



# 2022

## ANNUAL REPORT

Steering R&D and S&T Innovations to New Heights:  
**THE MISSION CONTINUES**



## ABOUT THE COVER



The cover shows DOST-FNRI's rocketship taking-off to reach greater heights by continuing its mission of providing accurate data, correct information, and innovative technologies in fighting malnutrition for 75 years. As such, the rocketship carries the milestone 75th anniversary logo.

The radar shows that the Institute is expertly navigated and on the right track. Going green is thinking about the future. DOST-FNRI envisions optimum nutrition for all Filipinos. The dominant color of the cover represents this vision.

Steering the rocketship of the Institute to new and uncharted heights can be possible by staying committed to its core values of Excellence, Action-oriented, Teamwork and Sincerity (EATS).

DOST-FNRI is dedicated to keeping its momentum in staying at the forefront of food and nutrition.



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# MANDATES

As per Executive Order (EO) 366 of November 13, 2009, the DOST-FNRI is mandated to:

- Undertake researches that define the citizenry's nutritional status, with reference to the malnutrition problem, its causes and effects;
- Develop and recommend policy options, strategies, programs, and projects which address the malnutrition problem for implementation by appropriate agencies; and
- Diffuse knowledge and technologies in food and nutrition and provide S&T services to relevant stakeholders.

# MISSION

Provide accurate data, correct information, and innovative technologies to fight malnutrition

# VISION

Optimum nutrition for all Filipinos, socially and economically empowered through scientifically sound, environment-friendly and globally competitive technologies





# QUALITY POLICY

We are committed to provide products and services in food and nutrition to all stakeholders in accordance with the applicable statutory and regulatory requirements with the highest standards of quality and reliability within our capabilities and resources to plan and implement actions to address risk and opportunities, and to continually improve the effectiveness of our QMS at all times.

# FNRI CORE VALUES

**E**xcellence

**A**ction-oriented

**T**eamwork

**S**incerity





# MESSAGE FROM THE SECRETARY

My commendations to the Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI) for its commitment in providing strategic solutions to malnutrition across all life stages, particularly the poor and aging population through its food and nutrition research & development (R&D) and scientific and technical (S&T) services. These strategic solutions are embedded in the Institute's Institutional Roadmap that prioritizes the poor, the children with unhealthy lifestyle, and the aging groups. They are the beneficiaries of the R&D programs on poverty alleviation and inclusive growth, which are aligned with the priorities of the current Administration and the Department's thrust.

It is laudable that despite the continuing threat of COVID-19, the Institute was able to complete 52 projects. These addressed micronutrients and macronutrients deficiencies, nutrition in the life cycle, food quality and safety. Likewise, development of tools, food product innovation, R&D on emerging diseases, nutrigenomics, intervention and policy studies, nutrition surveys and related studies, in-depth and correlation studies, technology transfer and commercialization, knowledge diffusion and efficient governance were also pursued. These projects reached out to the public, entrepreneurs, and other valued stakeholders to help improve health, nutrition, and food security.

Throughout the past year, the DOST has supported the DOST-FNRI in maximizing R&D results through its technology transfer and commercialization. I am happy to note that the Institute conducted 98 site visits and forged 213 technology licensing agreements (TLA) among micro, small, and medium

enterprises (MSMEs) and other technology adopters. Furthermore, the Institute's strengthened science, technology, and innovation (STI) collaborations with international organizations, private industry, foundations, professional organizations, and individuals have produced new food and nutrition

projects, innovations, tools, and educational materials.

For efficient governance, the DOST-FNRI continued supporting and developing the skills and knowledge of its human resources through formal and non-formal training. For 2022, it is noteworthy that DOST-FNRI sent six (6) personnel to pursue doctoral degree studies and three personnel for masteral degrees in local and international universities. I encourage the DOST-FNRI to continue developing the skills and knowledge of researchers and support personnel through formal and non-formal trainings to ensure their career paths are on track and competency-building of the younger generation and the support staff.

The scientific productivity of the DOST-FNRI and its highly skilled staff was manifested through 18 technical publications and grant of five utility models, three trademarks and 74 copyrights. These accomplishments were recognized by the National Academy of Science and Technology (NAST) during the 2022 Intellectual Property Awards.

Lastly, I congratulate the DOST-FNRI for the numerous local and international awards it received in 2022. These awards are testament of DOST-FNRI's dedication and commitment in the pursuit of excellence in food and nutrition R&D.

The DOST will continue to adhere to its vision of providing world-class science-based and data-driven solutions that help increase productivity and enhance quality of life for Filipinos. It is well-acknowledged and proven that research, science, technology, and innovation are crucial for national development. As I have repeatedly said "*Sa Siyensya at Teknolohiya, negosyo tiyak ay kikita. Sa Siyensya at Teknolohiya industriya ay aarangkada. Sa Siyensya at Teknolohiya, kalusugan ay sisigla. Sa Siyensya at Teknolohiya, buhay ay gaganda. Isa lang ang sinasabi ng mga ito: na ang lahat ng serbisyo at produktong ibinabahagi natin ay malaki ang mailambag sa kaunlaran ng pamumuhay ng bawat Pilipino*".

I thank the DOST-FNRI family, through the able leadership of Dr. Imelda Angeles-Agdeppa, Director IV and Scientist IV, for continuously working towards improved food security and nutritional status of Filipinos.

Mabuhay ang DOST-FNRI!

**Dr. RENATO U. SOLIDUM, JR.**  
DOST Secretary



# MESSAGE FROM THE DIRECTOR

Steering the Institute's rocketship to greater heights of success and growth is always a challenge when the situations are ever-changing. The Institute's momentum may have slowed down during the early days of the pandemic, but in 2022, as the country gradually got back on its feet and re-emerged from the COVID-19 crisis, the DOST-FNRI tuned-up its engine for driving towards more innovation and strategic initiatives.

To stay ahead of the curve, the DOST-FNRI's frontrunners, along with effective data-driven decision-making, direction, and minor fine-tuning on the rocketship, the Institute defied gravity with 52 research and development projects and science and technology activities. The researches responded to major nutritional concerns addressing micronutrient and macronutrient deficiencies, normal nutrition and nutrition-related diseases, food quality and safety, development of tools and guidelines, food product innovation, emerging diseases, nutrigenomics, efficient governance, and intervention and policy studies.

Among the most momentous accomplishments include studies on coconut-based complementary foods, development of food safety guidelines for the food service sectors, the Philippine Nutrient Profile Model, Optidiets: optimization of low-cost, nutritionally-adequate diets for Filipinos using a software analysis tool, healthy snacks and beverage recipes, in-vitro mineral availability from meals based on Pinggang Pinoy® recommendations, among others.

On food product innovations, shelf-life studies have been explored on ready-to-eat instant meals such as instant pork picadillo with ready-to-eat dried fruit mix, prebiotic-rich granola, iron-fortified rice and protein cracker using fabricated blending machine, among others. Studies on virgin coconut oil (VCO) have also shown promising results, as it was confirmed effective as an adjunct therapy against COVID-19.

On Nutritional Assessment and Monitoring Program, several studies on infants and young children, women of reproductive age, Filipino adolescents, food consumption, anemia, high blood pressure, high fasting blood glucose, Vitamin A status, Iodine status, among others were explored.

To add more fuel that propelled our rocketship to venture into new heights, the Technology and Knowledge Diffusion Program kept its pace with the Malnutrition Reduction Program (Roll-Out of Complementary Food Processing Facility Batch

3 and DOST-PINOY), while the Behind Numbers project generated 25M, 18M, 1.2M, 4M, and 330k total media values on media placement, television, live interviews, and print, respectively. These helped DOST-FNRI reach the 519M media mileage in 2022.

The taking-off of a rocket means development and innovation, but sustaining its momentum will be more achievable with the help of our current and future rocketeers. Our trust and support to our pilots and crew serve as the potential energy that can be unleashed towards new frontiers, until the Institute reaches its zenith of success, as we work together as a team.

Here's to those who steer the nation towards improved nutrition! Salute to us all at the DOST-FNRI!

