later natin i-reword yung vis-à-vis na yun, baka di nila, white rice. Sige, at least nagkakaintindihan na tayo dyan. Ang comment dito kanina, this is already a demand. So, to create a demand, hindi ito supply, parang ganun. Siguro, baka pwede nating tanggalin ang government. Whereas brown rice is recognized in improving the nutrition of the population and in achieving food security para maging ano lang sa government. OK, ngayon pwede na nating banggitin na government. Pero tama ba ito? This is a demand, to create a demand.

*Maybe later we will re-word the “vis-à-vis white rice”. Ok, at least we already agreed on that. Let’s move on to the earlier comment, this is already a demand. So, to create a demand, this is not a supply. Can we remove the word “government” there? “Whereas brown rice is recognized in improving the nutrition of the population and in achieving food security”. Now, can we mention the “government”? Is this correct? This is a demand, to create a demand.*

**Isabelita M. Pabuayon:** That is the other groups’ topic.

**Hazel Tanchuling:** So, mass production tayo. How do you encourage supply production of brown rice?

*So we focus on mass production? How do you encourage supply production of brown rice?*

**Eulito U. Bautista:** Is Mr. Villaflor agreed on the supply?

**Isidro S. Villaflor:** Kasi tinitignan ko lang yung different enumerated departments. Actually, hindi lang yan ang involve eh. Even the private sector involve dyan. So, pag tinignan natin yan individually we exert reasonable efforts that are contrary to the creation of the National Nutrition Council na meron silang tinatawag na Philippine plan of actions for nutrition. Itong National Nutrition Council, merong organizations nationwide instead of enumerating those different departments, merong mga kasing international organizations na tumutulong sa atin. Merong national and international private organizations na tumutulong sa progama ng nutrition. Ang nagko-coordinate lahat niyan ay ang National Nutrition Council.

*I just observed the enumerated different departments. Actually, those are not the only ones involved; even the private sectors is also involved. So, if we look at it individually, we exert reasonable efforts that are contrary to the creation of the National Nutrition Council. It has what it calls Philippine plan of actions for Nutrition. The National Nutrition Council has the organizations nationwide. My point is, instead of numerating those different departments there are an international organizations that also help us in our nutrition program. The National Nutrition Council is the one coordinating all of that.*

**Eulito U. Bautista:** Any comment, are you in relative comment?

**Isabelita M. Pabuayon:** Pwedeng, resolve that this calls for effective public-private sector partnership in increasing the supply of brown rice in the market?

*It can be, "resolve that this calls for effective public-private sector partnership in increasing the supply of brown rice in the market"?*

**Eulito U. Bautista:** private-public sector partnership towards increasing the supply vis-à-vis the production and supply of brown rice, lagyan natin, for low- and middle-income, kasi yun ang target natin, para naka-define yung market natin, household.

*The private-public sector partnership towards increasing the supply vis-à-vis the production and supply of brown rice, let us also put for low-and-middle-income because that is our target is also defined, the household.*

**Isidro S. Villafior:** Iniha-highlight natin yung public-private partnership, ano?

*What? Are we highlighting public-private partnership?*

**Eulito U. Bautista:** Huwag munang barahin yan. I-paragraph nyo muna sa dulo. OK. So, tignan ho muna ninyo ito. OK na ba ito? Whereas, this body calls for effective public-private partnership towards increasing the production and supply of brown rice for low- and middle-income households.

*Just leave it as is first. Is this ok? "Whereas, this body calls for effective public-private partnership towards increasing the production and supply of brown rice for low- and middle-income households."*

**Isabelita M. Pabuayon:** or for the benefit. It is Ok.

**Eulito U. Bautista:** Whereas, this body calls for effective private and public partnership para naka-define yung market natin. Dito ba sa tingin ninyo do we need to specify ito? Kasi kung titignan ninyo, huwag munang tignan yung mga agencies, ang kanyang kuwan dito is to conduct massive information campaign, to create. Pero demand ito. Demand hindi supply.

*"Whereas, this body calls for effective private and public partnership" so that our market is defined. Do you think we should specify this? Just don't mind the agencies, to conduct massive information campaign, to create. But this is demand, not supply.*

**Hazel Tanchuling:** Puwede po before the public-private, maglagay muna ng that this body calls upon the Department of Agriculture to come up with a brown rice program, so gobyerno, and then kasunod naman yung to develop

a program for brown rice production, including the improvement of milling facilities etc.

*Is it ok if before indicating the public-private, we should first state “this body calls upon the Department of Agriculture to come up with a brown rice program”. So the government, and then next is to develop a program for brown rice production including the improvement of milling facilities, etc.*

**Eulito U. Bautista:** I guess she relates to the problem.

**Hazel Tanchuling:** to come up with, this body calls upon the Department of Agriculture to come up with a program on brown rice production. So improvements in milling facilities

**Eulito U. Bautista:** Brown rice program na lang but seeks to improve milling facilities, varieties for brown rice production, and packaging. Hindi. Huwag. Siguro yung packaging, yung shelf-life parang R&D. This is brown rice R&D program.

*Let us put brown rice program instead, but seeks to improve milling facilities, varieties for brown rice production, and packaging. Maybe the packaging, the shelf- life like R&D. This is brown rice R&D program.*

**Isabelita M. Pabuayon:** Let’s put brown rice program.

**Eulito U. Bautista:** Ang gusto mo, DA mismo ang tutumbukin ng resolution na yon? O, di ilagay na lang natin dito. Huwag na lang nating ilagay na government research institution kundi calls upon the government na lagyan natin ng Department of Agriculture and DOST. Huwag ng PhilRice. Ilagay mo DA para DA ang to come up with the program that seeks to, yun, to come up with the brown rice program. I-combine mo ito dito sa ibaba. Ito, to conduct research. Ilagay mo na lang doon. Ganun ba, Hazel? Para tumbok mo kaagad doon sa issue sa itaas.

