



**Welcome  
to  
Grain Quality and  
Nutrition Division, BRRI**



# Grain Quality and Nutrition Division

## Vision

Development and Invention of technology to assess and maintain the nutritional quality of rice.

## Mission

Innovation of technology through basic and advanced rice research to achieve food and nutrition security of our country.



# Grain Quality and Nutrition Division

## Mandate

Superior quality germplasm identification by physicochemical and nutraceutical characterization to develop high yielding variety in order to boost up nutraceutical enriched rice production.



# Grain Quality and Nutrition Division

## On going research activities

- Grain Quality Characterization for Variety Development
- Nutraceutical Characterization of Rice
- Chemical analysis of rice and rice by-products
- Formulation of rice based food items.

## Modern Laboratory Equipments of GQN Division

Grain Analyzer

Seed Counter

Freeze Dryer

HPLC

Microscope

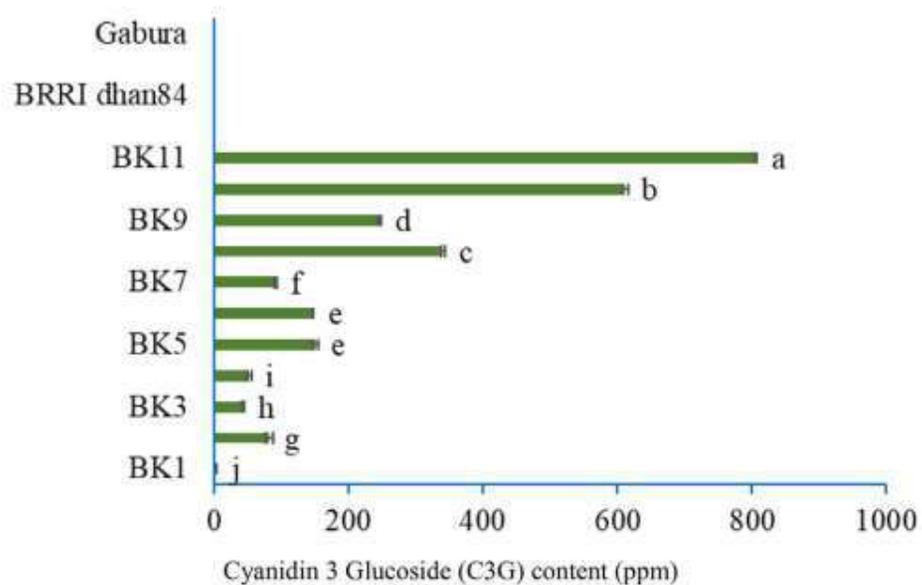
Texture Analyzer

Rice Milling System



# Research Achievements

Study on anti-oxidative and **anti-cancer** properties of **black rice** cultivars in Bangladesh



# Research Achievements

BIRRI has already categorized three (3) HYVs as Low GI indexed rice varieties ( $GI \leq 55$ ) based on in vivo experiment at GQN.

Low GI rice HYVs are **BR16 (GI 52.4)**, **BIRRI dhan46 (GI 53.1)** and **BIRRI dhan69 (GI 54.9)**.

**In vivo animal experiment at GQN, BIRRI**



# Research Achievements

Improving the **quality of rice bran** by inactivating Lipase Enzyme through physical **heat treatment**.

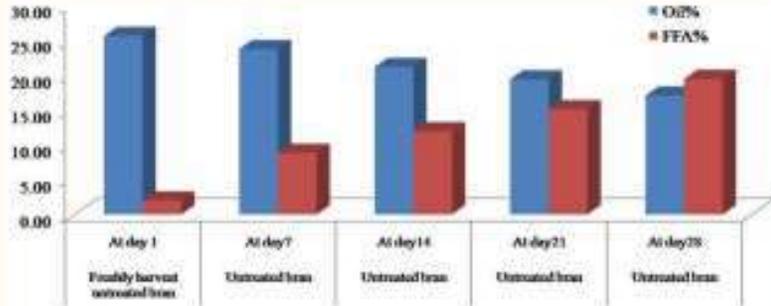


Figure 2: Untreated BIRRI dbas28 bran were used for extracting Oil content% and measuring FFAs% from freshly harvest to 28 days of storage at room temperature and parboiled milling condition.

