

Department of Science and Technology FOOD AND NUTRITION RESEARCH INSTITUTE



#### **DOST-FNRI** Technology Offerings

#### 6th National Conference of Nutrition Action Officers (NAOs)

October 8, 2020

Presented by:

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## **PRESENTATION TRACK**

The DOST – FNRI

Processes in Food Product Formulation and Development

Description/ Characterization of the Food Products

Cost of Technology

Marketability





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DOST Compound, General Santos Avenue, Bicutan, Taguig City





**DOST-FNRI MANDATES** 

Undertake researches that define the citizenry's nutritional status, with reference particularly to the malnutrition problem, its causes and effects

Develop and recommend policy options, strategies, programs and projects for implementation by appropriate agencies

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





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## **DOST-FNRI** Technology Offerings

#### DOST-FNRI developed products go through different processes led by the **Food Research and Development Group**

- Optimization determining the best formulation and subjecting these to extreme conditions
- Standardization process of determining difference between batches and standardized the formula
- Safety -about handling, storing, and processing foods in such a way that it does not pose a hazardous threat
- Quality characteristics of food that is acceptable to consumers.
- Sensory acceptability food products are subjected to sensory evaluation



## **Food Analytical Service Laboratory**





## **Sensory Evaluation Laboratory**













 Efficacy trials
 Effectiveness trials
 Social marketing
 Other evaluation studies







## TRANSFERABLE AND COMMERCIALIZABLE FOOD TECHNOLOGIES





#### **Nutritious Food Products Relevant for Feeding Program**

#### **RICE-MONGO PRODUCTS**

#### COMPLEMENTARY FOODS

- Rice-Mongo Blend
- Rice-Mongo-Sesame Blend
- Rice-Mongo Crunchies
- Rice-Mongo Curls
- Ready-to-Eat Complementary
- Food (Paste) for Infants and Young Children (Momsie)
- Micronutrient Growth Mix (MGM)







#### **Nutritious Food Products Relevant for Feeding Program**

#### **FORTIFIED FOODS**

- Iron Rice Premix
- Iron Fortified Rice
- Iodine-Rich Drinking Water

#### **ENHANCED NUTRIBUN**



About THE TECHNOLOGY Rice-Mongo Products

### 6-35 Months Old

# <complex-block><complex-block>

Rice-Mongo Instant Blend



#### 12-35 Months Old







Net Wt. 30 g

NUTRITIOUS & DELICIOUS DEEP FRIED SNACKI

CRUNCHIES



## **ABOUT THE TECHNOLOGY**

- Rich in protein and energy
  - ✓ 120 kcal (energy)
  - ✓ 4 g protein per 30
  - Adequate to provide 16.7 % of recommended energy and 28.6 % of recommended protein of 6 months to <10 months old children
- Prepared by adding boiled water
- Shelf-life is one year





## **TECHNOLOGY COST**

#### **Rice-Mongo Instant Blend**









**ABOUT THE TECHNOLOGY** 

Rice-Mongo Sesame RTD Blend

Ready-to-cook blend



- contains 130 kcal (energy) and 4 grams protein per 30 grams serving portion
- Adequate to provide 18 % of recommended energy and 28.6 % of recommended protein intake of 6 months to <10 months old children

Shelf-life is one year



Crisp, expanded, ready-to-eat, snacks food made from a blend of rice flour and mongo flour

**ABOUT THE TECHNOLOGY** 

**Rice-Mongo Curls** 

- contains 130 kcal (energy) and 4 grams protein per 30 grams serving portion
- Adequate to provide 18 % of recommended energy and 28.6
   % of recommended protein intake of 1-3 year old children
- Shelf-life is 6 months





**Rice-Mongo Crunchies** 

**ABOUT THE TECHNOLOGY** 

- Nutritious deep-fried snack
  - Contains 580kcal and 8g protein per 100g
  - Two packs (30g per pack) of Rice-Mongo crunchies will provide 31.8% of RENI for energy
  - ✓ 14.3% for protein of 1 to 3 year-old children
  - ✓ Shelf life is 4 months





