



# Whole Grains Consumption in the Philippines

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# Department of Science and Technology - Food and Nutrition Research Institute



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# The DOST-Food and Nutrition Research Institute has 3D Mandates

Executive Order 128 Section 22:



**D**efine the citizenry's nutritional status, with reference to the malnutrition problem, its causes and effects



**D**evelop and recommend evidence-based policy options, strategies, program models and projects



**D**iffuse knowledge and technologies in food and nutrition and provide S&T services to stakeholders (as per E.O. 366, November 13, 2009)



# Definition of a whole grain & whole grain food

- ✓ an entire grain kernel, meaning that **all edible elements**—the germ, the endosperm, and the bran—are present and intact in the food
- ✓ a whole-grain food shall contain at least 50% whole-grain ingredients based on dry weight
- ✓ contain **all the essential parts and naturally-occurring nutrients of the entire grain seed** in their original proportions



If the grain has been processed, the food product should deliver the same rich balance of nutrients that are found in the original grain seed

Source:

<https://www.fda.gov/regulatory-information/search-fda-guidance-documents/draft-guidance-industry-and-fda-staff-whole-grain-label-statements>

<https://wholegrainscouncil.org/definition-whole-grain>

[https://www.wholegraininitiative.org/media/attachments/2021/05/18/whole-grain-food-definition\\_v-2020-11-8\\_incladdininfo.pdf](https://www.wholegraininitiative.org/media/attachments/2021/05/18/whole-grain-food-definition_v-2020-11-8_incladdininfo.pdf)

# What is a WHOLE GRAIN?

ALL parts of the whole grain - the bran, endosperm and germ - must be present to qualify as a whole grain.

## bran

The bran is the multi-layered outer skin of the edible kernel. It contains important antioxidants, B vitamins and fiber.



## endosperm

The endosperm is the largest part of the kernel and is the germ's food supply, which provides essential energy to the young plant. It contains starchy carbohydrates, proteins and small amounts of vitamins and minerals.

## germ

The germ is the embryo which has the potential to sprout into a new plant. It contains many B vitamins, some protein, minerals, and healthy fats.





# Examples of Whole Grains and Whole Grain Products

## Brown Rice and Pigmented Rice



## Corn and Other Corn Products



## Oats/Oatmeal & Products



## Other Whole Grains



## Breakfast Cereals



## Other Whole Grain Products



*Note: Pigmented rice – undermilled red, black, purple rice*

*Other corn products – whole corn kernel in can, hominy (binatog), popcorn (all flavors), etc.*

*Other whole grains – sorghum, millet, adlai, amaranth, quinoa*

*Other whole grain products – whole grain bread, whole grain pasta, whole meal biscuits/crackers, etc.*



# Status of regulations related to whole grains



# Whole grain related recommendations and health claims in the Philippines

|  | Yes | No |
|--|-----|----|
| Are there existing regulations related to the definition of whole grain and whole grain food |     | ✓  |
| Do the regulations include requirements for minimum amounts of whole grains in various foods |     | ✓  |
| Are there labeling requirements or options for whole grains and wholegrain foods?            |     | ✓  |
| Do the regulations allow content claims related to whole grains?                             |     | ✓  |
| Do the regulations allow any health claims related to whole grains                           |     | ✓  |

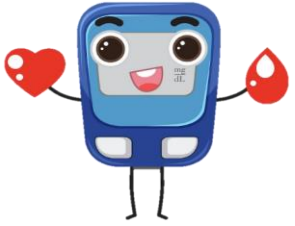


Currently the **Philippines**, has  
**No available definitions, labeling  
requirements, and health claims for  
whole grains.**





# Health Benefits of Whole Grains



**Maintains a steady blood sugar**



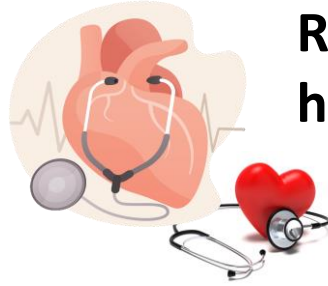
**Helps prevent formation of blood clots**



**Acts as an antioxidant**



**Helps reduce/lower cholesterol**



**Reduces the risk of heart diseases**



**Helps in digestion**



**Advances weight loss**



**Reduces the risk of Diabetes**



**Helps protect/ fight cancer**

Source:

<https://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/whole-grains/>

<https://www.philrice.gov.ph/wp-content/uploads/2016/04/RS4DMv2n3-Pushing-for-brown-rice-consumption-among-low-and-middle-income-families.pdf>

<https://www.nnc.gov.ph/regional-offices/mindanao/region-ix-zamboanga-peninsula/9112-reasons-why-you-need-to-include-red-rice-in-your-regular-diet>

<https://www.nnc.gov.ph/regional-offices/visayas/region-vii-central-visayas/6618-let-s-eat-some-black-rice>

# Promotions/ Messages related to Whole grains and products





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## DOH PROMOTES HEALTHY DIET AMONG FILIPINOS

The Department of Health (DOH), thru the National Nutrition Council, leads the nation in celebrating the 43rd Nutrition month with this year's theme, "Healthy diet, gawing habit – FOR LIFE!"

