

# Ongoing Research program for 2023-2024

## Grain Quality and Nutrition Division, BRRI

Project No. and Title	Title of experiment	Name of PL, PI and CI	Objectives	Season	Location
1: Grain Quality Characteristics for Variety Development	1.1: Determination of physicochemical and cooking properties of advanced breeding lines	<b>PI:</b> MAH <b>CI:</b> SSD, NF, TKS, HBS, SH and RA	1. To help to develop data base on physicochemical, cooking and eating qualities of grain for newly developed breeding lines	All-season	GQN Lab
	1.2: Determination of physicochemical and cooking properties of TRB lines	<b>PI:</b> SSD <b>CI:</b> MAH	1. To find out the physicochemical and eating quality of promising lines for identifying better grain quality	All-season	GQN Lab
	1.3: Evaluation of physicochemical properties of newly released BRRI varieties	<b>PI:</b> SSD <b>CI:</b> HBS and MAH	1. To determine the physicochemical and cooking qualities of BRRI-developed rice varieties for updating the	All-season	GQN Lab

			database.		
<b>2: Nutritional Quality Assessment of Rice</b>	<b>2.1:</b> Analysis of ferulic acid (FA) in RBO of Bangladeshi rice varieties in the association of biochemical evaluation on burning effects of RBO in vivo rat experiment	<b>PI:</b> HBS <b>CI:</b> MAH	<ol style="list-style-type: none"> <li>1. To evaluate an appropriate analysis methodology and study the amount of FA and their relation to nutrition properties in rice.</li> <li>2. To evaluate the burning effects of RBO</li> </ol>	All-season	GQN Lab
	<b>2.2:</b> To Screening, Selection, and Training of Sensory Panelists	<b>PI:</b> SSD <b>CI:</b> MAH and Scientists (Different Division)	<ol style="list-style-type: none"> <li>1. To determine impairment of primary senses (color, vision, ageusia, and anosmia)</li> <li>2. To match test for taste and odor substances</li> <li>3. To ability to detect basic taste and</li> </ol>	All-season	GQN Lab

			<p>odor acuity</p> <p>4. To determine the ability to characterize texture</p> <p>5. To evaluate performance in comparison with other candidates</p> <p>6. To increase the sensory acuity of panelists and provide them with a rudimentary knowledge of procedures used in sensory evaluation.</p>		
	<p><b>2.3:</b> A study on the different components of rice in relation to palatability</p>	<p><b>PI:</b> NF <b>CI:</b> HBS and MAH</p>	<p>1. To identify the parameters of rice grain by comparing different components of rice samples responsible for palatability.</p>	<p>All-season</p>	<p>GQN Lab</p>

	<p><b>2.4:</b> The effect of fermentation on the nutritional and microbial changes in panta bhat</p>	<p><b>PI:</b> MAH <b>CI:</b> HBS, NF and SA (Path)</p>	<ol style="list-style-type: none"> <li>1. To evaluate the nutritional properties of panta bhat</li> <li>2. To determine the starch digestibility and bioavailability of mineral content</li> <li>3. To evaluate the microbial properties and beneficial effect of panta bhat</li> </ol>	All-season	GQN Lab
	<p><b>2.5:</b> Comparative study on rice bran oil (RBO) produced from BRRI varieties with existing RBO available in the market (Recommendation from BARC workshop-2021)</p>	<p><b>PI:</b> MAH <b>CI:</b> HBS, TKS and NF</p>	<ol style="list-style-type: none"> <li>1. To observe the chemical properties of RBO</li> <li>2. To analyze the FA profile, heavy metal and nutritional value of RBO</li> </ol>	All-season	GQN Lab
	<p><b>2.6:</b> Assessment of heavy metals (Cd, Zn, Pb, Cr, As) in soil, water, and rice grain</p>	<p><b>PI:</b> TKS <b>CI:</b> MA(Soil), BH(IWM) and MAH</p>	<ol style="list-style-type: none"> <li>1. To quantify heavy metals in soil, water, and rice grain.</li> </ol>	Boro	GQN & BCL

