44th FNRI Seminar Series
Generating Sustainable Food Resources for Food Security, Optimum Nutrition and Wellness
July 4-6, 2018
Century Park Hotel, Manila

DOST-FNRI

Poster No.: 44FSS-03-04

Formulation and Characterization of Nutritious Instant Congee from Gamma-aminobutyric acid (GABA) rice as Calamity Food

Evadne S. Veluz[1], Ryan M. Conde[1], Manuel Joshua P. Joson[1], Geraldine G. Gantioque[1], Maricar B. Castillo[2], Rodel M. Bulatao[2], Marissa V. Romero[2]
[1]Department of Food Science and Technology, College of Home Science and Industry, Central Luzon State University, Science City of Muñoz, 3119 Nueva Ecija
[2]Rice Chemistry and Food Science Division, Philippine Rice Research Institute, Maligaya, Science City of Muñoz, 3119 Nueva Ecija

Introduction

Through the years, food innovation has brought a wider selection of products where consumers can satisfy their hunger while keeping them on-the-go. This is through **instant foods**.

benefits
- affordable and shelf-stable
- accessible
- **CONVENIENT**
- suitable for emergencies, calamities and disasters

instant foods

drawbacks
- lack of nutrients
- **UNHEALTHY**
- increase the risk of having illnesses

instant solution?

make it **functional!**

Did you know?

that **GABA rice** is good for...

our **body**
because it has **energy-boosting, health-promoting,** and **mental-enhancing** properties making it suitable as functional food.

our **farmers**
because value adding in rice provides **better agricultural livelihood** for our farmers. At the same time, it increases its market value, enabling farmers to commercialize their produce at almost the price

Objectives

- Characterize functional properties of GABA rice
- Optimize instant GABA rice congee production
- Assess eating quality and consumer acceptability of instant GABA rice congee
- Determine the microbial quality and nutritional composition of instant GABA rice congee

Methodology

GABA Rice

1 GABA Rice Production

2 Functional Property Analysis

- Water absorption index (WAI)
- Water solubility index (WSI)
- Swelling power (SP)
- Oil absorption index (OAI)

Instant GABA Rice Congee

3 Process Optimization

4 Microbial analysis

- coliforms
- Escherichia coli
- total plate count
- yeast and mold count

5 Sensory Evaluation

- Laboratory panel (n=12)
- Consumer panel (n=40)

6 Nutritional Analysis

- Ash
- Protein
- Fat

Results

Functional Properties of GABA Rice

GABA rice had high water absorption (1.29g/g) and oil absorption (2.14g/g) indices, low water solubility index (0.03%) and minimal swelling power (0.02g/g). Results implied that GABA rice could be used as based ingredient for the production of instant GABA rice congee.

Evaluation of Instant GABA Rice Congee

Had **low water activity** (0.387) indicating high stability against microbial spoilage

Had **high yield** (48.5%) and **rehydration rate** (77.8%) due to its high water uptake

Can be **good source of nutrients** such as protein (24.1%), lipids (5.4%) and inorganic minerals based on ash content (9.1%)

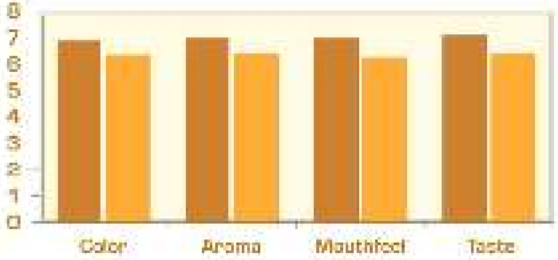
Safe to consume due to its low total plate (1.5x10³ cfu/g), yeast and mold (<1.0x10¹ cfu/g), *E. coli* (<1.0x10¹ cfu/g) and total coliform (3.0x10¹ cfu/g) counts

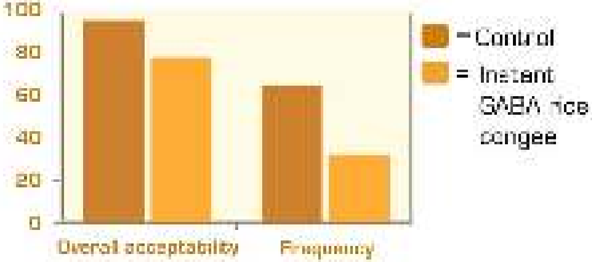
Sensory Attributes of Instant GABA Rice Congee

Treatments	Sensory Attributes							
	Color	Aroma	Taste/ Flavor	Saltiness	Smoothness	Off-odor	Off-taste	General Acceptability
Control	2.93	0.91	7.37	4.38	5.64	0.03b	1.11	7.53ab
T1 (raw, 1:5)	3.20	0.40	8.38	5.51	8.00	0.00b	0.40a	10.30a
T2 (raw, 1:8)	3.35	1.47	9.01	5.81	6.28	0.04b	0.14a	10.28a
T3 (precooked, 1:5)	2.05	0.14	5.34	4.50	6.89	6.48a	8.39a	1.93c
T4 (precooked, 1:8)	2.74	0.16	6.34	4.77	5.22	0.30b	2.44a	5.51b

All treatments had **comparable** color, aroma, taste/flavor, saltiness and smoothness. Instant GABA rice congee from **treatments 1 and 2 had the highest general acceptability**.

Consumer Acceptability of Instant GABA Rice Congee





Freshly cooked brown rice congee and reconstituted instant GABA rice congee had comparable color, aroma, and taste. Although the developed instant GABA rice congee had high consumer acceptability (77.5%), its value was lower than the control.

Conclusions

- ❑ Based on its functional properties, GABA rice is suitable for instant GABA rice congee production.
- ❑ Instant GABA rice congee at 1:5 rice to water ratio had the highest eating quality among the treatments and is acceptable to the consumers.
- ❑ Instant GABA rice congee is safe for consumption based on its acceptable water activity and microbial quality.
- ❑ Instant GABA rice congee can be an alternative to instant noodles and can serve as disaster food as it can provide nutrients that our body needs.

Recommendations

For the further improvement of the study, the following activities are recommended:

- ❑ Determine the shelf-life stability of the product.
- ❑ Fortify the developed product with antioxidant-rich vegetables.
- ❑ Develop other functional foods from GABA rice.

"Through the development of rice-based functional food products using Philippine varieties, we can **uplift the nutritional status of Filipinos** while providing **better agricultural livelihood** to our local farmers."

Department of Science and Technology
FOOD AND NUTRITION RESEARCH INSTITUTE
DOST-FNRI