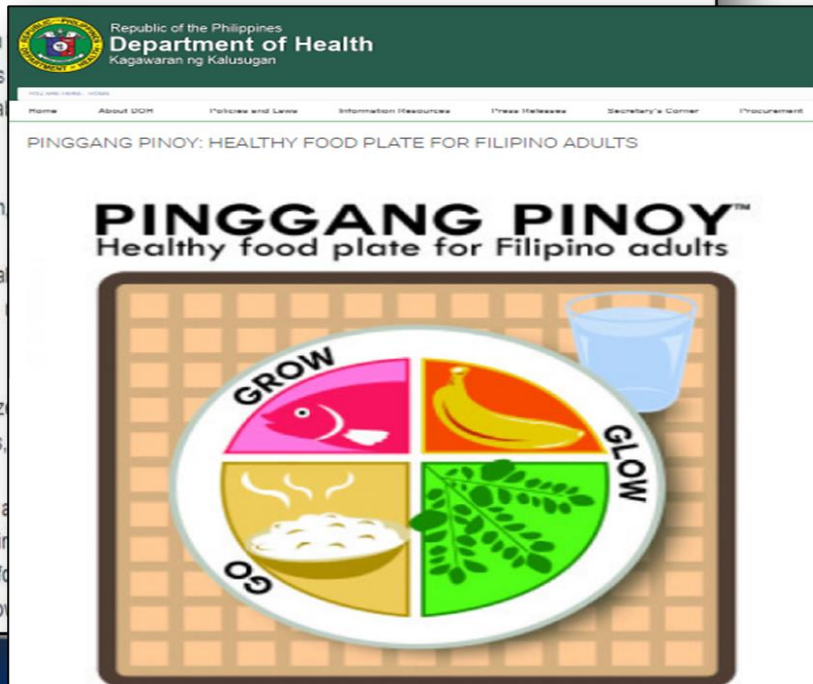
Nutrition Month is an annual campaign held every July to create greater awareness on celebration has been institutionalized by schools and local government units as well as healthy diets which protects against both under- and overnutrition and non-communicable certain types of cancer.

A healthy diet encompasses a wide range of benefits, with positive impacts on nutrition

According to the Food and Agriculture Organization (FAO) of the United Nations, a healthy individual needs for calories and nutrients; c. is safe, with no risk from toxins, bacteria, sufficient each day and all year round.

Moreover, according to the World Health Organization (WHO), a healthy diet emphasizes lean meats, poultry, fish, egg, beans and nuts. It is also low in saturated fats, trans fats,

A healthy diet, which is part of a healthy lifestyle, is the foundation of good health. It is a growth and development, daily activities and maintenance of health, keeping well within food consumed by a person. It also provides just enough amounts of energy needed for healthy body weight. Energy requirements differ from person to person and energy pro



The Department of Health (DOH) promotes a healthy diet among Filipinos and encourages them to have a healthy diet that **emphasizes regular intake of whole grains**. They also promote the *Pinggang Pinoy* as it also **encourages the intake of whole grains**.



# PINGGANG PINOY<sup>®</sup>

Healthy food plate for Filipinos

The Food and Nutrition Research Institute (FNRI) of the Department of Science and Technology (DOST) developed *Pinggang Pinoy* in collaboration with the World Health Organization (WHO), the Department of Health (DOH), and National Nutrition Council (NNC).



**GO**  
ENERGY GIVING

Go for rice, whole grains, and vegetables.

**Choose** whole grains like brown rice, corn, whole wheat bread, and oatmeal, which contain more fiber and nutrients than refined grains and are linked to lower risk of heart disease, diabetes, and other health problems.

**GROW**  
BODY BUILDING

Eat fish, shellfish, lean meat, poultry, eggs, and dried beans and lentils to support growth and muscle development.

Choose enough animal-based protein in the diet like fish and mackerel 2-3 times a week to provide essential nutrients that protect against chronic diseases.

Choose milk products and other calcium-rich foods like *dilis* for strong bones and teeth.

**GO**  
BODY RECOVERY

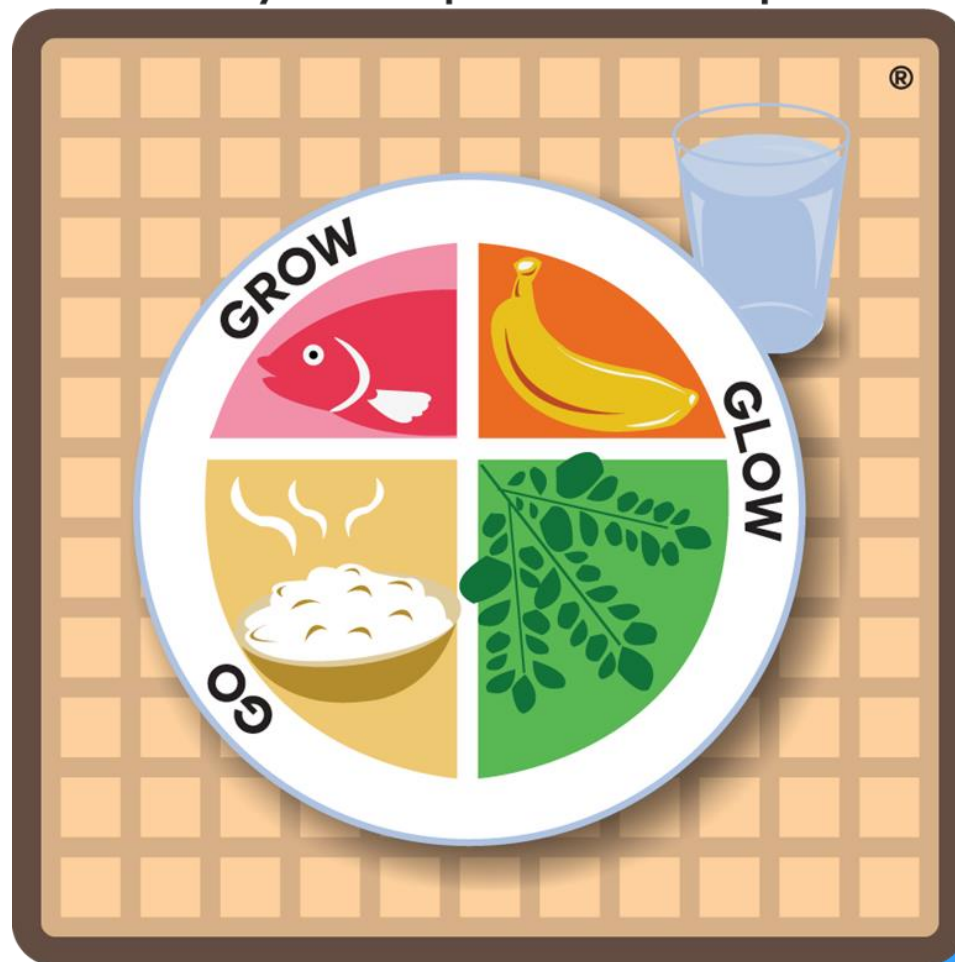
Enjoy a wide variety of fruits and vegetables, which are packed with vitamins, minerals and fiber needed for the regulation of body processes.