	from industrial area (Dhaka, Gazipur, Narayangonj, Mymensingh, Narshindi etc.)		2. To identify area of rice field contaminated by industrial effluent water.		
	<b>2.7:</b> Standardization of in vitro Glycemic Index (GI) method to evaluate GI value of rice	<b>PI:</b> MAH <b>CI:</b> NF and JF (Biotech.)	1. To standardize the in vitro GI method 2. To assess the variability of GI value through in vitro starch digestibility of physicochemically different BIRRI varieties	All-season	GQN Lab
	<b>2.8:</b> Nutraceutical characterization of newly released BIRRI HYVs.	<b>PI:</b> HBS <b>CI:</b> MRA, SH, NF, MAH, SAI (Agro) and NB (Ento)	1. Amino acid profiling of newly released BIRRI HYVs. 2. Fatty acid profiling of newly released BIRRI HYVs. 3. Antioxidant profiling of newly released BIRRI HYVs.	All-season	GQN and RA Lab

			<p>4. Mineral profiling of newly released BRRi HYVs.</p> <p>5. Volatile aromatic compound (VOC) profiling of newly released BRRi HYVs.</p>		
	<p><b>2.9:</b> Comparative study on rice bran oil (RBO) produced from BRRi varieties with existing RBO available in the market (Recommendation from BARC workshop-2022)</p>	<p><b>PI:</b> MAH <b>CI:</b> HBS, TKS and NF</p>	<p>1. To observe the chemical properties of RBO</p> <p>2. To analyze the FA profile, heavy metal and nutritional value of RBO</p>	All-season	GQN and RA Lab
	<p><b>2.10:</b> Anthocyanin content, their antioxidant properties, and expression of anthocyanin biosynthetic pathway genes in pigmented Boro rice cultivars of Bangladesh</p>	<p><b>PI:</b> SH <b>CI:</b> HBS, RA and MAH</p>	<p>1. To evaluate physicochemical properties and anthocyanin content in the pigmented traditional boro rice cultivars</p> <p>2. Analysis of</p>	All-season	GQN and RAL

			expression of major genes (PAL, CHS, ANS) involved in anthocyanin biosynthetic pathway.		
<b>3: Commercial Rice-based Products</b>	<b>3.1:</b> Determination of physicochemical properties and nutritional quality of puffed, popped and flattened rice from BRR1 varieties	<b>PI:</b> MAH <b>CI:</b> HBS, TKS and NF	<ol style="list-style-type: none"> <li>1. To identify the physical quality of puffed, popped and flattened rice</li> <li>2. To determine the nutritional value and heavy metals in puffed, popped and flattened rice</li> </ol>	All-season	GQN Lab
	<b>3.2:</b> Survey on rice-based value-added products available in the market (Recommendation from BARC workshop-2022)	<b>PI:</b> MAH <b>CI:</b> TKS	<ol style="list-style-type: none"> <li>1. To find out BRR1 varieties are used commercially for producing rice-based products</li> <li>2. To analyze the nutritional quality of value-added rice-based products in the</li> </ol>	All-season	Divisional cities of Bangladesh and GQN Lab

			market		
	<b>3.3:</b> Formulation of rice-based foods supplemented with anthocyanin-enriched fermented rice bran	<b>PI:</b> HBS <b>CI:</b> Bhowmik (NRCC), Prefontaine (SFIDC), Kochian (GIFS), Sharpe (GIFS), KCD (NIB) and MAH	<ol style="list-style-type: none"> <li>1. Physicochemical and biochemical characterization of pigmented anthocyanin rich rice varieties.</li> <li>2. Genome sequencing and analysis of gene expression in the anthocyanin biosynthesis pathway in selected Bangladeshi rice varieties.</li> <li>3. Formulation of anthocyanin-fortified rice-based bakery products with fermented rice bran</li> </ol>	All-season	GQN Lab
	<b>3.4:</b> Formulation of rice porridge	<b>PI:</b> RA <b>CI:</b> SSD, HBS, SH and MAH	<ol style="list-style-type: none"> <li>1. To estimate SDS, RDS, and RS</li> <li>2. To estimate Na, K,</li> </ol>	All-season	GQN Lab



			Zn, Fe, and folic acid 3. Sensory evaluation		
<b>4: Remote Sensing in Precision Agriculture</b>	<b>Expt. 4.1:</b> Application of remote sensing in rice agriculture	<b>PI:</b> TKS <b>CI:</b> MMR(FMPHT), MAH(WMM), MAA(Stat.) and MAH	1.To monitor crops at different growth stages. 2.To ensure effective crop management 3.To validate precision agriculture in rice cultivation	All-season	BRRI HQ and RS