DOST-FNRI's program on the Nationwide Technology Transfer and Commercialization of Food Technologies



LEGEND

egarao City, Cagayan (RMC)

teo, Isabela (RMS)

Luna, Apayao (RMS 8

RMC Rice-Mongo Curls RMCr Rice-Mongo Crunchies

RM Rice-Mongo Instant Baby Food Blend RMS Rice-Mongo-Sesame Baby Food Blend

## ABOUT THE TECHNOLOGY Momsie



- Ready-to-eat complementary food
- High protein food made from locally-available raw materials
- Fortified with minerals & vitamins such as folate, iron, calcium, zinc, vitamin A and Vitamin C
- ✓ Target Group: children ages 6 months up to 3 years old



## ABOUT THE TECHNOLOGY Micronutrient Growth Mix (MGM)



Packed in small sachets (2g) containing blends of 6 micronutrients in powder form:

Vitamin A
Zinc
Vitamin B8
Vitamin B8
Iron
Iodine
Calcium



ABOUT THE TECHNOLOGY Micronutrient Growth Mix (MGM) 6



 Can be easily added to a wide-range of complementary foods and other home recipes to address vitamins and minerals deficiencies



## **COMPETITIVE ADVANTAGE**



**Micronutrient Growth Mix (MGM)** 



- Convenient
- Micronutrient-dense
- Low Cost
- Acceptable Sensory Properties
- Long Shelf-life











## The Nutribun...

- a ready-to-eat bread in the '70s
- distributed to public elementary school children to combat child malnutrition
- 30 million Nutribuns were given to 200,000 children from grade 1 to six during the school year of 1970 to 1971
- each bun had 500 kcalories and 17 grams protein





## The Enhanced Nutribun...

A ready-to-eat bread Launched in July 2020

- With natural color and flavor, softer in texture and containing vitamin A and other micronutrients
- Each bun has 500 kcalories and 17 g protein
- Has zero trans-fat and no cholesterol





#### Nutrition Facts Serving Size: 160 grams/piece



Amount Per Serving		% RENI*
Calories (kcal)	500	32
Calories from Fat (kcal)	80	
Total Fat (g)	9	
Saturated Fat (g)	4	
Trans Fat (g)	0	
Cholesterol (mg)	0	
Sodium (mg)	440	
Total Carbohydrates (g)	88	
Dietary Fiber	7	
Sugar		I-FNF

#### Nutrition Facts Serving Size: 160 grams/piece : 1



	% RENI*
18	59
264	40
6	60
461	30
2	30
223	60
	264 6 461 2

based on Adequate Intakes 2015 PDRI (6 to 9 Y.O. Males)



## **RON RICE PREMIX & RON FORTIFIED RICE**





## **RON RICE PREMIX**







ABOUT THE TECHNOLOGY Iron Rice Premix

- A grain like structure or kernel made from a blend of rice flour and iron
- Produced by hot extrusion technology
- Added to ordinary rice to increase its iron content
- Contains a minimum of 400mg iron/100g premix





## **RON FORTIFIED RICE**







## ABOUT THE TECHNOLOGY Iron Fortified Rice

- An enriched rice made by blending Iron Rice Premix (IRP) with ordinary rice using an efficient blending machine
- Can be washed and cooked like ordinary rice
- A day's intake of 4-6 cups of cooked IFR will meet more than 50% iron requirement of the body





## ABOUT THE TECHNOLOGY Iron Fortified Premix

- No discoloration
- Good iron
   retention after
   washing

Effective





Efficacious

#### Acceptable sensory attributes



# MARKET POTENTIAL



Philippine Rice Consumption for Social Safety Net Program for Supplementary Feeding (Maglalang, 2016)