*You want that we address the Department of Agriculture directly in the resolution? Ok let us indicate it here. Let us not state “government research institution”, but “calls upon the government” and put there Department of Agriculture and Department of Science and Technology. Let us not indicate PhilRice; instead, let us state DA so that the Department of Agriculture will come up with the brown rice program. Let us combine it below, “to conduct research”, for it to directly address the above question.*

**Hazel Tanchuling:** By hierarchy kasi. DA muna.

*Let us put DA first because it is by hierarchy.*

**Eulito U. Bautista:** DA muna, hindi DOST. Hindi, kasi yung DOST

*DA first, not DOST.*

**Hazel Tanchuling:** Kasi we are in the supply, hindi naman DOST ang supply.

*Because we are in the supply, DOST is not in the supply.*

**Eulito U. Bautista:** But the packaging is...

**Hazel Tanchuling:** Pwedeng ilagay na lang doon sa susunod. So, this is a call stated to the Department of Agriculture. Ngayon, if we want to come up with a call for the DOST, then ilagay na lang sa susunod specific.

*Can we indicate it to the next. So, this is a call addressed to the Department of Agriculture. Now, if we want to come up with a call for the DOST, then let us indicate it in the next.*

**Eulito U. Bautista:** OK. Tanggalin daw yung DOST. DA na lang muna.

*Ok. Let us remove DOST and retain the DA.*

**Eulito U. Bautista:** Sa PhilRice din kasi ipapagawa iyan. Pag sinabi mong DA, PhilRice din yun, lalo na kung R&D.

*Still, PhilRice will do that. Even if you say DA, it is still PhilRice that will conduct that, especially if that is R&D.*

**Flordeliza H. Bordey:** or to spearhead

**Eulito U. Bautista:** It is correct. Let us put to spearhead.

**Isidro S. Villaflor:** Sandali lang po. Mag-i-input lang po ako. I have a copy of the Philippine Plan of Action for Nutrition 2011 at, may I read? The national government adopted the Philippine Plan of Action for Nutrition in response to the need to provide more responsive action. The National Nutrition Council through its nationwide network continues to provide, restructure and develop a mechanism for coordinating and integrating the implementation of the Philippine plan. Prepointiery structure to which in effect are required to coordinate and integrate all the programs. Doon sa National Nutrition Council miyembro ang Secretary of Health, Secretary of DA, and other agencies. So, yung highest policy making body, the National Nutrition Council. Ngayon, siguro manghingi lang kayo ng kopya ng Philippine Plan of Action for Nutrition para maging valid ang mga provisions diyan. Ang alam ko 1970s pa nang na-create ang National Nutrition Council. The national council is composed of executives from different agencies hanggang sa bumaba, sa regional, city, municipal levels.

*I have a copy of the Philippine Plan of Action for Nutrition 2011, may I read it? The national government adopted the Philippine Plan of Action for Nutrition in response to the need to provide more responsive action. The National Nutrition Council through its nationwide network continues to provide, restructure, and develop a mechanism for coordinating and integrating the implementation of the Philippine plan. Prepointery structure to which in effect are required to coordinate and integrate all the programs. The Secretary of Health, Secretary of DA, and other agencies are members of National Nutrition Council. Now, maybe, we could ask for a copy of the Philippine Plan of Action for Nutrition to validate. What I know is that, the National Nutrition Council was created in 1970s. The national council is composed of executives from different agencies down to the regional, city, and municipality levels.*

**Eulito U. Bautista:** So ano po ang gusto ninyong mangyari?

*So, what do you want to do?*

**Isidro S. Villaflor:** We include the National Nutrition Council in our resolution because it is mandated by law to provide the structure and mechanism for coordinating and integrating the implementation of the Philippine Plan of Action for Nutrition. Kasi, kung familiar kayo, ang mga Regional National Nutrition Committees ay mandated by that law na sila actually ang nagconduct ng nutrition celebration.

*We include the National Nutrition Council in our resolution because it is mandated by law to provide the structure and mechanism for coordinating and integrating the implementation of the Philippine Plan of Action for Nutrition. If you are familiar with the Regional National Nutrition Committee, they are mandated by law, to conduct the nutrition celebration.*

**Eulito U. Bautista:** Sa tingin ko, more on advocacy ito. Yung unang tinanggal mo, kanina, actually yun yun.

*I think, this is more of an advocacy. The one you removed earlier, was actually the one.*

**Hazel Tanchuling:** Maybe, in recognition.

**Eulito U. Bautista:** OK, let us include that later on. The DA coordinates with the National Nutrition Council in promoting and advocating brown rice consumption.

**Isidro S. Villaflor:** and commercialization

**Eulito U. Bautista:** Siguro, hindi promoting kundi advocating brown rice consumption in the Philippines na lang. Oo, kasi national Yun. From the national to the local level di ba, di ba OK?

Pwede bang bumalik doon sa unang resolution? Paki lagay dyan, after fitting but cost-efficient packaging material, among others, because baka ma-limit lang yung rice program diyan. Fitting but cost-efficient packaging material, among others, para may room for taking in other ano.

*I think not promoting but instead advocating brown rice consumption in the Philippines. Yes, because it is national. From the national to the local level. Is this ok?*

*Can we go back to the first resolution? Can we indicate there, after fitting but cost-efficient packaging material, among others; so that the rice program will not be limited only to that. "Fitting but cost-efficient packaging material, among others".*

**Flordeliza H. Bordey:** OK lang po ba dito na spearhead research and promotion, tapos tatanggalin ko na po itong "develop" at saka "determine"?

*Is it ok if we indicate here "spearhead research and promotion," and then remove "develop" and "determine"?*

**Eulito U. Bautista:** O sige. Oo. Research and promotion of appropriate rice varieties, suitable milling equipment, and fitting but cost-efficient packaging material, among others. Sige. Mamaya na lang natin tignan ulit yung order. Tingnan na lang muna natin itong panghuli. This is the last statement. Resolve that this body calls upon government research institutions to conduct research, meron ito, di ba? Meron ito kanina, di ba? Resolve that this body calls upon Congress and the Department of Finance to conduct a policy study on giving tax credit to rice milling and retailing enterprises for every particular volume of brown rice sold or harvested. Anong gusto bang mangyari dito? Sige, Hazel.