Take green, leafy vegetables, which have high iron and folate content to support the increased requirement for these critical nutrients.

**WATER**

Drink lots of water every day for adequate hydration.

Limit intake of sugar-sweetened beverages to reduce the risk of obesity and tooth decay.





- Choose whole grain foods over processed grain products.

Recently, concerns have been raised because of how high-fructose corn syrup is processed. Some believe that the body reacts differently to high-fructose corn syrup than it does to other types of sugar. But there is insufficient evidence to say that high-fructose corn syrup is less healthy than are other types of added sweeteners.

Research about high-fructose corn syrup is evolving. Whether high fructose corn syrup contributes more to obesity than other types of sugars or not, many of the processed foods made with the sweetener are high in calories while providing low nutritional values, according to the Mayo Clinic. The over consumption of all foods and beverages, combined with a lack of physical activity, is the most likely cause of the current rise of obesity rate.

Some research studies have linked consumption of large amounts of any type of added sugar, not just high-fructose corn syrup, to such health problems as weight gain, dental cavities, poor nutrition, and increased triglyceride levels, which can boost heart attack risk.

#### RECOMMENDATIONS ON ADDED SUGARS

A recommendation from the American Heart Association (AHA), which is not a part of the official

#### PROPER FOOD CHOICES AND HEALTH

Basic principles in knowing what to eat:

- Eat lots of vegetable and fruits. Try picking for the rainbow of colors available to maximize variety.
- Choose whole grain foods over processed grain products.
- Include dried beans and lentils in your meals.
- Include fish in your meal 2 – 3 times a week.
- Choose lean meats. Remove the skin from poultry.
- Choose non-fat dairy such as non-fat milk, yogurt, and cheese.
- Choose water and caloric-free drinks instead of regular soda, fruit drinks, sweet tea and sugar-sweetened drinks.

- Snack on vegetables, fruit, low-fat cheese, whole-grain crackers, and low-fat, low-calorie yogurt instead of candy, pastries, and cookies.

#### Carbs and some micronutrient needs

- Snack on vegetables, fruit, low-fat cheese, whole-grain crackers, and low-fat, low-calorie yogurt instead of candy, pastries, and cookies.

#### development of lung cancer, emphysema and chronic bronchitis.

More than half of the 10 leading causes of mortality in the country can be related to smoking. The dangers of smoking to health and its effect on nutritional status are well established. Controlling smoking is a key element in preventing CVD and other associated diseases. Smoking also decreases the appetite thus increasing the risk of malnutrition. It is also known to increase requirements for nutrients such as vitamin C.

Smokers posed the same health risk among the people around them through second-hand or

The **Nutritional Guidelines for Filipinos (NGF)** is a set of dietary guidelines based on the eating patterns, lifestyle, and health status of Filipinos. The NGF contains all the nutrition messages to healthy living for all age groups from infants to adults, pregnant and lactating women, and the elderly.



# World Health Organization

Representative Office  
for the Philippines

## LEGUMES AND WHOLE GRAINS



- ✓ Eat legumes such as lentils and beans and whole grains such as unprocessed maize, millet, oats, wheat and brown rice

# HEALTHY DIET FOR ADULTS



The exact make-up of a diversified, balanced and healthy diet will vary depending on individual needs, cultural context, locally available foods and dietary customs. But basic principles of what constitute a healthy diet remain the same.

## FRUITS AND VEGETABLES



- ✓ Eat at least 400g or 5 servings per day
- ✗ Potatoes, sweet potatoes, cassava and other starchy roots are not classified as fruits or vegetables

## LEGUMES AND WHOLE GRAINS



- ✓ Eat legumes such as lentils and beans and whole grains such as unprocessed maize, millet, oats, wheat and brown rice

## FATS



- ✓ Eat less than 30% of total energy intake from fats
- ✓ Unsaturated fats (fish, avocado, nut) are preferable
- ✗ Reduce consumption of saturated fats (butter, palm and coconut oil, cheese) and trans fats (processed food, fast food, margarines)

## SUGARS



- ✗ Limit free sugars intake to less than 10% of total energy intake, equivalent to 50g or around 12 teaspoons per day

## SALT



- ✗ Limit salt consumption to less than 5g of salt or 1 teaspoon per day
- ✓ Use iodized salt



# Initiatives or Projects for Whole Grains in the Philippines

## Be RiCEP*ONSIBLE*

It is a campaign of the **Department of Agriculture (DA)** encourages the public to **Be RiCEP*ONSIBLE*** by not wasting rice, eating brown rice and rice mixed with other staples and supporting locally-produced rice.