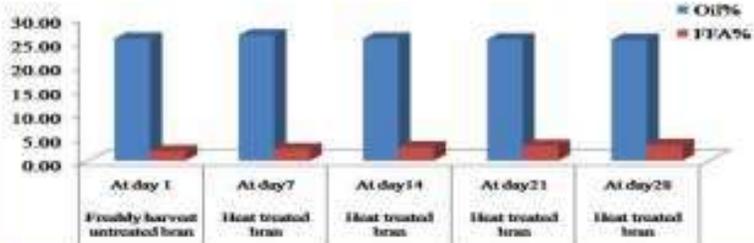


Figure 3: Heat-treated BIRRI dbas28 bran were used for extracting Oil content% and measuring FFAs% from freshly harvest to 28 days of storage at room temperature and parboiled milling condition.

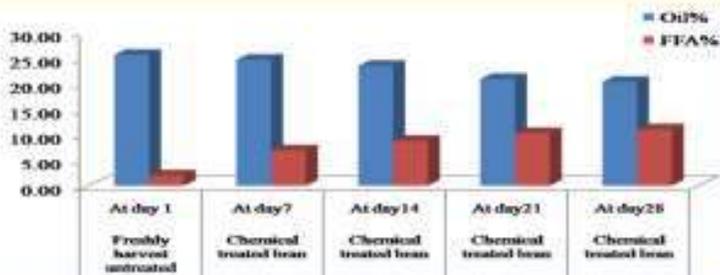
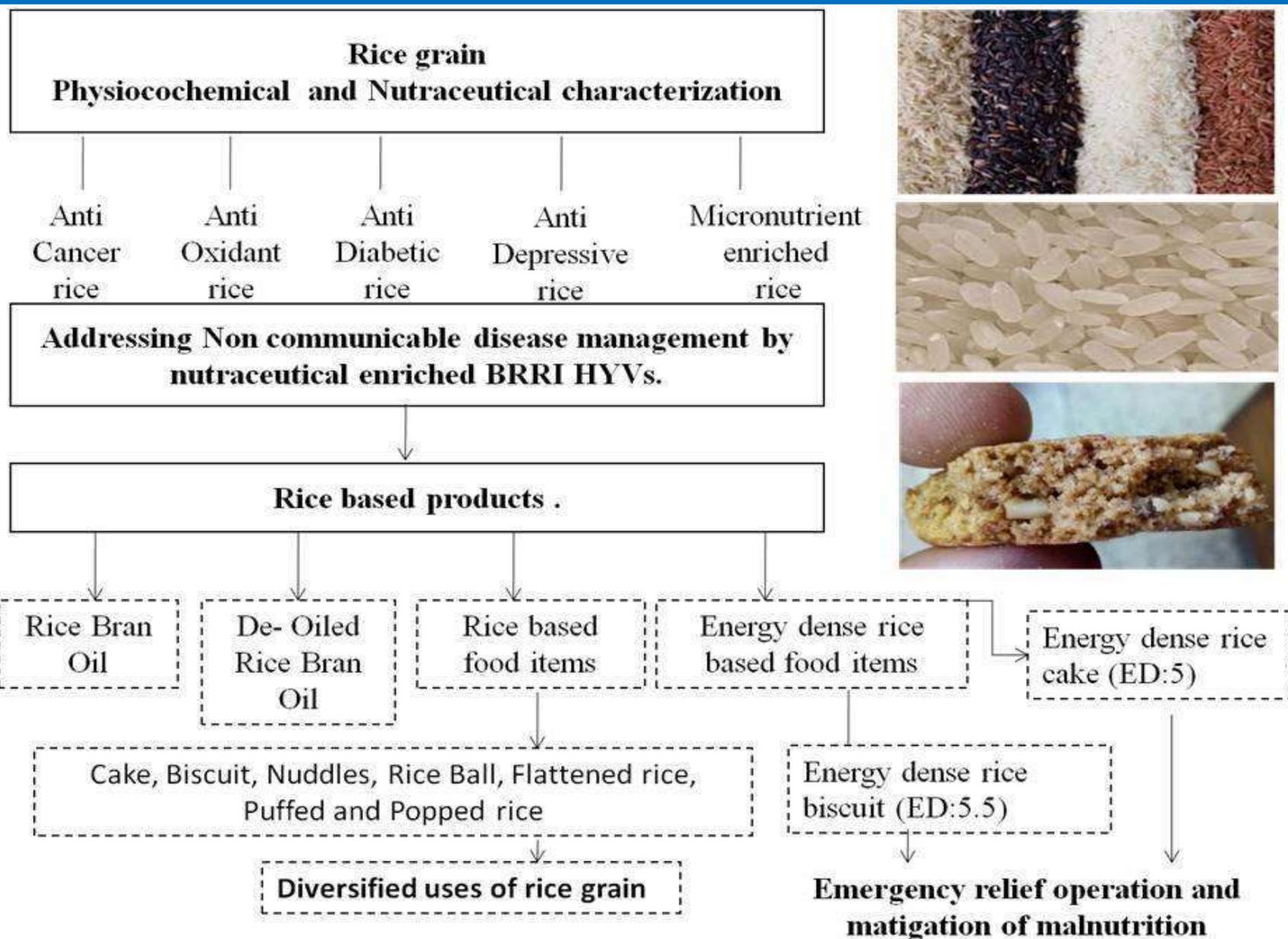