*Ok. "Research and promotion of appropriate rice varieties, suitable milling equipment, and fitting, but cost-efficient packaging material, among others". Let us take a look at the order later. Let us look at the last statement, "Resolve that this body calls upon government research institutions to conduct research". We have this earlier, right? "Resolve that this body calls upon Congress and the Department of Finance to conduct a policy study on giving tax credit to rice milling and retailing enterprises for every particular volume of brown rice sold or harvested". What do you want to do with this? Yes, Hazel?*

**Hazel Tanchuling:** Kasi papasok yung advocacy na NFA yan sa supply.

*That NFA advocacy might be included in the supply topic?*

**Eulito U. Bautista:** Is that supply? By the National Food Authority?

**Hazel Tanchuling:** Kung baga, yung mandate niya ay to buy the palay farmers para palakasin ito so pwede rin i-convert into brown rice production. Ito rin kasi yung kinukuhanan ng bulto ng ahensya, halimbawa ng DSWD, at kung anu-ano pang mga local governments, halimbawa, for feeding program. Massive na distribution kapag may kalamidad. Yaon yung ginagamit kung gusto nating low-income at saka to strengthen its palay procurement program because only through this program kaya niyang makapagbigay ng bulto-bultong rice to low-income.

*It's mandate of buying palay will empower farmers so that they will be able convert those palay into brown rice production. This is also where other agencies procure their bulks of palay supply. For example, the DSWD and other local governments during their feeding programs; massive distribution during calamities; those were the supplies that they use. So, if we want low-income. let us strengthen its palay procurement program because only through this program can it supply rice to low-income even in large volume.*

**Eulito U. Bautista:** Palay procurement program for producing brown rice that can be used by the government in its promotion to low

**Hazel Tanchuling:** in its promotion to low-income groups. Hindi lang yung palay procurement, pati yung kanyang capacity. Kasi ngayon, napakakaunti ng kanyang milling capacity. So, kung meron syang in increasing its milling capacity

*In its promotion to low-income groups. Not only the palay procurement, but also its capacity because now, it's milling capacity is too small. So, if it has "in increasing its milling capacity".*

Eulito U. Bautista: To strengthen its palay procurement program and its milling capacity.

**Necitas B. Malabanan:** Di po ba malakas ang milling?

*Is the milling capacity strong?*

**Hazel Tanchuling:** Hindi na po. Sa totoo, napakaliit lang ng kanilang nami-mill pinasa-subject na rin nya sa private.

*Not anymore. In fact, they only mill small amounts and they subject them to private (millers).*

Eulito U. Bautista: Wala na. Dinadala na rin sa private. Kasi yung mga milling dati noon, wala na. Matagal na yun. Di naman nila mininteyn. OK na ba yan? Sige po.

*No more. They now bring them to the private (millers) because they failed to maintain their milling (equipment).*

**Isidro S. Villaflor:** Yung feeding program ay ini-specify ng gobyerno doon sa mga pre-schoolers, school children. Di ba pwedeng idagdag natin yung senior citizens? DA coordinates with the National Nutrition Council in advocating brown rice consumption among senior citizen associations and its inclusion in the Filipino diet. Ang goal kasi natin ay yung common poor na syang majority ng ating population. Kinakailangang masanay silang isama na sa kanilang pagkain and its inclusion in the Filipino diet.

*The feeding program is a government program that directed at pre-schoolers and school children. Can we not add the senior citizens? "DA coordinates with the National Nutrition Council in advocating brown rice consumption among senior citizen associations and its inclusion in the Filipino diet". Our goal is the common poor that make up majority of the population. They need to be used to including it in their meals and its inclusion in the Filipino diet.*

**Eulito U. Bautista:** So, tapos na tayo supposed to be.

*So we are through, supposed to be.*

**Hazel Tanchuling:** Paano natin ia-address na makita ng pamilya mismo ang individual farmer na mag-brown rice production bilang magsasaka.

*How can we address the family seeing the individual farmer engaged in brown rice production?*

**Eulito U. Bautista:** Doon nga siguro sa advocacy at sa promotion. Kasama na rin sila dito. Kasi when you say advocacy

*I think in advocacy and promotion. They are already included here, because when you say advocacy...*

**Hazel Tanchuling:** Or pwede po bang doon sa taas, the Department of Agriculture, doon sa brown rice program, hindi lang siya research and promotion on rice varieties kundi paano mo ilalabas diyan yung extension o kaya insentibo sa mga magsasaka?

*Can we state above that, "The Department of Agriculture", in the brown rice program. It is not only promotion but, research and promotion of rice varieties. How can we state extension there or incentives for farmers?*

**Isabelita M. Pabuayon:** To provide the necessary support services and incentives for farmers to engage in brown rice production, marketing and consumption.

**Eulito U. Bautista:** OK na? Teka, meron pa tayong kulang kasi wala na tayong panahon. Kung meron pa kayong pahabol, siguro bring out na lang ninyo sa joint session mamaya. Ang objective nito ay para mabigyan ng tax incentive, especially yung brown rice, at cheaper cost kasi.

*Okey? Since we are running out of time, if you have other suggestions, you may bring it up during the joint session later. The objective of this is to give tax incentives especially brown rice, at cheaper cost.*

**Hazel Tanchuling:** Huwag na yan. Anong klase? Pwede po bang policy study na lang?

*Please do not include that, what kind? Can it not be policy study instead?*

**Isabelita M. Pabuayon:** They don't conduct policy study.

**Hazel Tanchuling:** Baka pwede, hindi naman isang resolution na i-include kasi pwede naman gawin yan ng PhilRice. Kailangan pa ba ng resolution?

*Maybe not in one resolution because PhilRice can do that. Do we need a resolution?*

**Flordeliza H. Bordey:** Kasi sa Department of Finance ito. Sila kasi yung may mandate sa mga taxes. Ngayon, ang tax credits ay ibinibigay sa isang industry kapag nagsisimula pa lang siya para ma-encourage mo yung suppliers. Yun bang tax credit ay tinitignan natin bilang isang strategy or what? Baka naman hindi na siya kailangan.