# Initiatives or Projects for Whole Grains in the Philippines

As part of the Be Riceponsible advocacy, rice consumers must start the “A BA KA DA” movement.

Be RiCEP*ONSIBLE*



Adlay, mais,  
saba, atbp. ay  
ihalo sa kanin



Brown  
rice ay  
kainin



Kanin ay  
huwag  
sayangin



Dapat bigas  
ng Pilipinas  
ang bilhin

# Product Innovation





# FNRI Technologies



## Brown Rice Nutty-Fruity Bar®

### THE BURDEN

In the Philippines, micronutrient deficiencies remain as one of the leading nutritional problems. Moreover, overweight and obesity are prevalent in the country affecting significant number of children, adolescents and adults (Expanded National Nutrition Survey 2018) which predispose them to certain nutrition and health risks.

### SOLUTION

Brown rice is a whole grain dehulled or unpolished rice. It has a mild, nutty flavor, chewier and more nutritious than white rice. Science-based evidence shows that brown rice has higher dietary fiber content, lower glycemic index and higher satiety value than well-polished rice which may help reduce the risk factors associated with constipation, hypertension, diabetes and colorectal cancer. Brown rice can be used as ingredient in various products.

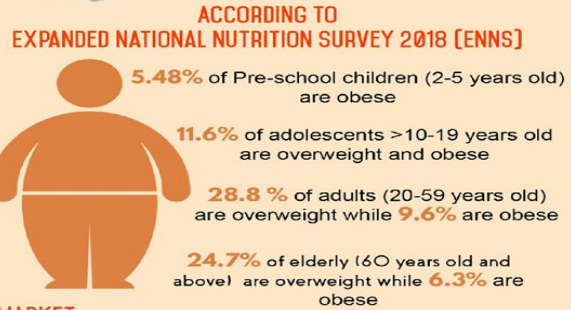
### OUR PRODUCT

As a potential functional food product, Brown Rice Nutty Fruity Bar® is a source of energy and dietary fiber and a good source of vitamins and minerals. Extruded brown rice puffs are combined with selected dried fruits, seeds and nuts and added with honey as an all-natural binder and sweetener. The extruded brown rice puffs and dried fruits are sources of fiber. Nuts, dried fruits, and seeds provide energy, vitamins and minerals. A 25 g bar contains:

|                                       |                              |
|---------------------------------------|------------------------------|
| <b>vitamins</b>                       | <b>minerals</b>              |
| 180 µg niacin <b>B<sub>3</sub></b>    | <b>K</b> 61.0 mg phosphorus  |
| 120 µg tocopherol <b>E</b>            | <b>Mg</b> 23.63 mg magnesium |
| 70 µg thiamine <b>B<sub>1</sub></b>   | <b>Ca</b> 5.75 mg calcium    |
| 70 µg riboflavin <b>B<sub>2</sub></b> | <b>Se</b> 0.53 mg selenium   |
| <b>Fat</b> 3.55 g                     | <b>Energy</b> 109 kcal       |
| <b>Protein</b> 2.63 g                 |                              |

### COMPETITIVE ADVANTAGE

Healthy snacking is now made convenient with the Brown Rice Nutty-Fruity Bar®. This snack not only provides vitamins and minerals but also doses of energy which makes it a good food for calamities. Unlike most cereal and energy bars in the market, Brown Rice Nutty-Fruity Bar® does not contain high fructose corn syrup, a common sweetener linked to obesity and other health related diseases. This bar is a healthier snackfood alternative for those who are diabetic and/or weight-watchers.



### MARKET

#### Retail

People who are health-conscious or weight-watchers, students and office workers who want healthy snack options.

#### Commercial

Establishments and institutions who want to provide their customers and stakeholders a healthy snack alternative.

#### Institutional

Private and government agencies who need to provide a food item that is healthy and convenient during feeding programs, in calamity situations or as part of army ration.

### Contact us!

Department of Science and Technology  
Food and Nutrition Research Institute

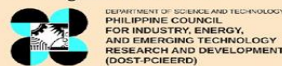
(02) 837-2071 to 82 local 2300

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dost.fnri.tdstsd@gmail.com

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Printing assistance from:



## Stabilized Brown Rice

These brown rice products were formulated to address nutritional problems prevalent in the country.

Department of Science and Technology  
**FOOD AND NUTRITION RESEARCH INSTITUTE**





DOST-FNRI received a **Bronze Prize Award** for the **Stabilized Brown Rice** (trademark: **Kayumanggi**) at the 2023 Seoul International Invention Fair held on November 1- 4, 2023 in Seoul, South Korea.

DEPARTMENT OF SCIENCE AND TECHNOLOGY  
FOOD AND NUTRITION RESEARCH INSTITUTE



## Stabilized Brown Rice

**Nutrition Status**  
Physiologic risk factors such as elevated Fasting Blood Glucose (FBG) and blood pressure, dyslipidemia, and obesity are important in assessing an individual's risk in developing non-communicable diseases (NCDs). Risk factors of non-communicable diseases are high sugar and salt, coupled with sedentary lifestyle.