Program	DSWD Budget for Rice	DepEd Budget for Rice	4 P's Pantawid Pamilyang Pilipino Program ACT of 2000	
Total Budget of Government	P 739,217,880	P696,093,000	41 STantawid Fannyang Finpino Flogram Act of 2000	
	\$15,546,608	\$14,609,990	Proposed Benefit for 4P's	25Kg fortified rice each 4P's Family
Target Number	2,053,383	1,160,155	Target Number	4,000,000
Total Budget for SSNP	1,435,310,880		Total Amount Ka	100 000 000
Kg, Rice Required	23,100,558.75	21,752,906.25	Total Amount, Kg	100,000,000
Est. Contribution used by SSNP 5%				



# MARKET POTENTIAL

#### **INDUSTRY PARTNERS**

Loronix Rice Mill Saavedra Rice Mill Bagayas Rice Mill Davao Region





CLG Health Food Products Inc. Gensan City

**Iron Fortified Rice** 

J.D. Aguilar Rice Mill San Leonardo, Nueva Ecija





Nutridense Food Mfg. Corp Sta. Barbara, Pangasinan






A refreshing iodine-rich drinking water made from a blend of distilled/purified/ordinary potable water and water plus

- No adverse taste, just like ordinary water
- Stable shelf-life (6 months & 2 weeks)
- Improves cognition mental ability



## ABOUT THE TECHNOLOGY Iodine-Rich Drinking Water



### TODINE PREMIX

a product formed by combining the food vehicle with a high concentration of fortificant







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## **DOST-FNRI** Technology Offerings

**Other Nutritious Food Products** 

### **Other Nutritious Food Products**

**STABILIZED BROWN RICE** 

#### FOOD FOR DISASTER/CALAMITY

Brown Rice Bar

#### **ETHNIC FOODS**

- Putsero Vegetable Mixed
- Thermally-Processed Instant Laing

#### SQUASH SUPPLEMENTED PRODUCTS

- Pancit Canton with Squash
- Bakery Products with Squash





## **Other Nutritious Food Products**

### NEW TECHNOLOGIES

- Extruded, Frozen, Ready-to-Fry Sweet Potato Fries
  - Rice-Mongo Curls and Baby Food Blend with Carrots
  - Micronutrient Growth Mix (MGM) 9&15
  - Sweet Sorghum Flour
  - Multi-nutrient Extruded Rice Kernels (MNERK)



# **STABILIZED BROWN RICE**





## ABOUT THE TECHNOLOGY Stabilized Brown Rice



- Extended shelf-life of 4-9 months
- Retained fiber content, B-vitamins and minerals which help address lifestyle-related diseases and mineral deficiencies
- Improved texture
- Shorter cooking time



## MARKET POTENTIAL Stabilized Brown Rice



**Primary customers (licensees)** 

- Large rice millers/traders (N. Ecija, Isabela, Pangasinan, Tuguegarao, Tacloban, Mindoro)
- Rice entrepreneurs/cooperatives in the Regions

Secondary customers (end-users)

- Health conscious individuals/weight watchers
- Regular brown rice eaters
- Diabetics or pre-diabetics



# MARKET POTENTIAL Stabilized Brown Rice









### **Brown Rice Nutty Fruity Bar**







### **Brown Rice Nutty Fruity Bar**



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DOST-FNR

#### **Brown Rice Nutty Fruity Bar**



#### **Extruded Brown Rice Puffs**

Nuts



# MARKET POTENTIAL



**Brown Rice Nutty Fruity Bar** 

RETAIL Health concious, weight watchers, students, etc.

## COMMERCIAL Supermarket, health stores, coffeshop

INSTITUTION UGU, feeding program, military ration, emergency-response organization





Canned ready-to-eat combination of potato, cabbage, saba, baguio beans and spices





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DOST-FNR



### **Thermally Processed Instant Laing**

- Canned, ready to eat combination of taro (gabi) stalks, coconut milk and spices.
- Consumption of vegetables helps increase intake of vitamins, minerals, and fiber





### MARKET POTENTIAL Pochero and Laing



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#### DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT Disaster Response Assistance and Management Bureau (DReAMB)