*Maraming salamat sa oportunidad na makapaglingkod sa ating bayan!*

*Mabuhay tayong lahat!*

**IMELDA ANGELES-AGDEPPA Ph.D.**  
Director IV and Scientist IV





## PURSUED R&D NATIONAL PROBLEMS

- R&D Program Addressing Micronutrient Deficiencies
- R&D Program Addressing Macronutrient Deficiencies
- R&D Program Addressing Normal Nutrition and Nutrition-related Diseases: Nutrition in the Life cycle Program
- R&D Program on Food Quality and Safety
- R&D Program on Development of Tools and Guidelines
- R&D Program on Food Product Innovation
- R&D Program on Emerging Diseases
- R&D Program on Nutrigenomics
- R&D Program on Efficient Governance: Services to Internal and External Clients
- R&D Program on Intervention and Policy Studies
- In-depth and Correlation Studies
- Nutrition Survey and Related Studies
- Technology and Knowledge Diffusion Program



## STRENGTHENING STI COLLABORATIONS

**16** government funded R&D and S&T projects

**1** funded project from international organization

**4** funded projects from private industry

**2** funded projects from foundations/ professional organizations/ individuals

**161**

## AWARDS



Steering R&D and S&T  
Innovations to new Heights:  
**THE MISSION CONTINUES**

## ENHANCED EFFECTIVENESS OF STI GOVERNANCE

**18** Scientific papers published

**64** Scientific papers presented



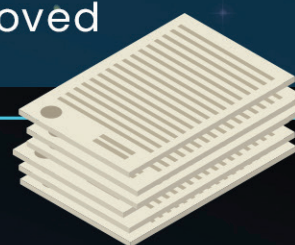
## MAXIMIZE UTILIZATION R&D RESULTS THROUGH TECHNOLOGY TRANSFER AND COMMERCIALIZATION

**98** site visits conducted

**74** copyrights produced

**4** utility models approved

**213** TLAs signed



## DEVELOP STI HUMAN RESOURCE

### DOST-FNRI LIBRARY

**127** Walk in library users

**891** Online clients

**159,646** Hits on DOST-SciNet

**135** FIRSt collection including publications, theses and dissertations

### TRAININGS

**79** In-house Trainings

**28** On-the-job trainings



### SOCIAL MEDIA INSIGHTS

**216,426** Total engagment in Facebook

**54,233** Tweet impressions



**TOTAL MEDIA MILEAGE  
PHP 519 MILLION**





# OUTCOME 1

**R&D Program Addressing  
Micronutrient Deficiency**



# BETA-CAROTENE RICH RED PALM OIL

Marcela C. Saises, Abbie L. Padrones, Aiza B. Umali, Bianca Drew Marie M. Espeño, and Junimer B. Lala



The latest National Nutrition Survey showed that 2 out of 10 children 6 months to 5 years old are vitamin A deficient. Despite efforts in combating this deficiency, it remains a moderate public health concern, which is why vitamin A is recommended to be added to staple foods, like cooking oil. Through this intervention, it is expected to help improve vitamin A status in the general public. In addition to fortification of staple foods with vitamin A, food processors are also fortifying their products to support government efforts in addressing the micronutrient deficiencies. In particular, Agri Pacific Corporation, a newly established fats and oil manufacturing plant located in Tanza, Cavite launched their beta-carotene rich, red palm oil. They partnered with the DOST-FNRI to study the stability of beta-carotene in their red palm oil. Samples of red palm oil were assessed for twelve months, and it was shown that the vitamins and minerals present in the products were stable.

Red palm oil is extracted from the reddish pulp of the fruit from oil palm and is obtained through mild processing of crude palm oil including pre-treatment, deacidification, and deodorization. Since the oil did not go through refining and bleaching, it has retained its distinct redness and unique flavor. This distinctive

red color is due to high levels of carotene, and phytochemicals, and tocotrienols.

The red palm oil samples from Agri Pacific Corporation were used in frying chicken nuggets, fish, and rice. The fried food samples and the used red palm oil were analyzed for beta-carotene content. Results showed that all fried foods absorbed significant amounts of beta-carotene. To illustrate that the absorbed beta-carotenes were from the red palm oil, bleached cooking oil was



Fried Chicken Nuggets in Red Palm Oil (T1)



Fried Chicken Nuggets in Red Palm Oil (T2)



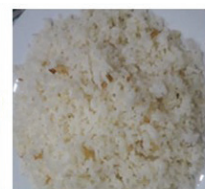
Fried Chicken Nuggets in Palm Oil



Fried Rice in Red Palm Oil (T1)



Fried Rice in Red Palm Oil (T2)



Fried Rice in Palm Oil



Fried Fish in Red Palm Oil (T1)



Fried Fish in Red Palm Oil (T2)



Fried Fish in Palm Oil

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**Red palm oil: packed with heart-healthy benefits**  
**Your fried foods, made with heart-healthier benefits**

”



also used in frying nuggets, fish and rice, and the fried samples. The unused and used cooking oil were submitted for analysis. There were no beta-carotenes detected in all fried samples using bleached cooking oil. Results showed using red palm oil in cooking can increase the beta-carotene content in fried foods. In addition, all fried foods using the red palm oil were found acceptable by sensory panelists in terms of appearance, color, odor, taste, texture, and general acceptability.

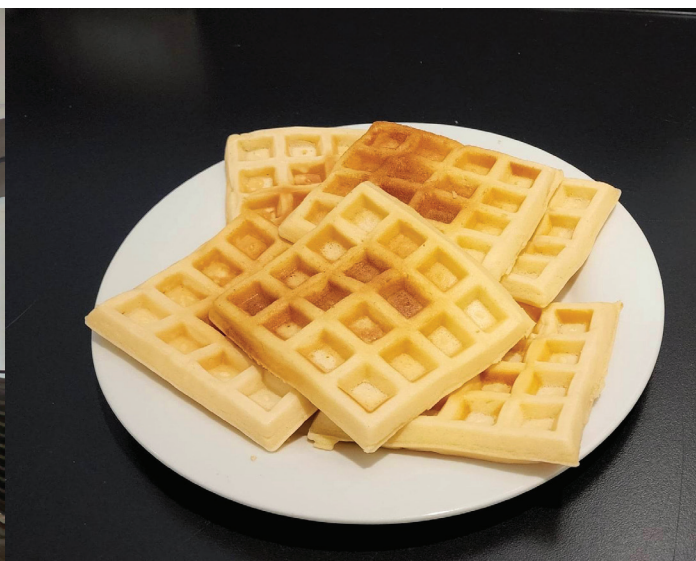
Comparing the beta-carotene of the red palm oil based on the Philippine Food Composition Table Online Database (PhilFCT) shows that the red palm oil contains at least 2.51 times higher as many retinol equivalents as tomatoes and 99.51 times higher as carrots. A 15-milliliter (mL) serving of the red palm oil can contribute at least 60% of the Recommended Nutrient Intake (RNI) of vitamin A for an adult male 19-29 years old.

The beta-carotene rich red palm oil is commercialized by Agri Pacific and is being sold in the market as Pacific Sunrise. Efficacy studies may be conducted for the beta-carotene rich red palm oil to confirm that it will benefit target consumers.



# REVISITING RA 8976: INTEGRATING FOLIC ACID IN FLOUR FORTIFICATION

Abbie L. Padrones, Richard L. Alcaraz, Maricar D. Albao, and Junimer B. Lala



Republic Act (RA) 8976 or the “Act Establishing the Philippine Food Fortification Program and for Other Purposes”, also known as “The Philippine Food Fortification Act of 2000”, has been in effect for 22 years. Under the law, staple foods like rice, sugar, cooking oil, and flour, should be fortified with iron and vitamin A. Presently, there are petitions to amend RA 8976, including the removal of sugar fortification, updating of iron rice premix specifications, and the addition of folic acid fortification as a national public health intervention to address the occurrence of birth defects.

In the case of flour, all industrial millers in the Philippines, add iron and vitamin A in their commercial flour (FFI, 2019). However, the Philippines is also one of the five countries that do not carry out mandatory folic acid fortification, suggesting a missed opportunity for the health benefits of folic acid fortification (Padilla, 2017). Numerous studies suggested that pregnant women

who take folic acid supplements decrease the prevalence of neural tube defects (NTD) including spina bifida, stillbirth, and miscarriage. One of the strategies that can be used to address vitamin and mineral deficiencies is food fortification. Wheat flour is one of the food products fortified due to the widespread consumption of bakery products.

“

**Securing the future:  
Integrating folic acid  
in flour fortification**

”





The DOST-FNRI is a member of the Technical Working Group for Mandatory Food Fortification (TWG-MFF) was assigned to conduct a study on the retention, stability, and acceptability of wheat flour fortified with folic acid in addition to iron and vitamin A. The study consisted of flour fortification in laboratory and pilot scale; establish the amount of folic acid that should be added; and determine the remaining amount of the nutrient after cooking and storage. Physico-chemical, nutrient analyses, and sensory evaluation were conducted to measure the effects of the fortification process on flour. Results of these trial runs will serve as basis for the issuance of the resolution for the inclusion of folic acid in the mandatory fortification of wheat flour by the National Nutrition Council Governing Board (NNC GB).

The fortified flour appeared like unfortified flour. It was also observed that the addition of folic acid did not affect the physico-chemical and sensory qualities of the flour. Recommended levels for the nutrients, considering cost and quality characteristics are as follows: 50 milligrams (mg) iron, 3 mg vitamin A, and 5 mg folic acid, per kilogram flour. At least 85% of the folic acid was retained in the flour after processing and at least 60% after 6 months of storage. More importantly, the fortified flour was tested for aflatoxin, heavy metals, and microbiological analysis and was proven safe for human consumption.