**Solution**  
Brown rice is more nutritious than white rice. It has a low glycemic index. It is also a good source of fiber, vitamins, and minerals. The simple heat treatment technology used in this rice can last 9 months without spoiling and without losing its nutrients.

**Our Product**  
Stabilized Brown Rice is a shelf-stable rice that can last 9 months without spoiling. It is a simple heat treatment technology that can last 9 months without spoiling untreated brown rice.

| Quality Parameters    | FNRI Stabilized Brown Rice |
|-----------------------|----------------------------|
| Shelf-life            | 4-9 months*                |
| Ease of cooking       | Yes                        |
| Minerals & B-vitamins | retained                   |
| Dietary fiber         | retained                   |
| Texture               | acceptable                 |
| Glycemic index        | Low-moderate               |

\*depending on the rice variety

**Contact Us**  
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Department of Science and Technology  
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dost.fnri.tdstsd@gmail.com  
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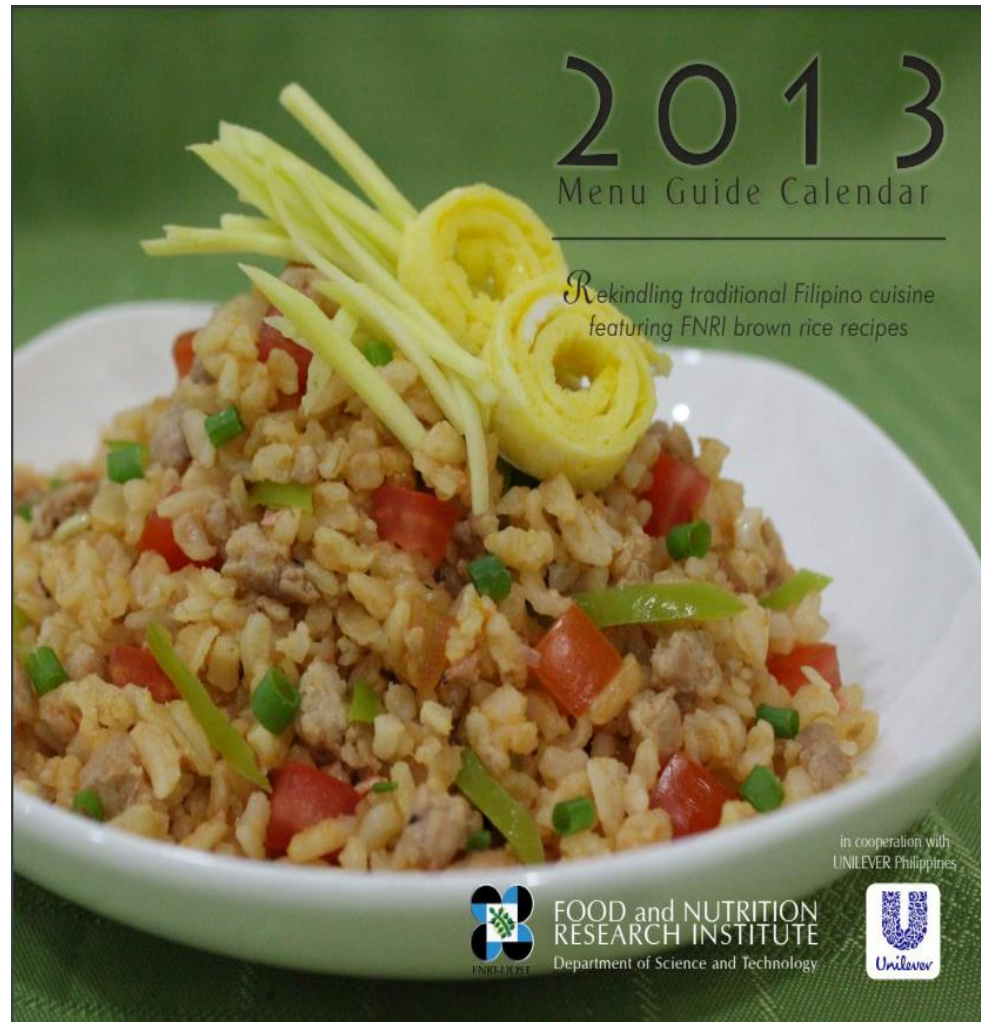
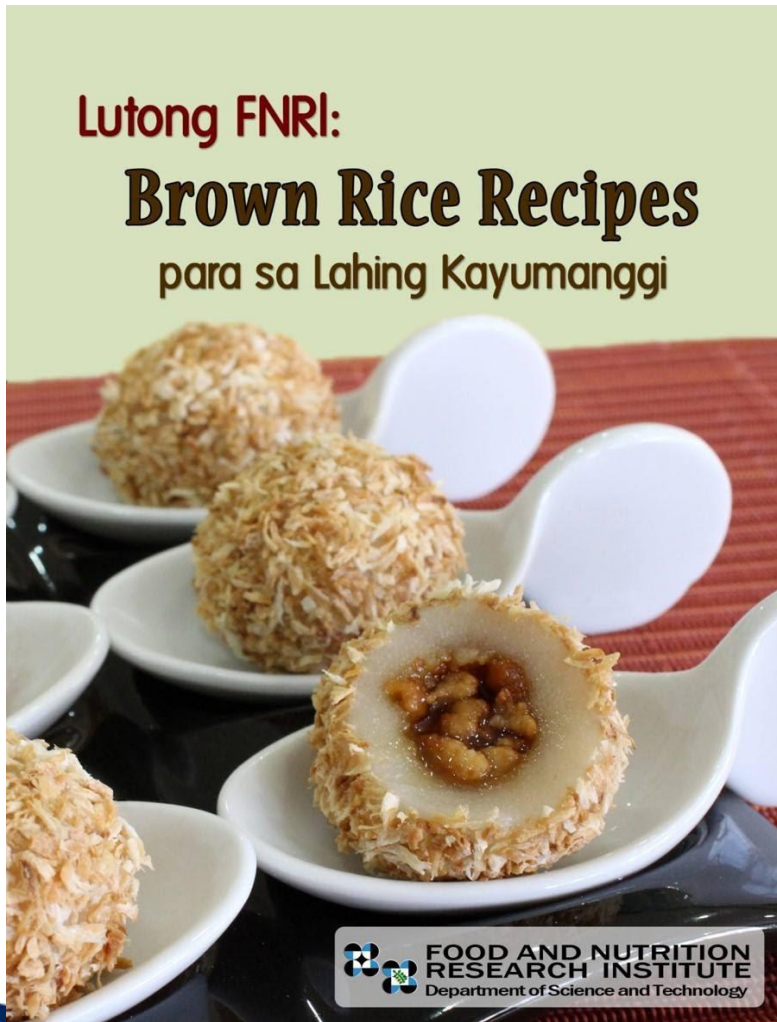