MEMORANDUM FOR THE SECRETARY		File/Ref. No.	My docs/BRADDY/enhancement of family food packs 08-03-//		
		Date :	31 July 2015		
FOR	HON. CORAZO	HON. CORAZON JULIANO-SOLIMAN			
	Secretary				
FROM	THE DIRECTO	THE DIRECTOR IV			
SUBJECT	ENHANCEMEI	NT OF FAMILY FOOD PA	CKS		

This is to respectfully request the approval of the Honorable Secretary for the enhancement of family food packs based on the Recommended Nutrient Intake (RENI, 2015 publication) to a family of five (5) members. The following are the recommended food items submitted by the Food and Nutrition Research Institute (FNRI- DOST) which was concurred by the technical working group composed of the DSWD, FNRI, DOST, National Nutrition Council (NNC) and the World Food Programme (WFP):

#### Family food pack contents for two (2) days with Key Nutrient Contribution and Cost.

FOOD ITEM	UNIT	ENERGY (Kcal)/ day	NUTRIENTS/day			COST (PhP)	
			PROTEIN (g)	IRON (mg)	VIT. A (ug)	Unit cost	ltem cost
Rice, Iron Fortified	6 kgs	10,500	210	60	0	31.00	186.00
Corned Beef, Canned (150g)	2 can	306	22.4	1.4	7.5	19.70	39.40
Sardines, Canned (155g)	4 cans	394	31.6	0	167.4	13.00	52.00
Laing, Canned (155g)	2 cans	524	15.3	45	0	30.00	60.00
Pinakbet, Canned (225 g)	2 cans	200	12	0	420	30.00	60.00
Multi-nutrient growth mix (2 g.)	20 pcs.	50	0	20	2270	2.00	40.00
Instant Coffee	6 sachets	294	0.9	0	0	5.00	30.00
Total		12,268	292.2	126.40	2,864.9		467.40

Also attached is a copy of FNRI report on the Improvement of the Nutritional Quality of the DSWD Family Food Pack for your reference.

RCH INSTITUTE



## MARKET POTENTIAL Pochero and Laing





DISASTER RESPONSE ASSISTANCE AND MANAGEMENT BUREAU (DREAMB) Disaster Response Operations Monitoring and Information Center

#### DSWD DROMIC Report #26 on Tropical Depression "URDUJA" (KAI-TAK)

as of 04 January 2017, 8AM

#### **Situation Overview**

On 12 December 2017, the monitored Low Pressure Area east of Hinatuan, Surigao del Sur has developed into a Tropical Depression and was named "Urduja" (international name: Kai-tak). It exited Philippine Area of Responsibility (PAR) on 19 December 2017.

Source: NDRRMC

#### Status of Affected Families / Persons

435,999 families or 1,860,026 persons are affected in 2,537 barangays in Regions V, VI, VII, VIII, MIMAROPA and CARAGA (see Table 1; details in Annex A).

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## SQUASH SUPPLEMENTED PRODUCTS



Buns

#### **Pandesal**

Loaf

Canton



ABOUT THE TECHNOLOGY Pancit Canton with Squash

## Nutritious noodles from a blend of flour and squash puree

- Rich source of Vitamin A
- Natural yellow color
- Improved nutrition





TECHNOLOGY COST Bakery Products with Squash	
R & D Cost:	P500K
Equipment Cost:	P200K
<b>Proposed Selling Price</b>	P2/pc pandesal
<b>Technology Licensing Fee:</b>	N/A (Public Good Technology)
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## **NEW TECHNOLOGIES**







## Multi-Nutrient Extruded Rice Kernels (MNERK)





- With extrusion technology, there is an opportunity to replace iron with multinutrient kernels in rice addressing not only anemia but also vitamins and mineral deficiencies in the Philippines:
- Vitamin A
- Iron
- Zinc
- Vitamin B1
- Vitamin B2
- Folic Acid
- Iodine



## **Rice-mongo (RM) complementary/snack foods with carrots**



- The nutritional value of complementary foods are improved by adding carrots.
- Carrots are one of the best sources of Beta-Carotene, the precursor of Vitamin A.