*That is Department of Finance's. it has the mandate to tax. Now, the tax credits are given to a starting industry to encourage suppliers. Do we consider tax credits as a strategy or what? Perhaps, it is not necessary.*

**Isabelita M. Pabuayon:** I think it is discouraged, but not to conduct a policy study.

**Eulito U. Bautista:** to give instead?

**Isabelita M. Pabuayon:** Yes, to be direct.

**Eulito U. Bautista:** Hindi, kasi ganito ang situwasyon. Karamihan kasi ng brown rice producers ay cottage industry, and normally itong maliliit, na ito they don't pay taxes. Halimbawa farmer ka, maganda yung yung pino-produce mo. Nagbabayad ba ng taxes yung farmers? Normally, hindi kasi part of the process. Ngayon, sino ba ang nangangailangan ng tax credits? Karamihan diyay ay mga large producers like SL Agritech. Sila yung makikinabang dito o yung mga big millers, for instance. Yung mga gumagamit ng may OR, naka

register na may business, or as a business entity. At saka kung titignan mo naman, baka tax credits might not be necessary.

*The situation is this, majority of brown rice producers are cottage industry; normally, these small firms usually don't pay taxes. For example, you are a farmer, and your produce is good. Do farmers pay taxes? Normally, they don't because it is part of the process. Now, who needs tax credits? Many of them are large producers like SL Agritech. They are the ones who benefit from this, or the large millers, for instance. Those who use OR, was registered as business, or as a business entity.*

**Necitas B. Malabanan:** Pag nag-increase na po yung demand eh di kikita na sila. So hindi kailangan.

*If the demand will increase, they then will have profits. So, it is not necessary.*

**Eulito U. Bautista:** Sa tingin ko rin. Ang makikinabang dito ay sila Henry, no offense ha?

*No offense to Henry Lim, but I also think that he will be the one who will benefit from this.*

**Flordeliza H. Bordey:** I will delete it.

**Eulito U. Bautista:** O sige, isa pang taas, tignan ninyo yung dito sa resolve na ito. Kasi ang gusto kong Makita, yung sequence. Tignan ninyo kung tama yung sequence ng resolution natin. Inuna natin itong DA. Maganda itong inilagay natin kasi binanggit sa itaas yung justification. Ano? Ito, DA pa rin, kasama ang mga farmers, and then private-public partnership. And then ditto, coordination of DA with National Nutrition Council, which is ano, and then yung NFA. Ito ang sequence natin, o baka mas magandang pagsamasamahin na natin and DA sa taas? Ganun din ang NFA, at ito'y ilagay na lang natin sa baba, parang ganun? Yan ihuli na lang. OK, pwede bang diyan sa huli na yan? Explicit tayo sa role na iyan, yung strengthening cooperatives to support this kind?

*Try to look at the sequence of the resolution if it is correct. We placed DA first. It is good that we stated the justification above. This is still DA with the farmers, then private-public partnership, then the coordination of DA with the National Nutrition Council, and then the NFA. This is the sequence, or is it better if we place all those pertaining to DA above? Can we put NFA below? The role is explicit, strengthening cooperatives to support this kind?*

**Eulito U. Bautista:** Siguro po doon sa farmers? Pakitaas lang. Provide the necessary support services to farmers and farmers' group/cooperative

engaged in brown production, marketing, and consumption. Kasi sa totoo lang, maraming mga NGOs na brown rice cooperatives na involve dito. Maraming salamat.

*Perhaps in the part of the farmers, "Provide the necessary support services to farmers and farmers' group/cooperative engage in brown production, marketing, and consumption. In fact, there are many NGO brown rice cooperatives that were involved here. Thank you very much.*

## **Group 2: Increasing Public Awareness and Acceptability of Brown Rice**

*Moderator: Cesar P. Mamaril, Ph.D., PhilRice*

### I. Reading of Resolution

**Cesar M. Mamaril:** “Whereas, brown unpolished rice is considered as a healthy food and is higher in dietary fiber, vitamins, minerals, fat and anti-oxidants compared to milled or polished rice; (we emphasized that there are some questions about the difference between milled and brown rice, but anyway, we have to enclose those words unpolished as polished in order to further clarify the difference between the two.)

Whereas, the general public is not aware of the benefits derived from brown rice leading to its low demand, which in turn discourages suppliers to supply brown rice in large quantities resulting in its high price in the market; and Whereas the cost of producing brown rice is high because of lack of appropriate processing equipment and high cost of packaging the final product into smaller quantities; and

Whereas, the government recognizes the potential of brown rice in improving the nutrition of the population and in achieving food security.

Now, therefore, be it resolved that this body calls upon the government through joint efforts of the departments, the Department of Agriculture as the lead agency, Department of Health, Department of Education, Department of Science and Technology, Department of Trade and Industry, Department of Interior and Local Government, and the Department of Social Welfare and Development to conduct a massive information campaign to create a sustained demand for brown rice; and

Be it further resolved that this body calls upon policy makers, religious groups, civil societies, farmers’ organizations, and local government units to support the advocacy on brown rice consumption under the premise that brown rice has higher milling recovery, potential economic impact because of lesser rice importation, as well as health benefits advantageous to the constituents’ areas of responsibility; and

Be it further resolved that this body calls upon hotels, restaurants, and fast food owners and operators to create dishes with and featuring brown rice and offer these as additional options for their customers;

Be it further resolved that this body calls upon educational institutions, to integrate the benefits of brown rice in their curriculum and require their cafeteria operators to offer healthy food for their student population, which includes meals with brown rice as students from all walks of life should be able to combat hidden hunger, through the most basic food that we eat: rice; and

Be it further resolved that this body calls upon public and private hospitals, health care professionals, and health and wellness centers to help educate

patients and clients on the health benefits of eating brown rice as an aid to maintaining good health and preventing future ailments, along with proper diet and healthy lifestyle; and

Be it further resolved, that this body calls upon mass media practitioners using various media: tv, radio, print, and non-traditional advertising through their various organizations KBP, adboard, and so forth to be partners in advocating the health benefits of brown rice and ensuring these reach all segments of society particularly the low- to middle-income households; and

Be it further resolved that this body calls upon government research agencies: Department of Agriculture, Department of Science and Technology, Institute of Higher Learning, to continue research on brown rice to address knowledge gaps such as increased shelf-life, nutrition and quality; and

Be it further resolved that this body calls upon the National Food Authority to include brown rice in its current mandate and develop strategies to distribute cheap rice to the public as well as similar authorities who can grant license to sell rice to rice traders or other similar individuals to encourage the inclusion of brown rice in their rice trading and retailing activities to make it more affordable and accessible to the general public; and

Be it further resolved, that this body calls upon existing agriculture distributors and retailers of brown rice to be active partners and to find funds in the campaign for advocating brown rice consumption working along with government agencies who are mandated to lead the advocacy as a showcase of a modern public-private partnership.