SEUL INTERNATIONAL INVENTION FAIR  
**Bronze Prize**  
Presented to  
Rosemarie G. Garcia / Dahlia A. Diaz / Alex M. Palomo / Razoland B. Navarro / May Rose Ladia  
from  
Philippines  
for excellent efforts in creating invention(s)  
Stabilized Brown Rice  
exhibited at the SIFF 2023, Seoul Korea  
"2023 Seoul International Invention Fair"  
1st - 4th of November, 2023  
한국발명진흥회  
KOREA INVENTION PROMOTION ASSOCIATION





# FNRI Developed Recipes



FNRI developed recipes highlighting on brown rice to promote the health benefits of brown rice.

This could help everyone to prepare, eat and enjoy brown rice in various dishes.





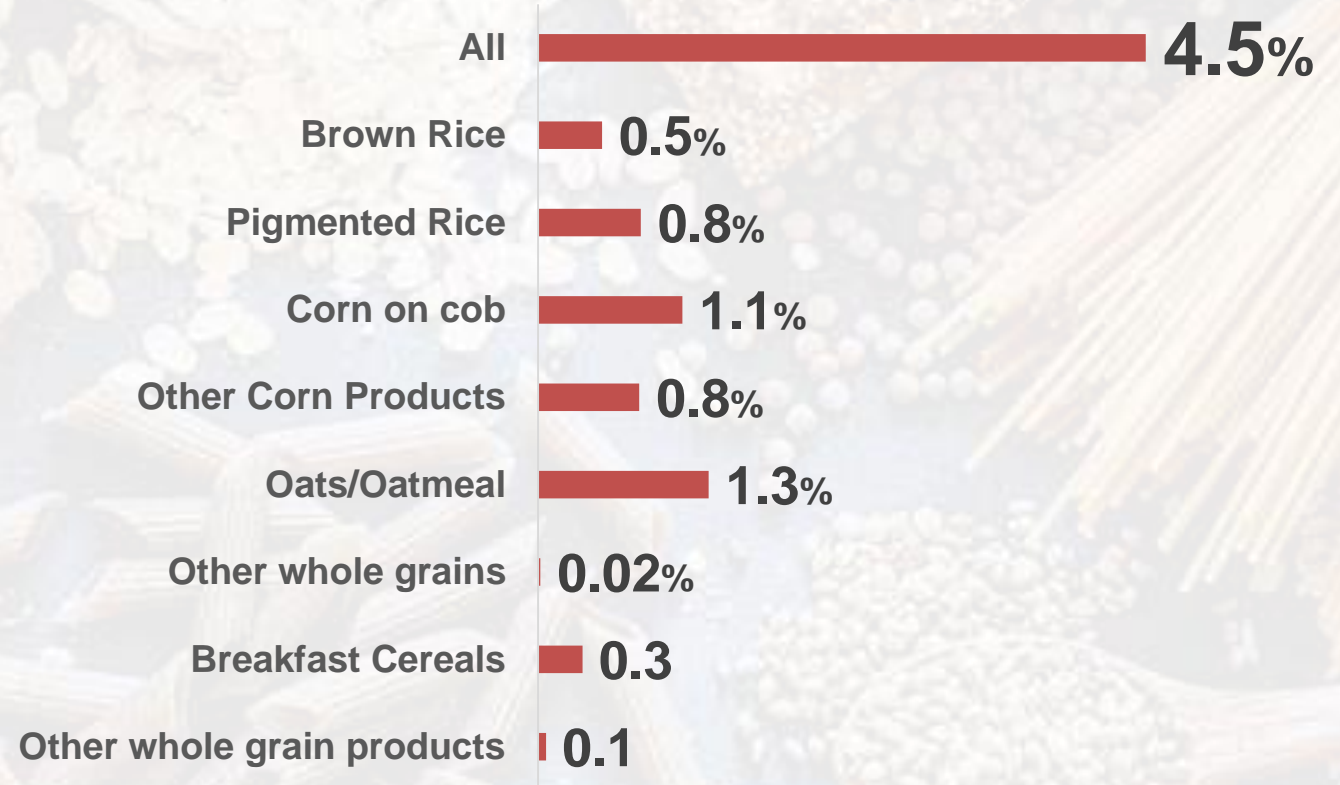
# What does our National Nutrition Survey data say?