## **VICRONUTRIENT GROWTH MIX (MGM) 9 & 15**



#### Packed in small sachets (2g) containing blends of micronutrients in powder form:

#### MGM 9

- Vitamin A
- Vitamin B1
- Vitamin B12
- Vitamin C
- Folic acid
- Iron
- Zinc
- Iodine
- Calcium

#### **MGM 15**

- Vitamin A
- Vitamin B1
- Vitamin B2
- Vitamin B3 -
- Vitamin B6
- Vitamin B12
- Vitamin C
- Vitamin D

- Vitamin E
- Folic acid
- Iron
- Zinc
  - Iodine
- Copper
- Selenium



## **R**EADY-TO-FRY SWEET POTATO FRIES



 An extruded frozen ready-to-fry sweet potato fries cold extrusion technology, provide especially designed, and value added snack food considering the nutritional benefits from the sweet potato as compared to the common potato to make snacks like fries and chips.



## **Sweet SORGHUM FLOUR**



- Gluten-free sweet sorghum flour is a suitable raw material for the development of rice-shaped kernel, pasta noodles, biscuits, and snack foods.
- It can benefit individuals who need a gluten-free diet. Following a gluten-free diet can help ease digestive problems for people with celiac disease and nonceliac gluten sensitivity.



## Average Payback Period and ROI of DOST-FNRI Technologies







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## DOST-FNRI'S TECHNOLOGY TRANSFER POLICIES & PROCEDURES

### DOST-FNRI Administrative Order No. 002 series of 2013

#### **DOST-FNRI**

#### issued these guidelines.

#### DOST-FNRI Administrative Order No.002 series of 2013: FNRI TECHNOLOGY TRANSFER POLICIES AND PROCEDURES

Republic of the Philippines Department of Science and Technol FOOD AND NUTRITION RESEARCH INSTITUTE General Santos Avenue, Bicutan, Taquig City, Philippines Tel. Nos.837-2934, 837-1839, 837-2071 to 82 local 2296, 837-8113 to 14 loc. 318 Fax No. (632) 837-3164. E-mail: mvc@fnri.dost.gov.ph, mar\_v\_c@yahoo.com. Website:http://www.fnri.dost.gov.ph "FIGHT MALNUTRITION WITH ACCURATE DATA, CORRECT INFORMATION, AND INNOVATIVE TECHNOLOGIES" December 5, 2013 FNRI Administrative Order No.002 Series of 2013 Subject FNRI TECHNOLOGY TRANSFER POLICIES AND PROCEDURES In line with the enactment of Republic Act 10055 (Philippine Technology Transfer Act of 2009) and its Implementing Rules and Regulations (IRR) and to provide its clientele with an overview of its technology transfer policies and procedures, the Food and Nutrition Research Institute - Department of Science and Technology (FNRI-DOST) hereby issue these guidelines. I. GUIDING POLICIES AND LEGAL BASIS As mentioned under Article I, Section 2 of Republic Act 10055; The State fully recognizes that science, technology and innovation are essential for national development and progress. It shall, therefore, give priority to research and development, invention, innovation and their utilization. It shall also encourage the widest and most systematic participation of all stakeholders in policy-making related to science and technology, and in the generation, transfer and utilization of intellectual property, especially for the benefit of the general public.1 The State shall facilitate the transfer and promote the utilization of intellectual property for the national benefit and shall call upon all research and development institutes and/or institutions (RDIs) that perform government-funded research and development (R&D) to take on technology transfer as their strategic mission and to effectively translate results of government-funded R&D into useful products and services that will redound to the benefit of Filipinos, notwithstanding the income generated from intellectual property rights (IPRs) and technology transfer activities.<sup>2</sup> The State acknowledges that the successful transfer of government-funded R&D results depend on the proper management of intellectual property, development of capacity by RDIs to become selfsustaining and competitive, and on enhancing interaction and cooperation with the private sector. particularly small and medium enterprises through collaborative and contract research based on equitable, fair access, and mutual benefit for all involved partners.3 **II. BACKGROUND** The FNRI has the thrust to develop nutritious, safe and affordable food products and transfer these technologies to the entrepreneur for their commercial production and distribution. From this thrust stems the FNRI's program on the Nationwide Technology Transfer and Commercialization of 1.2.3 Article I, Section 2 of Republic Act 10055

Page 1 of 5

### WHO MAY ADOPT THE TECHNOLOGIES



- The transfer and commercialization of different mature technologies of DOST-FNRI is open to all
  - ✓ NGOs,
  - Individuals,
  - ✓ Cooperatives,
  - ✓ Corporations,
  - ✓ Local Government Units or Educational Institutions.