A 60-gram waffle prepared using the fortified flour was found acceptable by sensory panelists. It can provide at least 43% of the recommended nutrient intake (RNI) of folate for male and female, 19 years and older. Time and motion study showed the estimated cost of fortified wheat flour to be P80.57 per kilogram based on pilot-scale production. This is similar to current market price of vitamin A and iron fortified wheat flour of around P70.00 to P100.00 per kilogram. Carrying out large-

scale production can maximize operating activities, reduce production cost, and lower the selling price of the fortified flour.

Additional research, like efficacy studies, commercial testing, technology transfer, and consumer awareness programs, will help facilitate issuance of the resolution, and implementation of the mandatory addition of folic acid to flour. The mandatory fortification of folic acid to flour may help in bringing to the public the potential long-term beneficial effects of folic acid, such as decrease in birth defects and increase in folic acid sufficiency.





# **R&D PROGRAM ADDRESSING MACRONUTRIENT DEFICIENCY**



# BOOST YOUR CHILD'S NUTRITION WITH COCONUT-BASED COMPLEMENTARY FOODS

Alex M. Palomo, Vannizsa I. Ramas, Carissa T. Saldaña, Charlie E. Adona, Ruben N. Panis, Filoteo D. Ponte, Robert G. Aduana, and Johnellie S. Palafox



Childhood malnutrition partly caused by consuming complementary foods with low-nutrient density is common in low- and middle-income countries. In the Philippines, one out of three Filipino children under five years old is stunted, which is a mark of chronic malnutrition. This may be because Filipino children are not receiving appropriate quantity and quality of complementary foods. This is supported by the DOST-FNRI's 2018 Expanded National Nutrition Survey (ENNS) which reported that nine out of ten Filipino infants and children do not receive appropriate complementary feeding based on the minimum acceptable diet.

Stunting occurs when a child's height is too low for his/her age based on the World Health Organization's Child Growth Standards (WHO-CGS). The most common cause of stunting is lack of essential macro and micronutrients, such as protein, iron, and zinc in the diet of children. If not corrected in the first 1,000 days, which is from conception until the age of two years, it can cause adverse functional consequences on the child, such as poor cognition, poor educational performance,

low adult wages, lost productivity and increased risk of nutrition-related chronic diseases later in adult life.

Complementary foods are foods and beverages that are suitable to complement breastmilk or infant formula to satisfy the nutrient requirement of children 6 months to 2 years old. Appropriate complementary feeding is critical for young children to ensure

survival and achieve healthy growth and development. Complementary foods are expected to have sufficient energy density, balanced protein composition, required micronutrients, like iron, folic, and zinc, has no anti-nutritional components, and has appropriate sensory qualities for palatability (Abeshu et. al., 2016).

In the past years, DOST-FNRI already developed highly-acceptable complementary foods from indigenous sources, such as rice and mungbean. These complementary food technologies have been successfully rolled out in the different regions in the country. However, several Complementary Food Processing Facilities (CFPF) were not able to maximize their production capacity due to lack of raw materials and distribution channels, among others. This led to the limited availability of the DOST-FNRI developed complementary foods in the market.

In an effort to help address stunting among children and to maximize the production capacity of the CFPFs all over the country, a team from DOST-FNRI developed seven (7) coconut-based complementary food



Coco Puff

Coco Blend

Coco Bisc

Coco-Mungbean Puff

Coco-Mungbean Blend

products that can satisfy the energy, macronutrients, and micronutrient requirements of children 6 months to 2 years old.

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**In an effort to help address stunting among children and to maximize the production capacity of the Complementary Food Processing Facilities all over the country, DOST-FNRI developed seven coconut-based complementary food products that can satisfy the energy, macronutrients, and micronutrient requirements of children 6 months to 2 years old.**

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Coconut flour was identified as the main raw material because it has significant amounts of macronutrients, such as fat and protein, and is a good source of dietary fiber, making it a promising raw material and functional ingredient in the development of new variants of complementary foods. Moreover, the Philippines is the second largest producer of coconut in the world next to Indonesia. Despite this, the coconut processing industry is not thriving because of lack of innovation and value-added processes to coconut products. Coconut flour has a low market value and is usually sold as animal feed (Bayalan, 2000). Upgrading the use of coconut flour from animal feed to a high value food product will greatly benefit not only the coconut industry but the country as well.

The coconut-based complementary food products developed include: Coco Puff (corn-coco and rice-coco variants), Coco Blend (corn-coco and rice-coco variants), Coco Bisc, Coco-Mungbean Puff, and Coco-Mungbean Blend.

These developed coconut-based complementary food products have a shelf life of at least 6 months, are good sources of energy, and excellent sources of protein, dietary fiber, and minerals.

Coco Blend can provide 17% calories, 28% protein, 10% zinc and 8% iron of the Recommended Energy and Nutrient Intake (RENI) of infants 6-12 months old. Coco Puff and Coco Bisc can provide 11% and 13% calories, 14% and 9% protein, 33% of dietary fiber, 9% and 10% zinc, 8% and 10% iron, respectively, of the RENI for children 1-3 years old. The developed coconut products also have satisfactory sensory profiles with acceptability scores ranging from “like moderately” to “like very much”. Financial feasibility study of the developed complementary food products obtained a positive net-present value, which indicates a good, positive net cash flow within 5 years with a 1 to 2-year payback period. Feasibility study also suggests that the coconut-based complementary food products are suitable for scale-up production and technology adoption, which can provide alternative products for institutional feeding programs and maximize production capacity of existing complementary food facilities. Promotion of the technology on coconut-based complementary food products to different stakeholders for possible adoption is recommended.





**R&D PROGRAM  
ADDRESSING NORMAL  
NUTRITION AND  
NUTRITION-RELATED  
DISEASES:  
NUTRITION IN THE LIFE  
CYCLE PROGRAM**

# WHY ARE FILIPINO ADOLESCENTS PHYSICALLY INACTIVE TODAY?

Marilou L. Madrid, Jason Paolo H. Labrador, Shaira G. Carandang,  
Noelle Lyn Santos, Hazel T. Lat, and Lilian Jerina V. Galon

Adolescence is a time of transition when habits are formed and persist into adulthood including the choice to be physically active. Good habits, such as regular physical activity (PA) or exercise and a healthy diet, are likely to bring immediate and long-term health benefits. However, a high prevalence (83%) of insufficient PA in Filipino adolescents was reported in the 2018–2019 Expanded National Nutrition Survey. Further, this important stage of life has been long neglected because of the scarcity of public health interventions targeting adolescents.

This study described the PA initiatives, programs and interventions among Filipino adolescents, determined the types of PA of male and female adolescents, and developed the PA intervention tools for Filipino adolescents.

Using the qualitative methods of focus group discussion (FGD) and key informant interview (KII), the adolescents' understanding of the importance and benefits of being physically active as well as the causes and effects of physical inactivity were determined. Perceptions of enabling factors and barriers to PA at the individual level and on their immediate environment; preferences and attitudes

towards PA engagement; and awareness on past and current efforts to address physical inactivity were also explored.

Results showed that adolescents' understanding of PA can be classified into four: (1) as a form of exercise or sports; (2) as any activity that produces physical movement; (3) as a way to release energy; and (4) relating to physical health and fitness. Factors that affect PA engagement include access to safe facilities and open spaces, related costs or fees when joining PA programs, recognition and incentives, availability of PA programs appropriate for

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**Adolescents' preference towards a specific PA or sports can be influenced by early introduction of these activities by their parents and in school, doing these with their family and friends, and the level of enjoyment they experience during play.**

”







their age group, “*hindi naalok*”, “*nakakawala ng dignidad dahil hindi nakasanayang gawin*” or simply not interested. Adolescents’ preference towards a specific PA or sports can be influenced by early introduction of these activities by their parents and in school, doing them with their family and friends, and the level of enjoyment they experience during the play.

During the COVID-19 pandemic, reasons for non-engagement in sports and exercise were mobility restrictions, heavy academic

load from online classes, limited resources at home, and fear of contracting the virus. It was noted that having an enabling environment and active support from families, and the immediate community facilitates continuous engagement of adolescents in PA at home even throughout the pandemic.

Physical activity programs and activities mentioned were limited only to intramurals or sports fests, sports training programs, and morning dance activities in school. While for the community, sports league organized by the *Sangguniang Kabataan* (SK), town festivity games, and community Zumba were identified. Most of these activities shifted to internet-based modalities during the pandemic.

While this study observed the predominant lack of PA, sports and exercise, as well as engagement of Filipino adolescents prior and during the pandemic period, the role of the family, school, and community as well as policy makers and program planners in establishing and sustaining an active lifestyle among adolescents are underscored and reinforced.

In support of public health efforts in improving PA awareness, the DOST-FNRI through the Move More for Healthier Filipino Teens project initiated the development of information, education, and communication (IEC) materials for Filipino adolescents. The IEC materials present guidelines and a variety of school-based PA that enable adolescents to participate in day-to-day moderate-to vigorous-intensity PA.