Figure 4: Chemically treated BIRRI dbas28 bran were used for extracting Oil content% and measuring FFAs% from freshly harvest to 28 days of storage at room temperature and parboiled milling condition.

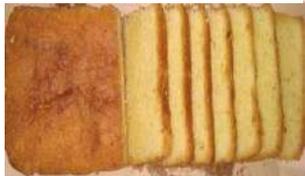
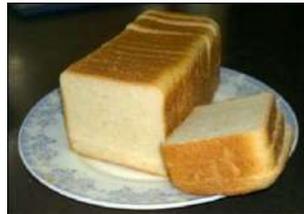


# Research Achievements



# Research Achievements

- Gluten-Free Rice-based Products Formulation (Rice Biscuits, Cake, Bread, and Noodles)



Suitable for gluten free bakery product consumption specially for children and older population

No Hypersensitive reaction due to absence of gluten protein in rice flour

# Research Achievements



Gluten Free Energy Dense  
Rice Biscuit (EDRB & Energy  
Density 5.0)

Gluten Free Energy Dense  
Rice Cake (EDRC & Energy  
Density 5.2)

Suitable for emergency relief  
operation as DRY food  
supplement during disaster  
mangement

# Formulation of Rice based low cost, Balanced, Nutritious and safe gluten free diet for the Malnourished Street children in Dhaka City

Formulation of Rice based Low cost Balanced, Nutritious and safe Diet for the Malnourished Street Children in Dhaka City



Baseline survey of dietary intake of street children

Formulation of Gluten free Energy Dense Rice

Impact study of Energy dense rice products on street

Table 1: Proximate analysis of EDRB (Energy dense rice biscuit)

Proximate components	Amount in g	Kcal/g	Estimated Kcal	Minerals	Amount /100g
Carbohydrate	57	4	228	Zn	2.50 mg
Fat	27	9	243	Fe	0.71 mg
Protein	10.6	4	42.4	Ca	3.80 mg
Dietary Fiber	1	2	2	Phos	125 mg
Ash	0.8	0	0	As	<0.1 ppm
Moisture	3.6	0	0	Pb	<0.1 ppm
Net weight	100	-	515.4	Cd	<0.1 ppm
Energy Density (ED)	5.2	-	515 Kcal	Ni	<0.1 ppm

Table 2: Proximate analysis of EDRB (Energy dense rice cake)

Proximate components	Amount in g	Kcal/g	Estimated Kcal	Minerals	Amount /100g
Carbohydrate	59	4	236	Zn	2.30 mg
Fat	25	9	225	Fe	0.51 mg
Protein	10	4	40	Ca	3.60 mg
Dietary Fiber	0.5	2	1	Phos	115 mg
Ash	0.5	0	0	As	<0.1 ppm
Moisture	5.0	0	0	Pb	<0.1 ppm
Net weight	100	-	502	Cd	<0.1 ppm
Energy Density (ED)	5.02	-	502 Kcal	Ni	<0.1 ppm