### **TECHNOLOGY TRANSFER PROTOCOL**

 Interested parties who want to avail of any DOST-FNRI-developed technologies simply follow the protocol on technology transfer as seen on the flowchart





Transaction Completed

## **OTHER PROVISIONS**

- Waived tech transfer cost for the technologies considered as public goods
  - (e.g. complementary foods and bakery products with squash)
- Non disclosure of any information
- *(e.g. process & product formulation)* nor the transfer of the technology to any other parties without its consent even beyond the termination of the Agreement
- License granted to the adoptors is <u>Non exclusive</u>.







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#### **DOST-FNRI**

## DOST-FNRI Technology Adoptors Nationwide



#### **Summary of Technology Adoptors**

Region	# of Technology adoptors
NCR	7
CAR	2
Region I	2
Region II	5
Region III	3
Region IV-A	8
Region IV-B	6
Region V	3
Region VI	5
Region VII	1
Region VIII	23
Region IX	1
Region X	4
Region XI	2
Region XII	3
Region XIII	2
BARMM	1
Total	78



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#### Summary of Technology Adoptors per Technology

Food Technologies	# of Technology adoptors
Complementary Food Production Facility (Nationwide)	33
New Areas CFPF *	8
Bakery Products with Squash*	18
Canton Noodles with Squash*	13
Tubig Talino*	6
Stabilized Brown Rice*	4
Iron fortified Rice*	4
Brown Rice Bar*	2
Enhanced Nutribun*	12
Other Technologies	
CKD Materials*	1
Nutrition Educator's Kit*	1
Pingang Pinoy Food Plate*	1
* Selected Areas	



FOOD A

#### Summary of Technology Adoptors of Enhanced Nutribun

Technology Adoptors (signed TLAs as of Oct. 7, 2020)	Location	Ann Dealachailthean
Aretei Food Corporation	Marikina City	Ang Pagbabalik ng
Nutridense Food Manufacturing Corp	Sta. Barbara, Pangasinan	NUTRIBUN
AJ'S BREAD AND PASTRIES	Mahatao, Batanes	
JBM Food Products	Cabanatuan, Isabela	
J.A. Fruits & Vegetable Processing	San Mateo, Isabela	
J's Bakeshop & Delicacies	Camalaniugan, Cagayan	
Susan's Bakeshop	Piat, Cagayan	
Lea's Special Uraro Cookies	Sta. Cruz, Marinduque	Department of Science and Technology FOOD AND NUTRITION RESEARCH INSTITUTE
Rejano's Bakery	Sta. Cruz, Marinduque	
AAV Food Corp	Pili, Camaries Sur	
Saints Baked Delights	Dumaguete City	
Delta Business Ventures	Aloran, Misamis Occ.	



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\* Selected Areas

### **Call to action for NAOs**

Make representation to Local Chief Executives to allocate more funds for feeding

- Maximize the use of the DOST-FNRI-developed technologies in the feeding programs
- Encourage and refer potential MSMEs to adopt DOST-FNRI food technologies
- Provide marketing and sales outlets for DOST-FNRI food products
- Do accurate masterlisting and documentation of nutrition services availed by the community
- Capacitate the BNS/BHW to do more referrals to the health facilities for early interventions and monitoring



## FOR INQUIRIES, WRITE OR CALL

#### **Dr. Imelda Angeles-Agdeppa**

Chief SRS, NAMD and Scientist II, Officer-In-Charge, Office of the Director



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## THANK YOU