# R&D PROGRAM ON FOOD QUALITY AND SAFETY



# DEVELOPMENT OF FOOD REFERENCE MATERIALS ON NUTRITION LABELING FOR USE BY LOCAL TESTING LABORATORIES

Leah C. Dajay, Jolly C. Cotara, Jennifer C. Laurea, Mylene B. Martin, Maricar Giel Y. Parcarey, and Prudencio E. Adona

Reference materials (RMs) provide the best information on the quality and traceability of testing results to a fundamental standard. Traceability is commonly offered by certified reference materials (CRMs) with property values certified by an established procedure under accurate metrological traceability. However, local testing laboratories fail to use CRM in their analysis due to high cost. Instead, secondary RMs can serve as the most suitable quality control test material. Further, RM producers accredited to ISO/IEC 17034:2016 can assure customers that they are provided with the most reliable and high quality RMs.

The third phase of the project focuses on the implementation of the established ISO 17034:2016 Quality Management System in the development of rice flour RM based on interlaboratory comparison. The candidate



**“Reference materials developed by FNRI-RMP give confidence to local testing laboratories in assessing the quality of their measurement results”**

RM was prepared from commercial rice mixed with iron and zinc fortificants, then pulverized and homogenized. Homogeneity of the RM was established following ISO Guide 35:2017.

Twenty (20) collaborating laboratories participated in the interlaboratory comparison to characterize the property values of the candidate spiked rice flour RM.

The property values of the spiked rice flour RM, derived as the mean from ANOVA of laboratories' result, and expanded

uncertainty, derived from the standard uncertainty associated with between-unit variability, short-term and long-term stability, and characterization of the property value of the RM, are shown in Table 1:

Continuous analysis of selected measurands by credible subcontractor is conducted periodically to monitor stability. Along with the development of RM, document review, internal audit, and management review of the FNRI ISO/IEC 17034:2016 Quality Management System were conducted to ensure effective implementation during the development of RMs.



Measurand	Property value	Expanded Uncertainty (coverage factor, k=2 @ 95% confidence level)
Moisture, g/100g	9.67	± 1.12
Protein, g/100g	7.06	± 0.44
Ash, g/100g	0.37	± 0.12
Potassium, mg/100g	64.03	± 8.67
Zinc, mg/100g	6.40	± 0.81

Table 1. **Property Values and Expanded Uncertainty for Spiked Rice Flour RM**





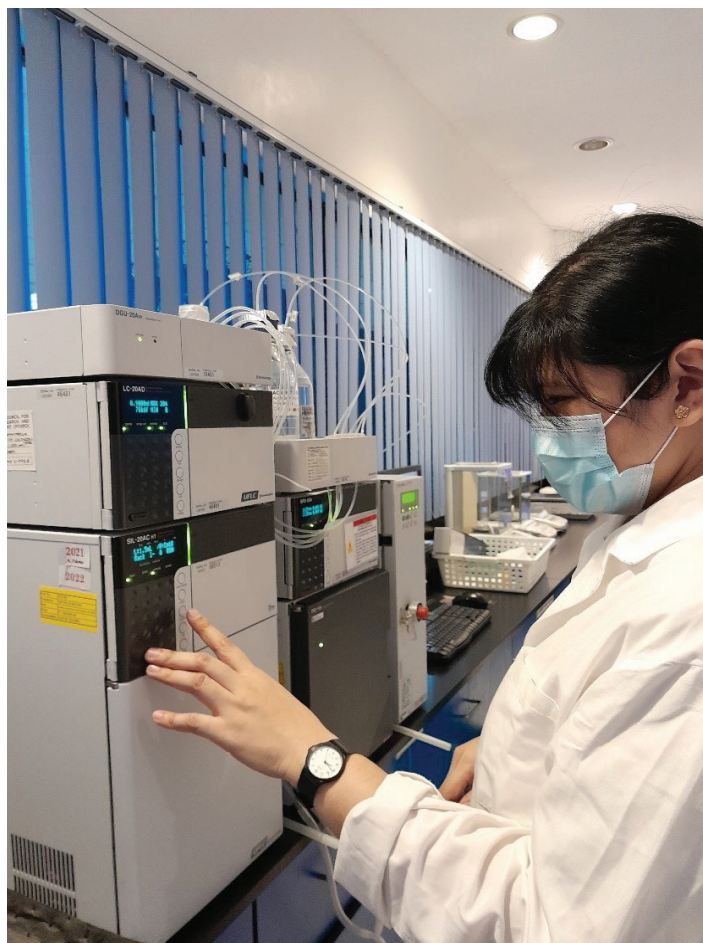
# AMINO ACID CONTENT IN SELECTED COMMONLY CONSUMED FOODS IN THE PHILIPPINES

Kristine B. Nacionales, Regina G. Rodriguez, Alexandra Lyne E. David, Ma. Teresa J. Soriano, Ma. Ariza C. Baylosis, Aries G. Lundag, and Ireneo G. Lundag



According to the World Health Organization (WHO), amino acids are mainly obtained from proteins in the diet. And the quality of dietary protein is assessed from essential to non-essential amino acid ratio. Inadequacy in the uptake of these essential amino acids leads to a number of diseases and are associated with other health issues. This justifies the need for quality amino acid data. At present, there is no available in-house method for amino acid determination. Additionally, the amino acid data of most Philippine foods are missing or have not been recently updated. Thus, the study aimed to determine the amino acids composition of commonly consumed foods in the Philippines using a validated analytical method.

The generated amino acids data present in commonly consumed foods were obtained from careful sample preparation approach and the application of optimized and validated method for sample

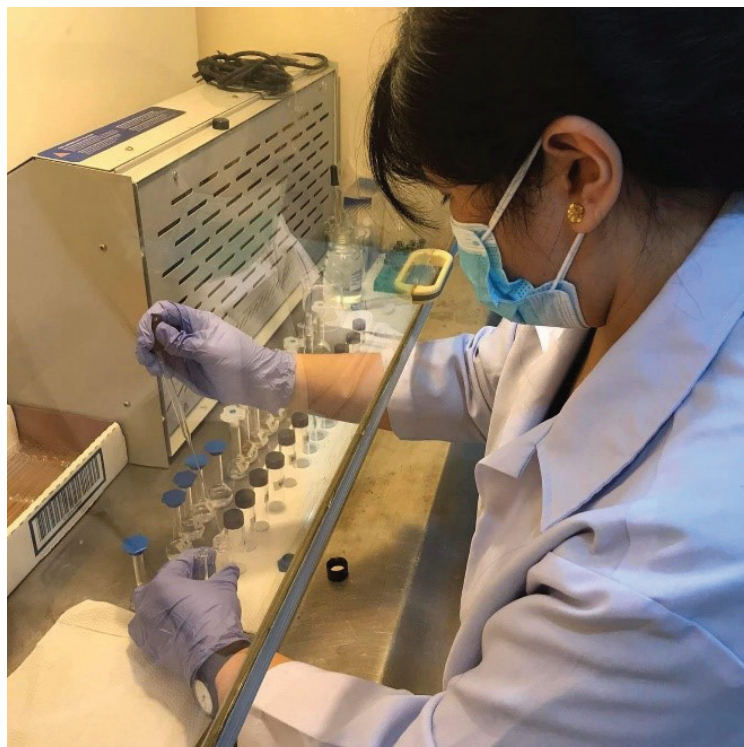




extraction, sample derivatization, and high-performance liquid chromatography (HPLC) analysis for quantification of results.

The validated method determined the fifteen amino acids (aspartic acid, glutamic acid, serine, glycine, histidine, arginine, threonine, alanine, proline, tyrosine, valine, isoleucine, leucine, phenylalanine, and lysine) in foods that can be extracted using acid hydrolysis and quantified using HPLC with UV detector.

The results were all satisfactory with regards to sensitivity, accuracy, precision, and comparability with the acceptance criteria based on Eurachem guidelines. Hence, the developed methods, both derivatization and HPLC method, provided a reliable approach to overcome many of the drawbacks that occur with the conventional amino acid standard methods. The generated amino acid data of the Food Composition Team will be useful in determining the excessive or deficient intakes of these components, clinical nutrition for dietary counselling, and provide basis for development of food products.



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# PROFICIENCY TESTING PROVISION AND DEVELOPMENT OF QUALITY CONTROL MATERIAL FOR TESTING OF FOOD QUALITY AND SAFETY

Leah C. Dajay, Jolly C. Cotara, Mylene B. Martin, Jennifer C. Laurea,  
Prudencio E. Adona, Jr., Maricar Giel Y. Parcarey



Proficiency testing (PT) is an independent assessment of the laboratories' technical performance in conducting specific test evaluated against pre-established criteria by interlaboratory comparison. The DOST-FNRI, as the only accredited PT provider in the country, continually provides quality, affordable, and reliable PT schemes for nutrition labeling parameters and reference materials (RMs) for quality control purposes. This assists the Philippine testing laboratories in achieving quality assurance

on the results they are generating.