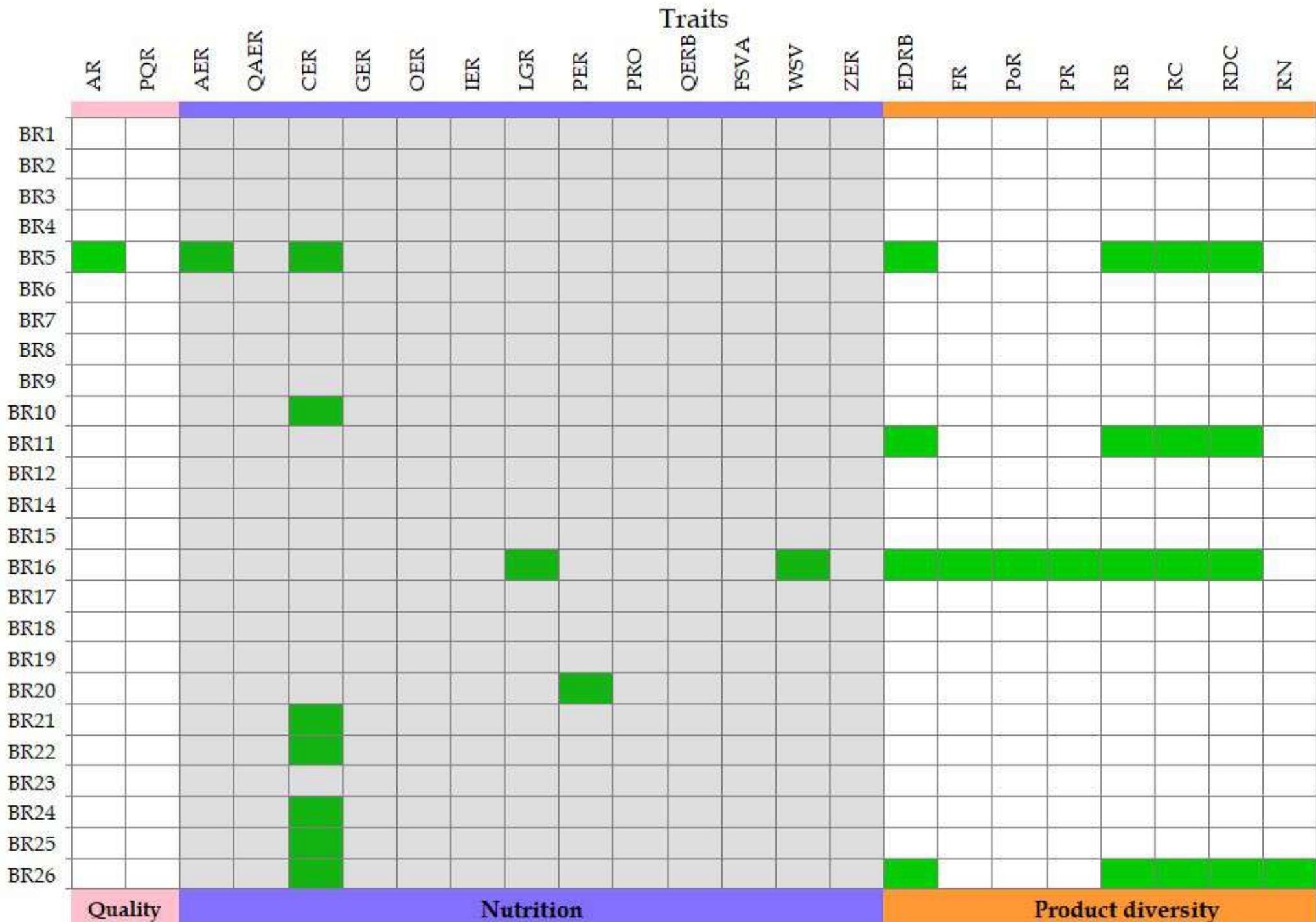
Standardization of **Gluten Free Rice** Based **Energy Dense Food Production**



## Nutritional Traits of BRRI HYVs

AR: aromatic rice; PQR: Premium quality rice; AER: Antioxidant enriched rice; QAER: Quality amino acid enriched rice; CER: Calcium enriched rice; GER: Gama amino butyric acid enriched rice; OER: Oryzanol enriched rice; IER: Iron enriched rice; LGR: Low Glycemic indexed rice; PER: Phosphorus enriched rice; PRO: Protein enriched rice; QERB: Quality enriched rice bran; FSVA: Fat soluble Vitamin-A enriched rice; WSV: Water soluble vitamin enriched rice; ZER: Zinc enriched rice; EDRB: Energy dense rice biscuit; FR: Flattened rice; PoR: Popped rice, PR: Puffed rice; RB: Rice biscuit; RC: Rice cake; RDC: Rice dry cake; RN: Rice noodles