# Percentage of households consuming Whole grains and products: Philippines, 2018-2021

1 out of 22

Filipino households  
consumed Whole grains



Note: Pigmented rice – undermilled red, black, purple rice

Other corn products – whole corn kernel, hominy (binatog), popcorn (all flavors), etc.

Other whole grains – sorghum, millet, amaranth, quinoa

Other whole grain products – whole grain bread, whole grain pasta, whole meal biscuits/crackers, etc.

# Mean one-day per capita intake and percentage of household consuming whole grains and products: Philippines, 2018-2019

## Corn on the cob



46.3 g,  
36.5%

## Pigmented Rice



40.6 g,  
32.0%

## Brown Rice



23.4 g,  
18.5%

## Oats/Oatmeal & Products



9.8 g,  
7.7%

## Other corn products



5.6 g,  
4.4%

## Breakfast Cereals



0.8 g,  
0.7%

## Other Whole Grains



0.2 g,  
0.2%

## Other Whole grain products





0.2 g,  
0.2%

Note: Pigmented rice – undermilled red, black, purple rice  
Other corn products – whole corn kernel, hominy (binatog), popcorn (all flavors), etc.  
Other whole grains – sorghum, millet, amaranth, quinoa  
Other whole grain products – whole grain bread, whole grain pasta, whole meal biscuits/crackers, etc.








# Percent energy contribution of whole grains to total caloric intake by place of residence; Philippines, 2018-2019

| Place of Residence   | Total Calorie Intake (kcal) | Total Calorie Intake from Whole grain (kcal) | % Energy Contribution |
|--|-----------------------------|--|-----------------------|
| <br><b>Urban</b>  | <b>1860</b>                 | <b>190</b>                                   | <b>10.3%</b>          |
| <br><b>Rural</b> | <b>1900</b>                 | <b>440</b>                                   | <b>23.0%*</b>         |

\*significant at  $p < 0.05$

# Percent energy contribution of whole grains to total caloric intake by wealth quintile; Philippines, 2018-2019

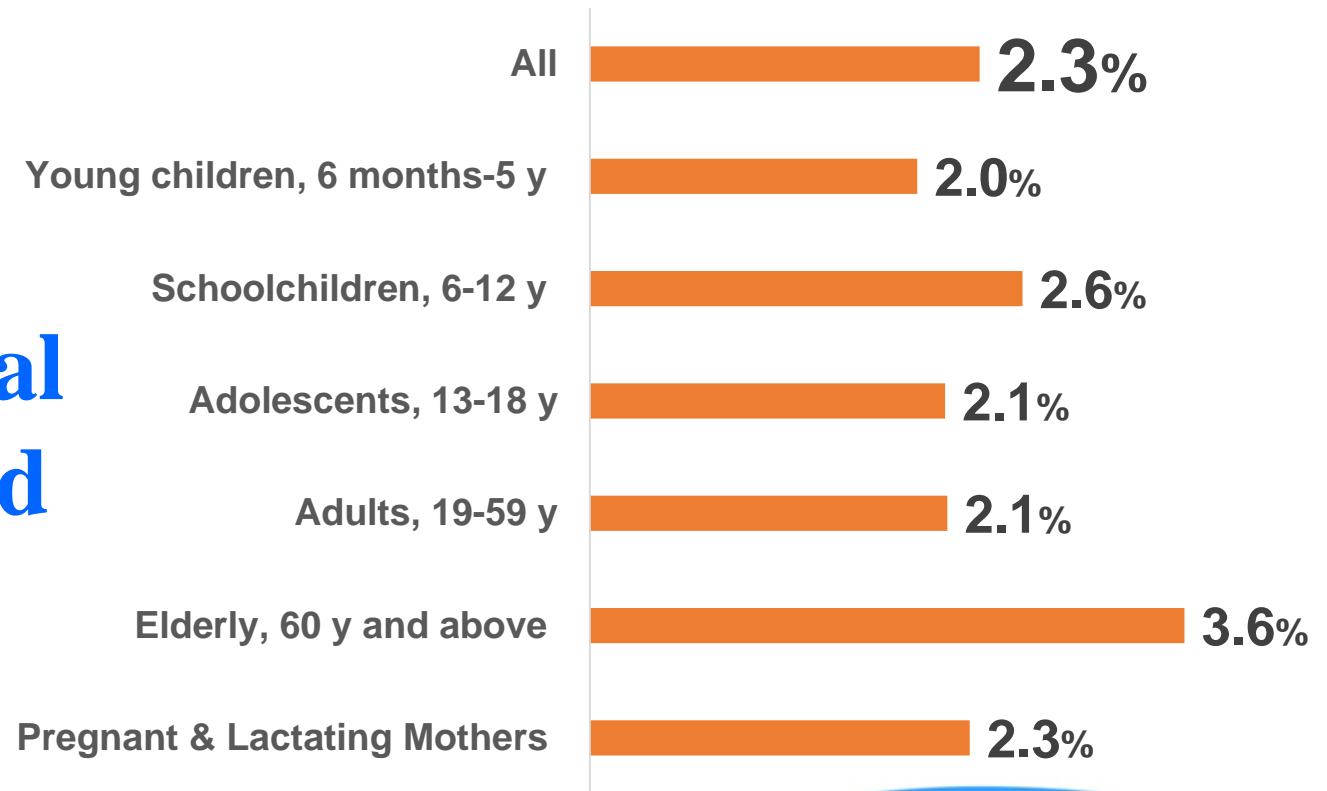
| Wealth Quintile  | Total Calorie Intake (kcal) | Total Calorie Intake from Whole Grain (kcal) | % Energy Contribution |
|--|-----------------------------|--|-----------------------|
|  <b>Poorest</b>   | <b>1930</b>                 | <b>700</b>                                   | <b>36.5%</b>          |
|  <b>Poor</b>      | <b>1870</b>                 | <b>390</b>                                   | <b>20.8%</b>          |
|  <b>Middle</b>    | <b>1770</b>                 | <b>260</b>                                   | <b>14.8%</b>          |
|  <b>Rich</b>    | <b>1870</b>                 | <b>220</b>                                   | <b>12.0%</b>          |
|  <b>Richest</b> | <b>1940</b>                 | <b>220</b>                                   | <b>11.6%</b>          |