PT rounds on the following were conducted to registered participating laboratories:

- A. FNRI PT 22-01 (corn-based snack foods) for the analysis of proximates (moisture, fat, protein, and ash), total dietary fiber, minerals (iron, calcium, sodium, potassium, and zinc), and saturated fatty acids;
- B. FNRI PT 22-02 (fruit drink) for the analysis of total sugar, vitamin C, and pH;
- C. FNRI PT 22-03 (milk powder) for the analysis of proximates (moisture, fat, protein, and ash) and minerals (iron, calcium, sodium, potassium, and zinc); and
- D. FNRI PT 22-04 (fortified rice-monggo blend) for the analysis of proximates (moisture, fat, protein, and ash), minerals (iron, calcium, potassium, zinc, and magnesium).

The FNRI PT 22-01 and FNRI PT 22-02 were both participated in by 17 local testing laboratories, while FNRI PT 22-03 and FNRI PT 22-04 were participated in by 20 and 14 local testing laboratories, respectively.

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**PT is not about the performance score, it is about learning from the result.**

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The assigned values for all the measurands included in the four (4) PT rounds were established based on the consensus values of PT participants' results. The laboratories' performance was evaluated based on z or z' scores, depending on the suitability of the consensus values.

Upon statistical evaluation, majority of the participants obtained "Satisfactory" (S) performance ( $|z \text{ or } z' \text{ score}| \leq 2.00$ ) in four PT Rounds, as shown in Table 1:

No performance score was issued for saturated fatty acids due to limitation of data for analysis. Participants who did not obtain "Satisfactory" performance were encouraged to conduct self-investigation and corrective actions to improve their laboratory performance.

The surplus proficiency test items (except for fruit drink) with established assigned values were continuously monitored for stability and are offered to testing laboratories as secondary reference materials for quality control purposes, together with other RMs generated from the previous years that are still found suitable for use. These include lyophilized fish muscle, corn-based snack food, infant formula, spiked rice flour, powdered concentrate, ground nuts, and processed meat.



Analyte	% Satisfactory performance for FNRI PT 22-01	% Satisfactory performance for FNRI PT 22-02	% Satisfactory performance for FNRI PT 22-03	% Satisfactory performance for FNRI PT 22-04
Moisture	93	-	89	100
Fat	92	-	53	71
Protein	69	-	100	100
Ash	85	-	88	90
Total dietary fiber	80			-
Calcium	75	-	82	67
Iron	88	-	55	63
Sodium	75	-	75	-
Potassium		-	91	88
Zinc	100	-	80	86
Magnesium	-	-	-	83
Total Sugar	-	73	-	-
Vitamin C	-	90	-	-
pH	-	100	-	-



# DEVELOPMENT OF FOOD SAFETY GUIDELINES FOR THE FOOD SERVICE SECTORS

Trinidad Il T. Arcangel, Vannizsa I. Ramas, Czarlyn April Joy G. Mendoza, John Lester G. Ramirez, Pamela Mildred G. Rosales, Milfred P. Paccarnas, Mario V. Capanzana, PhD., Rosemarie G. Garcia, Marcela C. Saies, and Roxan Marie J. Francisco

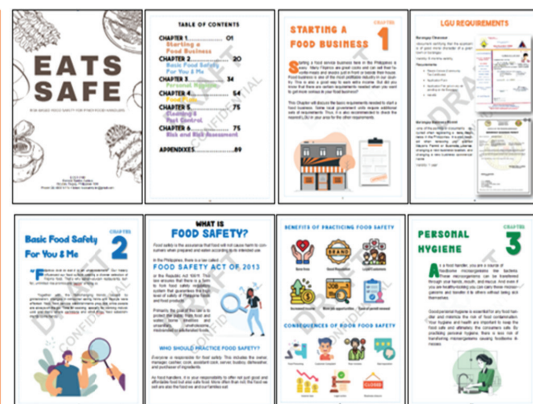
Food safety is a critical issue in the Philippines. This affects the health and well-being of the population, as well as greatly impacts on the country's economic growth and development. Ensuring public health and safety is one of the government's priorities. Unfortunately, in spite of these efforts, foodborne illnesses are still a common concern in the country that often lead to hospitalization and death. Thus, it is essential to take necessary precautions to prevent the spread of these illnesses by implementing strict food safety regulations and guidelines in ensuring the quality and safety of the food being served to the public.

As an initiative to address the prevalence of foodborne illnesses in the country,

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**The DOST-FNRI developed a risk-based, simple, and comprehensive guide to help food establishments conform to set standards of existing Philippine laws on food safety in support to the Food Safety Program of the country in addressing the prevalence of foodborne illnesses.**

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the DOST-FNRI developed a risk-based, simple, and comprehensive guide to help food establishments conform to the set standards of existing Philippine laws on food safety.

The team conducted food safety surveys in three highly-urbanized cities of Baguio, Tacloban, and Cagayan de Oro. The survey assessed the knowledge, attitude, and practices of food handlers, and gauged the current food safety culture and compliance of food establishments to food safety regulations. Samples were also submitted for microbiological assessment to check the safety of the food and water from different establishments. Verification of effective sanitation was done to determine the cleanliness of the facilities and utensils used for food preparation. After evaluating the results gathered from food safety surveys, the team drafted a risk-based Food Safety Guidelines that can help food handlers improve food safety practices.

Based on the results, 68% of food handlers achieved medium to high scores on the knowledge test of the food safety survey. This shows that the majority of the participants are knowledgeable

about food safety. However, they fell short in the applications of food safety in their respective establishments. This can be validated from the results of the microbiological assessment of food samples and sanitation verification using an Adenosine Triphosphate or ATP Luminometer kit. There were food samples that tested positive in certain microbiological parameters and majority of the sampling points for the sanitation verification failed within the set limits. This reflects some current practices that need to be addressed. It is recommended that consistent monitoring and training of food handlers be done in order to inculcate the importance of food safety among these food handlers.



After evaluating the results gathered from food safety surveys, the team drafted a risk-based Food Safety Guidelines. This can help food handlers improve their current food safety practices and shift to a proactive, risk-based approach in implementing food safety regulations in their establishments. This guide is composed of colored texts and images to encourage readers to learn more about food safety in an interesting and exciting way. During the pretesting of the manual, the participants agreed that this will be beneficial to food handlers. Some also suggested incorporating the information gathered in easy-to-read materials, such as flyers, pamphlets, and booklets. Overall, the participants gave the Food Safety Guidelines an average score of “4”, which is equivalent to “Very Good”. It is also recommended that further pilot testing be done to validate the pretesting results for it be more useful to its intended users.





# DEVELOPMENT OF LOW-HEAT AND LOW-HUMIDITY (LH)<sup>2</sup> DRYING SYSTEM FOR THE DOST-MALNUTRITION REDUCTION PROGRAM (DOST-MRP) FACILITIES

Engr. Charlie E. Adona, Richard L. Alcaraz, Engr. Eugenio M. Ramirez, Carissa T. Saldaña, Filoteo D. Ponte, Herlyn A. Villamento, and Mac Joseph B. Rosales



“  
(LH)<sup>2</sup>-dried products:  
dehydrated to  
perfection for better  
nutrition.”

In the Philippines where natural calamities like typhoons, earthquakes, or volcanic eruptions often strike, affected residents flee to evacuation centers for protection. The nutritional value of relief goods is a concern for the evacuees' health in these circumstances. Rice, sardines, canned meat, and coffee are the items in family food pack. Although these emergency supplies in the shelters, which are mostly composed of carbohydrates and protein can satisfy human energy needs, these are not nutrient-rich enough for prolonged evacuation.

Utilizing locally-accessible raw materials for the production of relief goods could drastically reduce costs due to reduced transportation expenses. Fruits and vegetables cultivated close to disaster-prone locations can be utilized as economical and nutrient-rich food supply. Purchasing over-abundant fruits and vegetables would also benefit farmers, as

their harvests would not go unsold owing to the lack of demand and over-supply.

Since the finished goods from vegetables and fruits are nutritious, they can also be included in the government's free feeding program in public schools. Thus, the project designed a new drying system: the Low-Heat, Low-Humidity (LH)<sup>2</sup> method, which can dry at a lower operating temperature, thereby retaining much of the vitamins that are usually thermally degraded using conventional drying system in developing a dried Ready-to-Eat (RTE) product. This technology could encourage school children in eating more fruits and vegetables, as well as help solve the low intake of fruits and vegetables by other population groups.

Designing the (LH)<sup>2</sup> drying system uses several engineering software tools, like the Autodesk AutoCAD™, Dassault Systems SolidWorks™, COMSOL Multiphysics, and



**Remodeled LPG/(LH)<sup>2</sup> Drying Equipment  
installed in DOST- FNRI**

The two (2) products developed using the (LH)<sup>2</sup> drying system are the RTE dried fruit mix and the instant dried vegetable mix. The RTE dried fruit mix is a perfectly balanced blend of pineapple, mango, and papaya. It can be served as a snack food and each 40-gram (g) serving can provide 102 kilocalories (kcal) of energy and 72.86 milligrams (mg) of Vitamin C. The instant dried vegetable mix is a blend of dried cabbage, carrots, and red bell pepper. It is a perfect complement to instant noodles to improve overall taste and nutritional value. Each 30g serving of the instant vegetable mix can provide 102kcal of energy and 14mg of Beta carotene.