**Cesar M. Mamaril:** As you notice, there are some similarities, and I think there should be some combination of the two resolutions.

**AREyes:** If we can go back to the title of the resolution, it speaks of the income level. The minimum income and the low income level families. And now, we are speaking of segments of society like the military. Are we not confusing this, unless we take this organizations as low-income and middle-income.

**Cesar M. Mamaril:** What's the conflict with the military?

**AREyes:** No, because we are speaking of the income levels and not a segment of an organization.

**Cesar M. Mamaril:** So, there's no need to mention a particular group?

**AREyes:** Yes, so we should stick to the income levels.

**Cesar M. Mamaril:** So, there should be no mention about the military?

**AReyes:** Yes. Thank you.

**Rhemilyn Z. Relado:** Bago po natin I close and program natin, meron pa ba kayong further comments or suggestion?

*Before we close our program, do you have further comments or suggestions?*

**Eulito U. Bautista:** There should be a move to combine the two resolutions or policy statement or something. Mas-maganda kasi na iisa na lang yung policy statement natin kung mapagsasama yung dalawa into one resolution. Palagay ko mas maganda. Mas malakas ang dating.

*There should be a move to combine the two resolutions or policy statement into one or something. I think this is much better and stronger.*

**Rhemilyn Z. Relado:** Noted sir. Any other comments? Do we agree that we have to combine these two resolutions into one?

**Assembly:** Yes

**Rhemilyn Z. Relado:** And that all resolution written dito ay i-mmerge natin and titignan natin how they conflict or conform dun sa ideas. So, hahayaan nyo ba na ang PhilRice ang mag-ayos nito? May tiwala po ba kayo sa PhilRice?

*All written resolutions here will be merged and let us try to look how they conflict or conform in the ideas. So, will you let PhilRice do the job? Do you trust Philrice?*

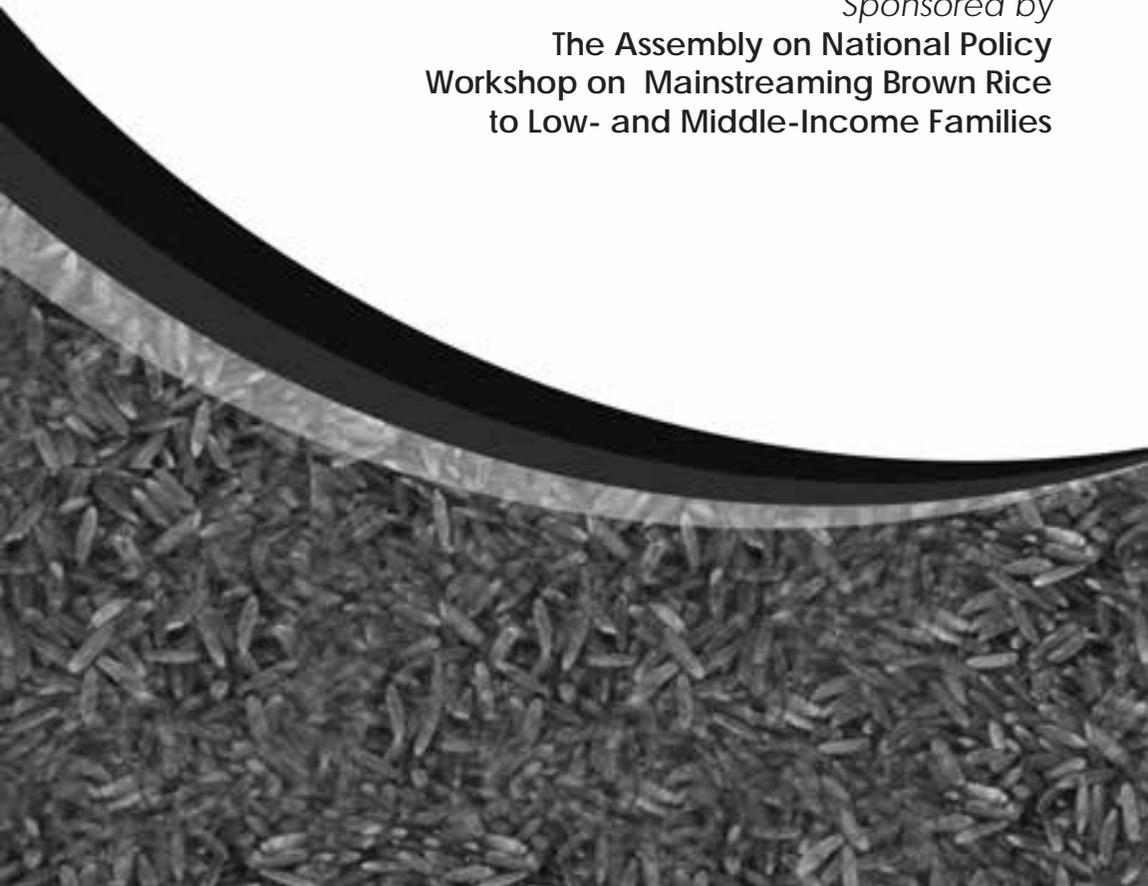
**Assembly:** yes

**Rhemilyn Z. Relado:** Ok. Thank you very much.



# A RESOLUTION TO INCREASE THE MARKET SUPPLY, ACCEPTABILITY, AND PUBLIC AWARENESS OF BROWN RICE

*Sponsored by*  
The Assembly on National Policy  
Workshop on Mainstreaming Brown Rice  
to Low- and Middle-Income Families



## **A RESOLUTION TO INCREASE THE MARKET SUPPLY, ACCEPTABILITY, AND PUBLIC AWARENESS OF BROWN RICE**

Sponsored by  
The Assembly on National Policy Workshop on Mainstreaming  
Brown Rice to Low- and Middle-Income Families

WHEREAS, brown (unpolished) rice is a healthy food that is higher in dietary fiber, vitamins, minerals, good fats, and antioxidants compared with milled (polished) rice; and