# Percent consuming of whole grains by population group: Philippines, 2018-2021







1 out of 50



**Filipino  
Individual  
consumed  
whole  
grains**



# Intake of whole grains per day by age group, Philippines 2018-2021

| Age Groups   | Mean Intake (g) | % Consuming | % Energy Contribution | Most Commonly Consumed Whole Grains   |
|--|-----------------|-------------|-----------------------|---|
| <br>Young children,<br>6 months-5 y | <b>48 g</b>     | <b>2.0%</b> | <b>15.6%</b>          | Corn, Breakfast Cereals, Other Corn Products<br> |
| <br>Schoolchildren,<br>6-12 y       | <b>81 g</b>     | <b>2.6%</b> | <b>19.8%</b>          | Other Corn Products, Breakfast Cereals, Corn<br> |
| <br>Adolescents,<br>13-18 y       | <b>126 g</b>    | <b>2.1%</b> | <b>22.1%</b>          | Other Corn Products, Corn, Pigmented Rice<br>  |

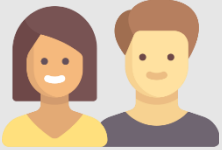





Note: Pigmented rice – undermilled red, black, purple rice

Other corn products – whole corn kernel, hominy (binatog), popcorn (all flavors), etc.

Other whole grains – sorghum, millet, amaranth, quinoa

Other whole grain products – whole grain bread, whole grain pasta, whole meal biscuits/crackers, etc.

# Intake of whole grains per day by age group, Philippines 2018-2021

| Age Groups   | Mean Intake  | % Consuming | % Energy Contribution | Most Commonly Consumed Whole Grains   |
|--|--------------|-------------|-----------------------|---|
| <br>Adults, 19-59 y                     | <b>128 g</b> | <b>2.1%</b> | <b>23.5%</b>          | Corn, Pigmented Rice, Oatmeal and oatmeal products<br>   |
| <br>Elderly,<br>60 y and above          | <b>107 g</b> | <b>3.6%</b> | <b>26.2%</b>          | Oatmeal and oatmeal products, Pigmented Rice, Corn<br>   |
| <br>Pregnant &<br>Lactating<br>Mothers | <b>127 g</b> | <b>2.3%</b> | <b>21.4%</b>          | Corn, Pigmented Rice, Oatmeal and oatmeal products<br> |

Note: Pigmented rice – undermilled red, black, purple rice  
 Other corn products – whole corn kernel, hominy (binatog), popcorn (all flavors), etc.  
 Other whole grains – sorghum, millet, amaranth, quinoa  
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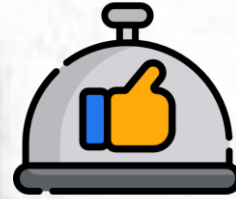
# Reasons for consuming whole grains among 3 years old and above: Philippines, 2019

Philippine Journal of Science  
151 (5): 1845-1855, October 2022  
ISSN 0031 - 7683  
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## Drivers and Barriers of Whole Grain Consumption in the Philippines: 2019 Expanded National Nutrition Survey

Imelda Angeles-Agdeppa<sup>1</sup>, Josie Platon-Desnacido<sup>1\*</sup>,  
Apple Joy D. Ducay<sup>1</sup>, Charmaine A. Duante<sup>1</sup>, and Kit Phanvijhitsiri<sup>2</sup>

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Bicutan, Taguig City, Metro Manila 1631 Philippines  
<sup>2</sup>PepsiCo Services Asia Ltd.,  
622 Emporium Tower, 17th and 22nd Floor, Sukhumvit Road,  
Klongton, Klongtoey, Bangkok 10110 Thailand



Taste good/  
delicious

56.1%



Preference/habit

25.9%



Beneficial to and  
good for health

16.0%



Convenient to eat/  
easy to prepare

11.1%

# Barriers for consuming whole grains and products among 3 years old and above: Philippines, 2019



Not easily available or accessible/ Difficult to find at the store

**60.6%**



Expensive/ Cost too much/ Not affordable

**26.5%**



Got fed up with eating whole grains

**14.0%**



Rough texture

**5.9%**



Not convenient to eat/ Difficult to swallow

**5.1%**

Angeles-Agdeppa et al.: Drivers and Barriers of Whole Grain Consumption in the Philippines. *Philippine Journal of Science*. Vol. 151 No. 5, October 2022

# Takeaway message



- ❑ There is a low proportion of consuming population in the Philippines.
- ❑ Thus, increasing the availability, affordability, and consumer awareness of the health benefits of whole grains and products can help increase the consumption across age groups.
- ❑ The lack of regulations on the minimum requirements, labeling requirements, nutrition, and health claims for whole grains and products should be addressed by nutrition professionals and policy-making bodies in the country.





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