**Fabricated (LH)<sup>2</sup> Drying Equipment  
installed in DOST-FNRI**

The projected break-even cost of producing a single pack of (LH)<sup>2</sup> RTE fruit mix is around Php 92.21. A 30% price markup would entail a price of approximately Php 119.87 per pack, giving the overall project a net present value (NPV) of Php 259,402.75 and a return of investment (ROI) at 28.06%, implying a payback period of just 2.62 years. Similarly, profitability projections for the (LH)<sup>2</sup> veggie mix is estimated to have a 30% mark-up price of Php 6.54, with an ROI of 28.34%, and a payback period of 2.60 years. Investment for each product does not exceed 2.4 million pesos, which mainly targets existing Malnutrition Reduction Program (MRP) facilities.



**Optimized (LH)<sup>2</sup> Drying Equipment installed  
in Sigla MRP Facility Calatagan, Batangas**

This study provides valuable quality and safety data on the developed (LH)<sup>2</sup> RTE fruit mix, which showed a stable shelf-life of three (3) months, while the (LH)<sup>2</sup> veggie mix was measured to be shelf-stable for up to four months. The relatively long shelf-life make them suitable for disaster responses, as well as for people who are always on the go. All raw materials are locally produced, so sourcing will be a minimal concern to potential DOST-FNRI technology licensees.

MATLAB. The designing process was optimized using computer simulations of CAD schematics, as well as performance testing after fabrication. Overall, three (3) units were developed and fabricated. The third and final model was installed at Enrique Zobel Foundation, Inc. in Calatagan, Batangas – a DOST-FNRI complementary food licensee.







# **R&D PROGRAM ON DEVELOPMENT OF TOOLS AND GUIDELINES**

# THE PHILIPPINE NUTRIENT PROFILE MODEL

Michael E. Serafico, Carl Vincent D. Cabanilla, Divorah V. Aguila, Kristine B. Nacionales, Robby Carlo A. Tan, Asuncion C. Torres, Charity D. Balucas, Tricia Camille A. Naniong, and Mario V. Capanzana, Ph.D.

Diet is considered a modifiable risk factor for non-communicable diseases (NCDs) and is extremely important in understanding the etiology of most NCDs. Filipinos who have high risk to NCDs showed consumption patterns with high intakes of food loaded with sugar, salt and fat, eating between meals, along with sedentary lifestyle. Collectively, evidences support the need to promote consumption of freshly-prepared dishes; whole foods, like grains, fruits and vegetables; unprocessed or minimally-processed foods; non-alcoholic beverages; and discourage the consumption of processed foods.

The Philippine Nutrient Profile Model (PhNPM) is a guide which sets allowable maximum levels of energy and nutrients of concern, such as fat, sugar, and sodium in a given food item. Existing international NPMs were examined for adoption in the local setting through assessment of food categorization, nutrients of concern considered, and how thresholds were derived.

Consultative meetings with a panel of experts were conducted to discuss issues and solicit recommendations concerning the development of a local model. The panel of experts was composed of nutritionists

and food scientists involved in food and nutrition education and research.

The final proposed model was targeted among children ages 3-12 years old, focusing on the energy, total fat, saturated fat, trans-fat, total sugars, and sodium levels in processed food and non-alcoholic beverage products on a per 100-gram

basis. Maximum allowable levels were set based on the recommended energy intakes of 10-12 years old children (~2000 kilocalories). Some recommendations were taken from the World Health Organization (WHO) Western Pacific Region, Southeast Asian Region, and Choices International models.

Nutrient composition of food products came from actual laboratory analysis or were either borrowed from food composition tables, groceries or food manufacturer's websites. Assessment of commercially-available food products showed that most exceeded the recommended thresholds, particularly on total fat, total sugar, and sodium. Reliability assessment of the PhNPM illustrated that it is in moderate agreement with the WHO, UK and Australia-New Zealand models (%agreement = 85%; Cohen's  $\kappa$  = 0.516).

**The Philippine Nutrient Profile Model (PhNPM) is a guide which sets allowable maximum levels of energy and nutrients of concern, such as fat, sugar, and sodium in a given food item.**





The model can be instrumental to the development of a front-of-pack nutrition labeling system for locally-manufactured food products. It is recommended to

validate the model using more diverse food products and conduct consumer education and dissemination activities on the use of the model.

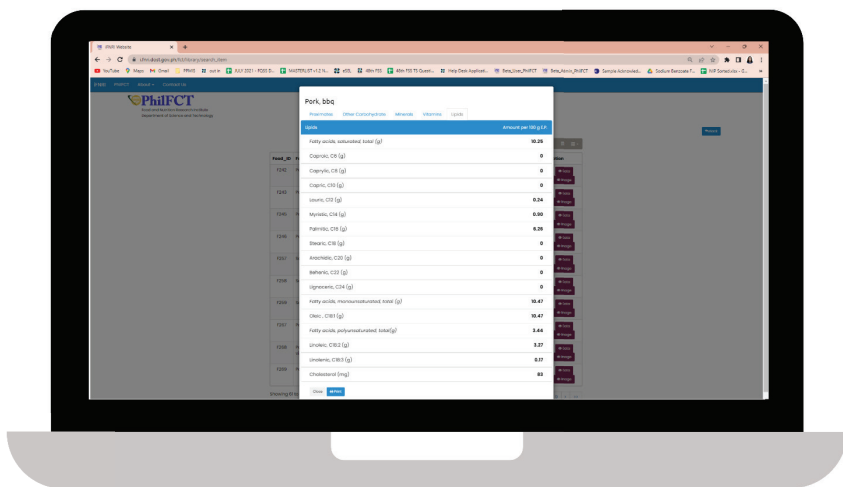
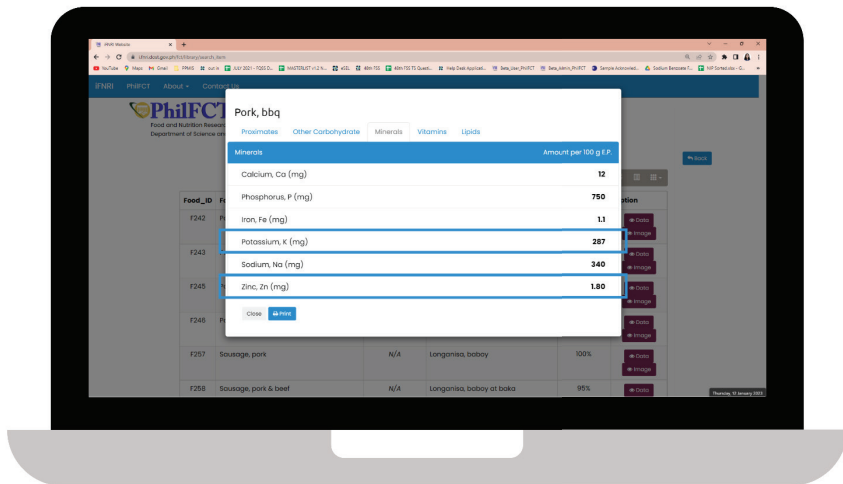


Participants of the consultative meeting (from top row, left to right) Ms. Angelina Miles, Director, Regulatory and Scientific Affairs, Philippine Chamber of Food Manufacturers, Inc.; Mr. Michael Serafico, DOST-FNRI Supervising Science Research Specialist and Project Lead; Ms. Divorah V. Aguila, DOST-FNRI Planning Officer IV; Ms. Tricia Camille Naniong, Project Technical Assistant; Ms. Kristine Nacionales, DOST-FNRI Supervising Science Research Specialist, Food Quality and Safety Section; Dr. Celeste Tanchoco, Country Coordinator, International Life Sciences Institute Southeast Asia Region Philippine Country Committee, former DOST-FNRI Scientist II and Chief Science Research Specialist; Dr. Ernani Bullecer, Professor VI and Chair, Department of Nutrition, College of Public Health, University of the Philippines-Manila; Mr. Robby Carlo Tan, DOST-FNRI Senior Science Research Specialist, Lifestage Nutrition Section; Dr. Demetria Bongga, Professorial Lecturer, University of the Philippines-Diliman; Ms. Asuncion Torres, DOST-FNRI Project Support Staff; Dr. Maria Leonora Francisco, President, Philippine Association of Food Technologists and Certified Food Scientist, and Mr. Carl Vincent Cabanilla, DOST-FNRI Senior Science Research Specialist, Nutrient Requirement Unit.