WHEREAS, the importance of brown rice is recognized in improving the nutrition of the population and in achieving food security; and

WHEREAS, brown rice production has a milling recovery that is 10 percentage points higher compared to milled rice and, thus, increase the supply of rice in the country; and

WHEREAS, the general public is not aware of the benefits derived from brown rice leading to its low demand, which in turn, discourages suppliers to produce brown rice in large quantities; and

WHEREAS, the price of brown rice is high because of lack of appropriate processing equipment, high cost of producing certain types of paddy rice that are appropriate for brown rice production, and high cost of packaging that can address shelf-life problems; and

NOW, therefore be it

RESOLVED, that this body calls on the Department of Agriculture (DA) to create a Brown Rice Program that shall spearhead and initiate collaborative research work on brown rice with the Department of Science & Technology, the Institutes of Higher Learning, and the private sector to address knowledge gaps on increased shelf-life, nutrition, quality, appropriate rice varieties, suitable milling equipment, and fitting and cost-efficient packaging materials, among others; results of which shall be made available to industry stakeholders; and be it further

RESOLVED, that this Brown Rice Program shall work with the Department of Health, Department of Education, Department of Science & Technology, Department of Trade & Industry, Department of Interior and Local Government, and Department of Social Welfare and Development, in conducting massive information campaigns to create a sustained demand for brown rice; and be it further

RESOLVED, that this Brown Rice Program shall coordinate with the National Nutrition Council in advocating brown rice consumption and commercializa-

tion in the Philippines and its inclusion in the Filipino diet; and be it further

RESOLVED, that this body calls on the DA to provide the necessary support services and incentives to farmers and farmer groups and cooperatives to engage in brown rice production, marketing, and consumption; and be it further

RESOLVED, that this body calls on the National Food Authority to include brown rice in its current mandate, strengthen its palay procurement program, improve milling and warehousing capacity for producing brown rice that can be used in rice distribution programs such as food for work and other feeding programs, and create strategies to provide affordable brown rice to the public; as well as similar authorities that can grant trade license, to encourage the inclusion of brown rice in their licensees' trading and retailing activities, thus, making brown rice more affordable and accessible to the general public; and be it further

RESOLVED, that this body calls upon Department of Education and other educational institutions to introduce information about the benefits of brown rice in their curriculum and require their cafeteria operators to offer healthy food for their students, which includes meals with brown rice, as students from all walks of life should be able to combat hidden hunger through the most basic food they eat: rice; and be it further

RESOLVED, that this body calls upon restaurants and fastfood owners and operators to create dishes featuring brown rice and offer these as additional option for their customers; and be it further

RESOLVED, that this body calls upon public and private hospitals, healthcare professionals, and health and wellness centers to help educate patients and clients on the health benefits of eating brown rice as an aid to maintaining good health and preventing future ailments along with proper diet and a healthy lifestyle; and be it further

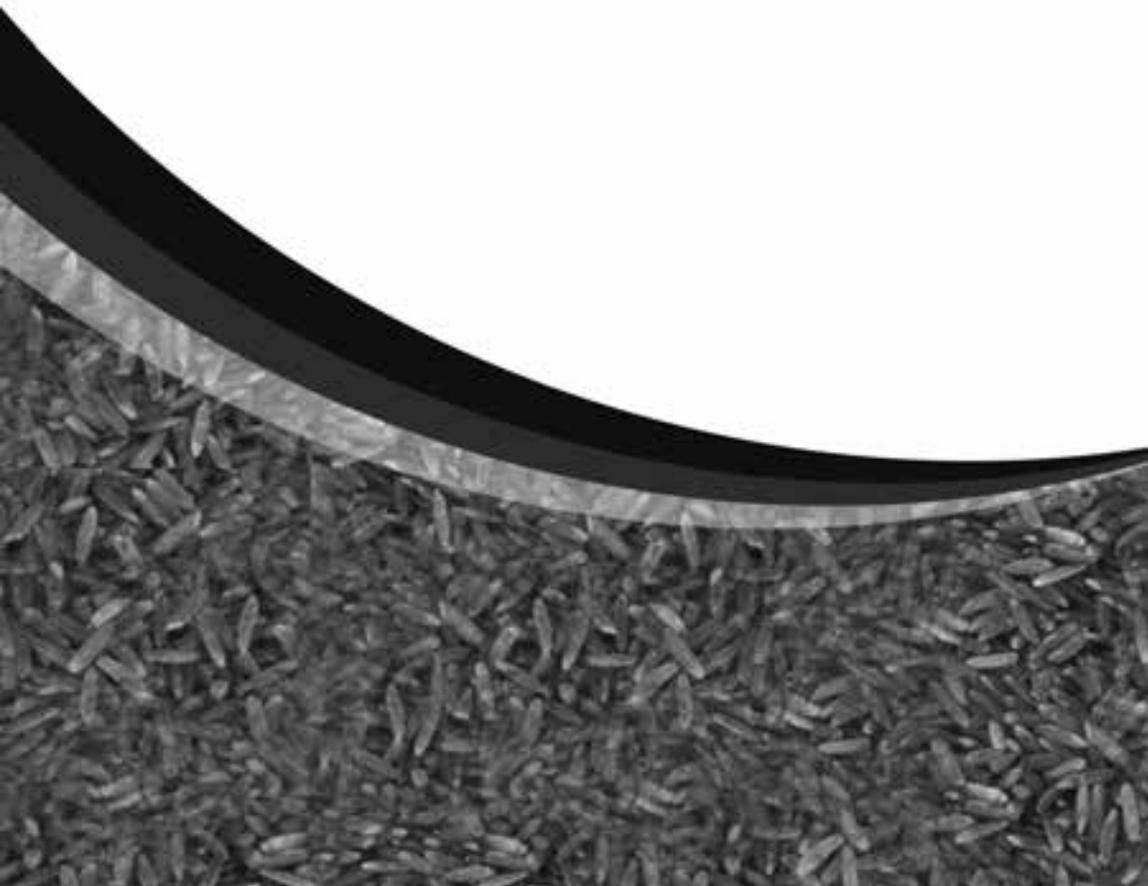
RESOLVED, that this body calls upon Mass Media practitioners using various media vehicles (TV, radio, print, and non-traditional advertising) through their various organizations (Kilusan ng mga Brodkaster sa Pilipinas, Adboard, among others) to be partners in advocating the health benefits of brown rice and ensuring its reach in all segments of society, particularly the low- to middle-income households; and be it further