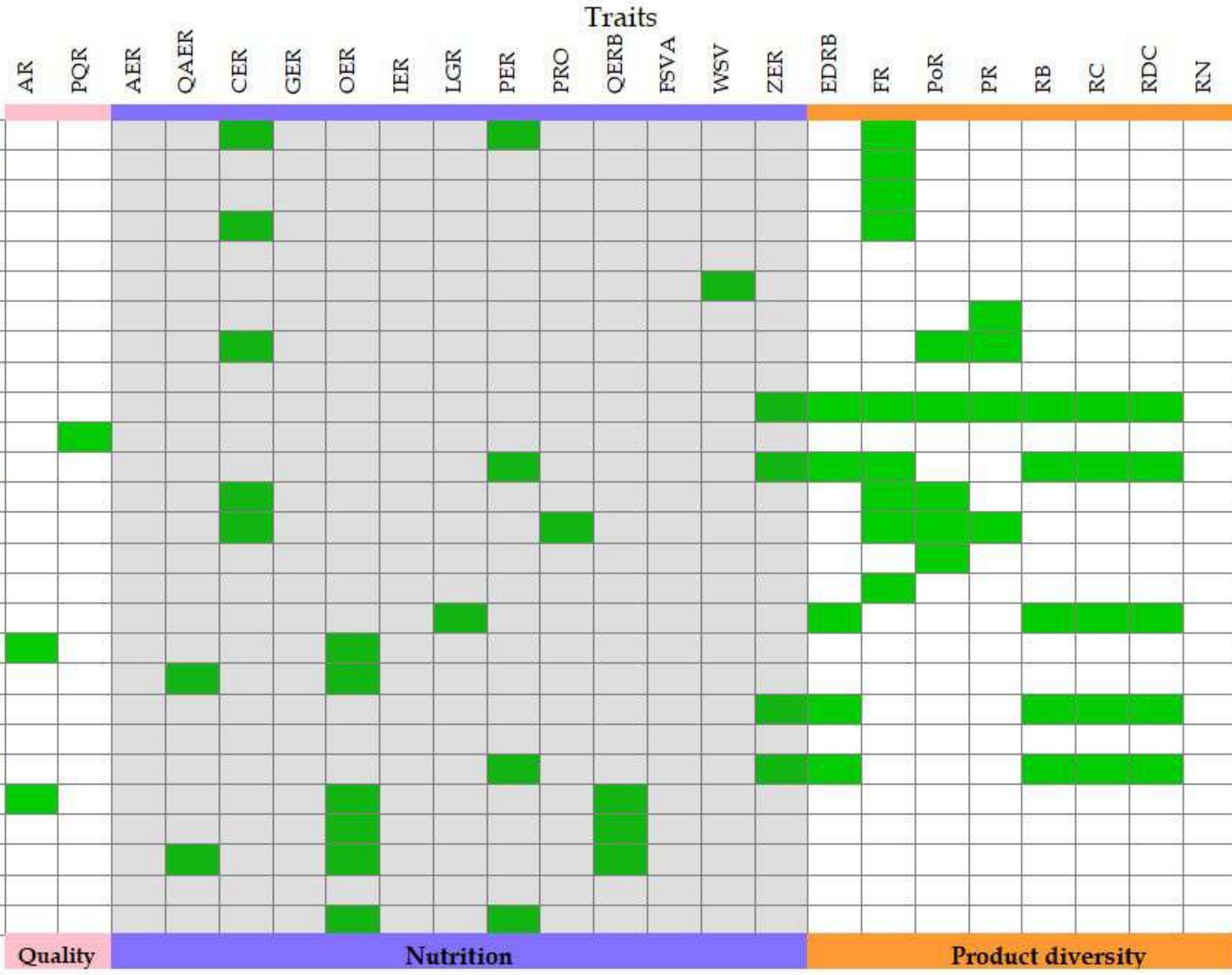
BRR1 released rice varieties



BRRRI released rice varieties



BRRRI released rice varieties







**Thank you very much for your patience hearing**