# UPDATING OF THE PHILIPPINE FOOD COMPOSITION TABLES (PHILFCT®) ONLINE DATABASE AND MOBILE APPLICATION DATA

Kristine B. Nacionales, Regina G. Rodriguez, Alexandra Lyne E. David,  
Ma. Ariza C. Baylosis, and Aries G. Lunday

During this time of COVID-19 pandemic, information and communications technology (ICT) plays a significant role in health, food, and nutrition. Web-based and mobile applications are increasingly being used for health and nutrition awareness, education, and interventions. Responding to this pressing need for technological advances, the DOST-FNRI continuously enhances and updates the Philippine Food Composition Tables (PhilFCT®) online database and mobile application. The PhilFCT® online database and mobile application are the electronic versions of the FCT which store information on the nutritional composition of over 1,500 commonly-consumed foods. The FCT data is used as basis in dietary intake assessments, nutritional research and nutritional



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**Gaps and needs for food composition database updates are associated with the rapidly changing food markets and new nutritional and health interests.**

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epidemiology. It is also used for agricultural research, food formulation, and assessing food biodiversity and food security.

Enhancement and updating of the PhilFCT® mobile application prototype and administrator and users' page of the PhilFCT® online database were done. The PhilFCT® mobile application source code was submitted for copyright application to the Intellectual Property Office of the Philippines (IPOPHL). Continuous checking of the PhilFCT® online database was also conducted to check for possible bugs and errors.







The PhilFCT® mobile application copyright registration was approved on June 15, 2022. A total of 104, 104, 1131, and 79 data on potassium, zinc, fatty acid profile, and niacin from tryptophan were added in the PhilFCT® online database, respectively. This data was also incorporated into the printable food report of individual food item. Continuous checking and enhancement ensures efficient and user-friendly data provision. The online database reached 568,939 hits for the year 2022 alone.

Gaps and needs for food composition database updates are associated with the rapidly changing food markets and new nutritional and health interests. The

updating, enhancement, and maintenance of PhilFCT® mobile application and online database are necessary to meet every user's need and to adapt to the advancement of technology and changing food consumption. In this project, the features and content of the online database and mobile application were reviewed and updated. For future enhancements, ICT developments and the addition of branded food databases are recommended. Furthermore, the PhilFCT® mobile application will be launched in 2023 to disseminate the new nutrition tools and allow these to reach a broad range of users, both local and international.



Republic of the Philippines  
**Department of Science and Technology**  
**FOOD AND NUTRITION RESEARCH INSTITUTE**  
 General Santos Avenue, Bicutan, Taguig City, Philippines



**Food ID:** C024

**Food name and Description:** Lima bean seed, dried

**Scientific name:** *Phaseolus lunatus*

**Alternate/Common name(s):** Patani buto, tuyo

**Edible portion:** 100%

**Proximates** (Food Composition per 100g Edible Portion)

Water (g)	10.2
Energy, calculated (kcal)	348
Protein (g)	19.8
Total Fat (g)	1
Carbohydrate, total (g)	64.9
Ash, total (g)	4.1

**Other Carbohydrate** (Food Composition per 100g Edible Portion)

Fiber, total dietary (g)	19
Sugars, total (g)	8.5

**Minerals** (Food Composition per 100g Edible Portion)

Calcium, Ca (mg)	214
Phosphorus, P (mg)	216
Iron, Fe (mg)	2.4
Sodium, Na (mg)	18

**Vitamins** (Food Composition per 100g Edible Portion)

Retinol, Vitamin A (µg)	0
beta-Carotene (µg)	45
Retinol Activity Equivalent, RAE (µg)	4
Thiamin, Vitamin B1 (mg)	0.24
Riboflavin, Vitamin B2 (mg)	0.12
Niacin (mg)	1.4
Niacin from tryptophan (mg)	0.4
Ascorbic Acid, Vitamin C (mg)	0

**Lipids** (Food Composition per 100g Edible Portion)

Fatty acids, saturated, total (g)	0.23
Fatty acids, monounsaturated, total (g)	0.09
Fatty acids, polyunsaturated, total(g)	0.45

DOST-FNRI. Philippine Food Composition Table Online Database (PhilFCT)  
 Release 1 December 2019 Report Date 01/11/2023 8:44:46

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# WHAT DO OLDER FILIPINOS EAT? – UNDERSTANDING THE DIETARY PATTERNS OF OLDER FILIPINOS FROM NATIONAL NUTRITION SURVEYS

Robby Carlo A. Tan, David Kenneth C. Mendoza, and Kyler Kenn Castilla

## INTRODUCTION

The Philippine Statistics Authority (PSA) reported that older adults 60 years old and above comprised 8.5% or about 9.22 million of the household population in 2020, and is projected to reach 12.8% by 2035. Diet plays a crucial role in the quality of life of older adults. To date no study has been done to understand the dietary patterns of older persons in the country. Thus, this study was undertaken to describe the dietary patterns of older Filipino adults and their associated factors using the 2013 and 2018 National Nutrition Survey datasets.

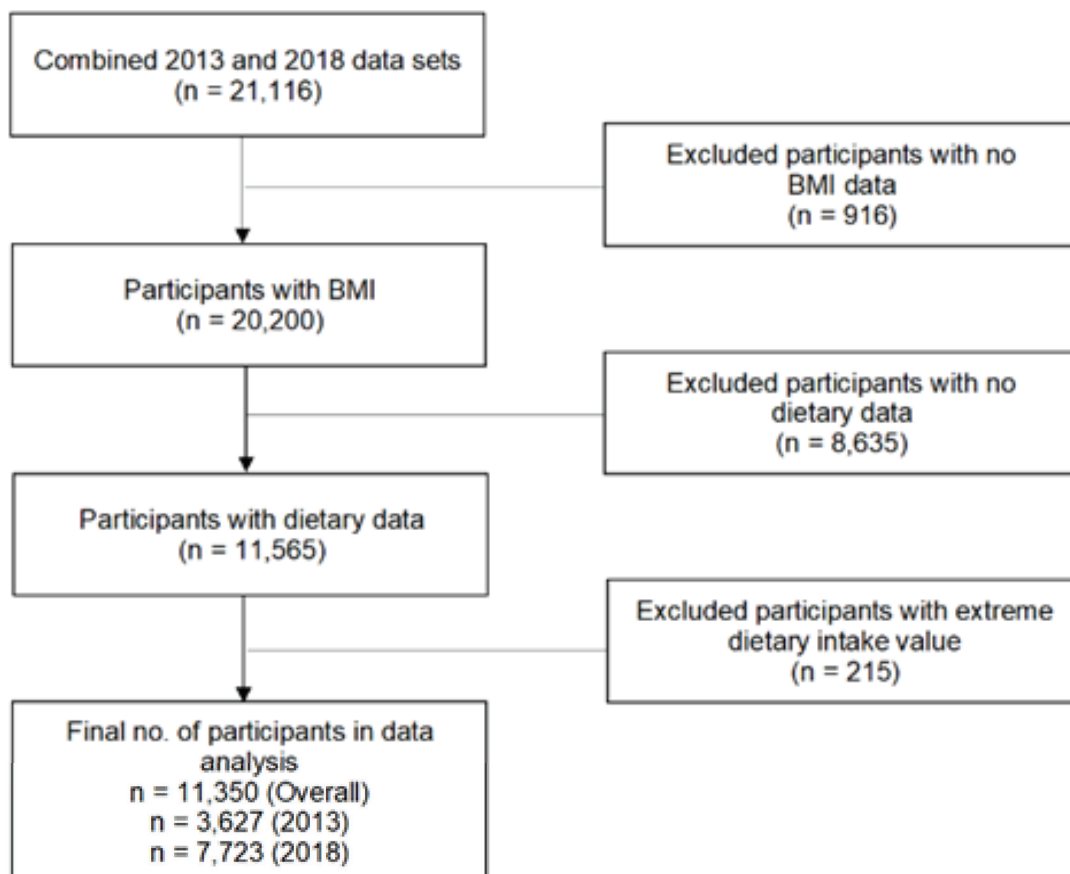
## METHODS

A total of 21,116 older Filipinos 60 years old and above participated in the 2013 and 2018 NNS. After the inclusion and exclusion

criteria, a total of 11,350 were included in the analysis, of which, 3,627 were from the 2013 survey and 7,723 from the 2018 survey (Figure 1).

Dietary patterns were generated using principal component analysis (PCA). The food weights of each item were computed and expressed as continuous variables. Food items were classified into 19 groups based on the existing food guides and cultural and traditional appropriation and use of the food items.

Lastly, the researchers checked the dietary patterns based on local customs and published results from the NNS. Quintiles of adherence to the identified dietary patterns were generated based on the factor loads.





RESULTS AND DISCUSSION

Three similar dietary patterns were identified throughout the NNS years using principal component analysis, with one additional dietary pattern emerging in 2018. The first dietary pattern, described as meat-based and snacking, was composed of red meats, internal organs, poultry, snacks, and beverages. The second dietary pattern or traditional was characterized by high loading on rice and rice-based products and fresh fish or seafood. Third pattern, labeled as plant-based or flexitarian, comprised of roots, tubers, vegetables, fruits, and fats and oils. Lastly, the other staples and dairy pattern had positive loadings on other staples, fruits, and snacks, with negative loading on rice and rice products. Factors that may contribute to dietary patterns were age, sex, body mass index, and socioeconomic status. This was observed in the meat-based dietary pattern.