RESOLVED, that this body calls upon local government units, religious groups, civil society, farmers' organizations, and existing distributors and retailers of brown rice to be active participants and provider of funds in advocating brown rice consumption, working along with government agencies who are mandated to lead the advocacy, as a showcase of a model public-private-partnership;

**this 29th of September 2011, in Oasis Hotel, Clark Field, Pampanga.**



# APPENDICES



## Appendix A. Program of Activities

8:00AM – 5:00PM Exhibit of brown rice

### **Seminar and Workshop Proper**

#### **Morning**

8:00-8:30 Registration

8:30-9:10 Opening Program

Invocation

National Anthem

Welcome Remarks

PAC choir

PAC choir

Eufemio T. Rasco, Jr., Ph.D.

*PhilRice Executive Director*

**Ceremonial Pounding of Rice** PhilRice, PRRM, and RWAN

9:30-9:50 AM 9:11-9:40

#### **Topic 1: Nutritional and health aspects of brown rice**

Speaker: Marissa V. Romero, Ph.D., *PhilRice*

Discussant: Trinidad P. Trinidad, Ph.D., *FNRI*

9:41-9:50 **Open Forum**

9:51-10:20

#### **Topic 2: Implications of brown rice to rice self-sufficiency**

Speaker: Sergio R. Francisco, Ph.D., *PhilRice*

Discussant: Jaime Tadeo, *National Rice Farmers' Council*

10:21-10:30 **Open Forum**

10:31-11:00

#### **Topic 3: Ways to improve acceptability of brown rice to consumers**

Speaker: Mr. Henry M. Corpuz, *PhilRice*

Discussant: Mr. Isidro Villaflor, *Private Sector*

11:01-11:10 **Open Forum**

11:11-11:40

#### **Topic 4: Strategies to increase the availability of brown rice in the market**

Speaker: Mr. Henry Lim Bon Liong, *SL Agritech*

Discussant: Isabelita M. Pabuayon, Ph.D, *UPLB*

11:41-11:50 **Open Forum**

11:51 – 1:30 **LUNCH**

**Afternoon**

1:30 – 2:00

**Topic 5: Social enterprise initiatives of Civil Society Organizations in the production and marketing of brown rice**

Speaker: Rene Guarin, *Former Executive Director, Upland Marketing Foundation, Inc.*

Discussant: Marlon P. Palomo, *Vice President, PRRM*

2:01 – 2:10 **Open Forum**

2:11 - 2:40 Overview of the Group Discussions  
Flordeliza H. Bordey, Ph.D., PhilRice

2:41 – 3:40 **Group Discussions**

**Group 1:** Increasing the supply of brown rice in the market  
Moderator: Eulito U. Bautista, Ph.D., PhilRice

**Group 2:** Increasing public awareness and acceptability of brown rice  
Moderator: Cesar P. Mamaril, Ph.D., PhilRice

3:41 – 4:40 **Presentation of Workshop Output**

4:41-5:00 Closing Program  
Closing Remarks Manuel Jose C. Regalado, Ph.D.  
Deputy Executive Director  
for Research, PhilRice

**Awarding of tokens and certificates for presenters and discussants** PhilRice Directors, PRRM  
President, and Lead Convenor  
of R1

## Appendix B. List of Participants:

### Government

Sana, Edmund J.	DA
Juan, Jay	
Mendoza, Anabel C.	DA-RFU 3
Pelayo, Eduviges T.	DA-RFU 3
Garcia, Rosemarie G.	FNRI
Trinidad, Trinidad P.	FNRI
Alojado, Diocano D.	NFA
Jarcis, Eduardo A.	NFA
Co, Carlito G.	NFA
Garcia, Joel	NFA
Santos, Alvin	NFA
Hernandez, Jose Wes C.	OPAg-Pampanga
Pineda, Honorio R.	OPAg-Pampanga
Dela Cruz, Renita SM.	PhilMech
Malanon, Hernaiz G.	PhilMech
Villaflor, Isidro	Nueva Ecija

### Farmers

Domingo, Rodrigo C.	Pampanga
Sunglao, Enriques C.	Pampanga

### State Colleges and Universities

Adolfo, Dominic S.	AUF
Cunanan, Erika Shane P.	AUF
Tayag, Anne Loraine R.	AUF
Sangilan, Mara Lovella P.	AUF
Dispo, Ma. Patricia S.	AUF
Pabuayon, Isabelita M.	CEM-UPLB
Dela Cruz, Quirino D.	CLSU
Gajete, Tomas G.	CLSU
Calaquian, Carol R.	PAC
Galang, Krizell D.	PAC
Reyes, Jesus Elias Z.	PAC
Valasquez, Edwin DG.	PAC

### PhilRice

Esmero, Nomer C.	Agusan
Vasallo, Artemio B.	Bicol
Martin, Edwin C.	CPD
Angeles, Amelita T.	CPD
Esmero, Diadem G.	DevComm

Eligio, Anne Marie Jennifer E.	DevComm
Lanuza, Andrei B.	DevComm
Tamani, Luis Alejandro I.	ISD
Narvadez, Chona Mae S.	IGO
Malabanan, Necitas B.	IGO
Tolentino, Aileen	IGO
Bongat, Fidela P.	Isabela
Juliano, Bienvenido O.	Los Baños
Mamaril, Cesar P.	Los Baños
Tuaño, Arvin Paul P.	Los Baños
Baradas, Airene Claire M.	Los Baños
Suñer, Albert Christian S.	Negros
Capistrano, Ailon Oliver V.	Negros
Regalado, Manueal Jose C.	OEDDR
Lanuza, Mary Grace V.	OEDDR
Rasco, Eufemio T. Jr.	OED
Briones, Constante T.	OED
Lozano, Marc Elvin T.	OPAPA
Romero, Marissa V.	RCFSD
Corpuz, Henry M.	RCFSD
Bandonill, Evelyn H.	RCFSD
Bergonio, King B.	RCFSD
Ramos, Riza A.	RCFSD
Gagelonia, Eden C.	REM
Bautista, Eulito U.	REM
Valdez, Harvey V.	REM
Abadilla, Celia G.	TMS
Ilar, Glenn Y.	TMS
Gergon, Evelyn	ASPPD
Francisco, Sergio R.	SED
Mataia, Alice B.	SED
Tanzo, Irene R.	SED
Beltran, Jesusa C.	SED
Malasa, Ronell B.	SED
Manalili, Rowena G.	SED
Redondo, Guadalupe O.	SED
Relado, Rhemilyn Z.	SED
Bordey, Flordeliza H.	SED
Litonjua, Aileen C.	SED
Lamson, Florencio B.	SED
Tolentino, Charis Mae A.	SED
Paran, Suennie Jane C.	SED
Bulanhagui, Maricel G.	SED
Avila, Karen B.	SED

## Non-Government Organizations

Paule, Carmen M.	Asia Rice Foundation
Arucan, Crispin E.	Gratia Plena
Rafael, Feliciano	Gratia Plena
Castro, Juanito	Gratia Plena
Paras, Llyod B.	League of Municipalities in the Philippines
Tadeo, Jaime	National Rice Farmers Council
Gloria, Joseph	PRRM-Main
Manangan, Nilo	PRRM-Main
Saño, Bill	PRRM-Main
Guarin, Rene	Upland Marketing Foundation, Inc.
Tanchuling, Hazel	RWAN

## Private

Lim Bon Liong, Henry	SL Agritech
Lim, Brian O.	SL Agritech
Cendana, Emmanuel V.	SL Agritech
De Castro, Amador M. Jr.	SL Agritech
Malabanan, Frisco	SL Agritech
Entia, Maryfel	SL Agritech
Palomo, Joselito	SL Agritech
Padigos, P.	SL Agritech
Senarpida, Ryan	SL Agritech
Reyes, Arturo L.	Jollibee Group of Companies
Sarmiento, Rodrigo D.	Jollibee Group of Companies

### **Appendix C. Policy Research and Advocacy Team:**

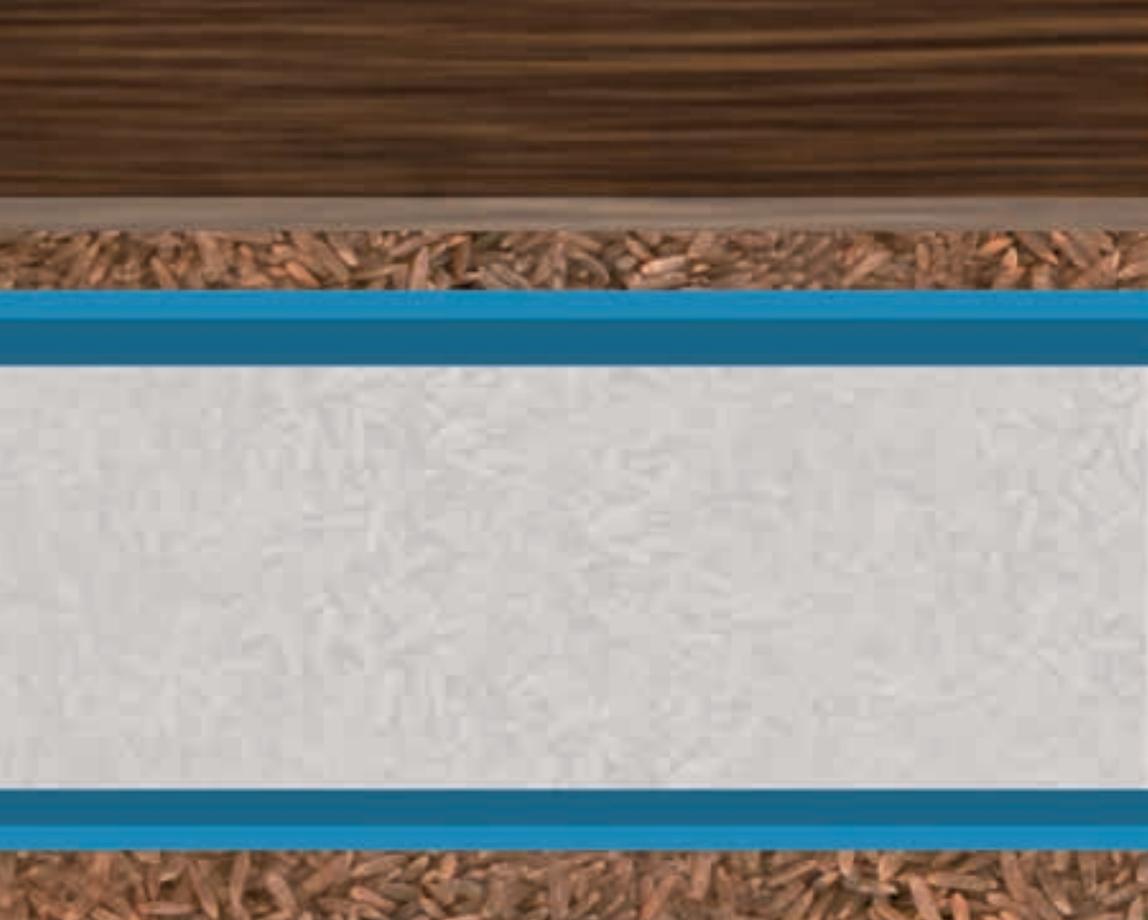
Flordeliza H. Bordey, Ph.D.  
Aileen C. Litonjua  
Florencio B. Lamson  
Suennie Jane C. Paran  
Charis Mae A. Tolentino  
Karen B. Avila  
Maricel G. Bulanhagui

### **Appendix D. Editorial Team**

Aileen C. Litonjua  
Charis Mae A. Tolentino  
Suennie Jane C. Paran  
Florencio B. Lamson  
Karen B. Avila  
Maricel G. Bulanhagui  
Shereen P. Razon







**Sponsored by**

Philippine Rice Research Institute (PhilRice)

Philippine Rural Reconstruction Movement (PRRM)

and the

Rice Watch and Action Network (R1)