While studies on Filipino dietary patterns have been conducted recently, these focused on adults 20 years old and older. The present study is the first to explore

Gaps and needs for food composition database updates are associated with the rapidly changing food markets and new nutritional and health interests.

the dietary patterns of older persons and their associated factors. This study may contribute to a better understanding of the diet of older adults to help craft targeted policies and programs for the aging Filipino population. It is recommended to conduct future studies that will check the association of dietary pattern to health outcomes of older persons using advanced statistical analysis and modeling techniques.

2013			2018			
Meat-based and snacking	Traditional	Plant-based	Meat-based and snacking	Traditional	Flexitarian	Other staples and dairy
						
						
						

# OPTIDIETS: OPTIMIZATION OF LOW-COST, NUTRITIONALLY ADEQUATE DIETS FOR FILIPINOS USING A SOFTWARE ANALYSIS TOOL

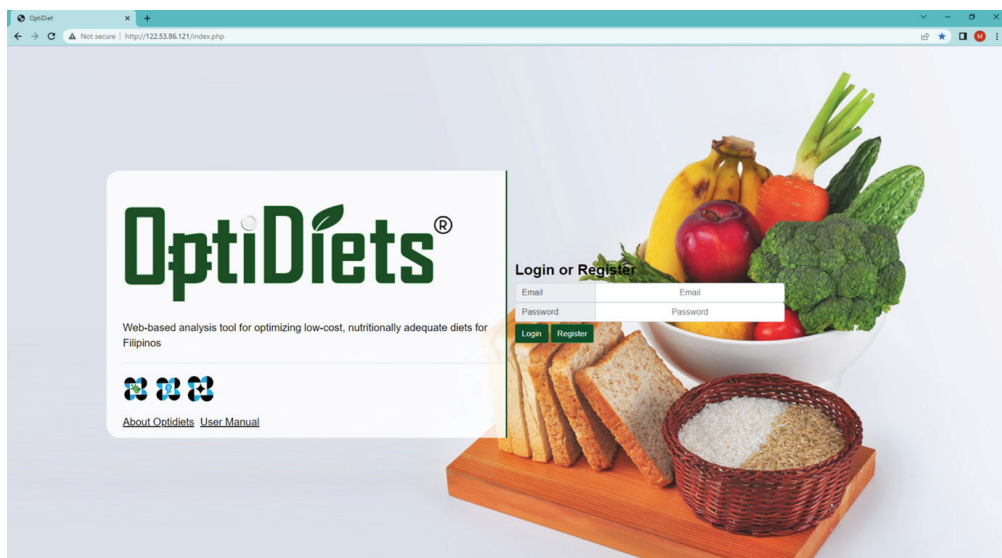
Carl Vincent D. Cabanilla, Robby Carlo A. Tan, Ma. Lilibeth P. Dasco, Ma. Lourdes T. Camagun, Adorie D. Sabenecio, Mardan D. Dionela, Eirene Agustin B. Arnejo, Michael E. Serafico, Charina A. Javier, and Charmaine A. Duante

It is said that household food security depends on two factors: the availability of food and the physical and economic access to sufficient amounts of food. While malnutrition is typically attributed to people's ignorance of dietary guidelines or recommendations, in situations where food is available, the main challenge is usually economic. People may not be able to afford a nutritious and balanced diet, even if they know what foods to eat. The social inequalities at the root of the problem—from the household to the international level—have proven resistant to change, while new factors, such as climate change and food price volatility have emerged to exacerbate the problem.

Against this backdrop, there is a need for mathematical modelling to help calculate the foods which can supply the optimum nutrient recommendations for the least cost, especially for income-strapped households. This information is useful to stakeholders involved in the design of national nutrition policies, action plans, or investment framework.

In the Philippines, advanced methods in dietary computation, such as linear programming(LP) have not been extensively used to help the national government plan its nutrition strategies or social welfare policies. This study brought together LP

technique and country-specific secondary data (Philippine Food Composition Table, Philippine Dietary Reference Intakes, recommended portion sizes from *Pinggang Pinoy*, commonly consumed foods from the National Nutrition Survey database, and updated food costs) to develop low-cost, nutritionally-adequate diets for Filipinos.



The first two years of the study focused on the development of the analytical tool, OptiDiets. During the extension period, the study focused on the validation of software-generated energy-adequate and nutritionally-adequate diets, and the examination of the potential impact of nutrition-specific and nutrition-sensitive interventions on the cost of the recommended diet using OptiDiets.

The pretested OptiDiets® software is now functional and was able to generate regional low-cost, nutritionally-adequate diets. The generated diets have been recipe-tested and visualized. Finally,



the project team has conducted expert consultation on the results of visualization online via the Zoom platform since some of the experts were from other countries.

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The results of the study can be used to estimate the family food budget as input to minimum wage determination per region, and to estimate the food poverty threshold, which is used in conjunction with the non-food component to measure and monitor poverty in the country.

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The analytical tool derived from this study will help improve nutrient intake of Filipino families with limited resources. Moreover, results of the modeling of interventions targeted at vulnerable populations using the software can also create a foundation for policies to expand awareness, reduce cost, and increase availability of nutritious foods. Evidence from this study can be used to inform program design and social and behavior change communication in the fields of nutrition, food security, livelihoods, and social protection. It can also influence policies and advocacy debates on the financial cost of meeting energy and nutrient requirements. In particular, the results of the study can be used to estimate the family food budget as input to minimum wage determination per region, and to estimate the food poverty threshold, which is used in conjunction with the non-food component to measure and monitor poverty in the country.

The screenshot displays the OptiDiets web application interface. The browser address bar shows the URL: <http://122.53.86.121/assessments.php>. The page header includes the OptiDiets logo and the text "Food and Nutrition Research Institute Department of Science and Technology". Below the header, there are navigation links for "New Assessment" and "Saved Assessments". The main content area is divided into four steps: STEP 1: Food Items, STEP 2: People, STEP 3: Constraints, and STEP 4: Optimization. STEP 1 is currently active, showing a "Select Area" dropdown menu with options for Region, Residence, and ALL. Below this, there is a "Food Selection" section with a search bar and a table of food items. The table has columns for Food ID, Food Name, and Price per 100g. The table lists 15 food items, including Sea Urchin, Wheat Banana & milk Cerelac, Snack foods, Gatas, Chocolat, Salmon, nakalata, Cerelac RP milk, Moby choco crunchy snacks - w/ SPS, Oishi crispy patata w/ potato flavor, w/ SPS, Orange Sunkist, Bulador, dried, Saramulyete, dried, and Tilapia, smoked. A "NEXT STEP" button is visible on the right side of the table. STEP 3 is also visible, showing a "My Food List" section with a search bar and a table of food items. The table has columns for Food ID, Food Name, and Price per 100g. The table lists 15 food items, including Corn grits, white, Corn grits, yellow, Corn on cob, white, Corn on cob, yellow, Cornmeal, yellow, Conmeal, yellow, Job's tears grain, Rice bran, Rice, glutinous, parboiled, flattened, Rice, milled, glutinous, Rice, milled, glutinous, milled w/ water, Rice, undermilled, and Rice, undermilled, glutinous, purple. A "NEXT STEP" button is visible on the right side of the table.

# MAKE FILIPINO MERIENDAS HEALTHIER WITH DOST-FNRI'S SNACKS AND BEVERAGE RECIPES

May Ann D. Gironella, Idelia G. Glorioso, Eirene Agustin B. Arnejo, Veronica Vianca C. Salazar, Shannen Faye Q. Arevalo, Erika Niña C. Bacolod, John Denver M. Cabillon, John Mark M. Villanueva, Christelle Lois T. Bayalas, Ma. Corazon E. Palompo, and Milflor S. Gonzales, Ph.D.



Obesity is a growing public health problem worldwide. In the Philippines, the result of the 2021-2022 Expanded National Nutrition Survey showed that 4 out of 10 Filipino adults are overweight or obese. This problem increases the risk of developing obesity-related diseases such as type 2 diabetes and heart problems.

In the Filipino culture, food brings family and friends together. Filipinos usually eat more than three meals per day. The locals are fond of eating snacks or “merienda” between main meals. Snacks are viewed as additional source of nourishment to fuel the body and beverages are sources of fluids that are important for bodily processes, temperature control, work performance, and aid in digestion. However, energy-dense snacks and beverages can contribute to overweight and obesity. Thus, snack and beverage recipes were developed not only to satisfy the appetite, but also to help improve the quality of the diet consumed by many Filipino adults.

A total of 40 nutritious, easy-to-prepare and affordable recipes were developed, of which 27 are snacks and 13 are beverage recipes. All are inspired by various local

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The development of the tools aims to improve the quality and consumption of local snacks and beverages and move away from energy-dense, high-sugar, high-fat foods. With proper snacking and beverage consumption coupled with healthy lifestyle, it is hoped that these tools will positively influence the perception and food consumption of adults to achieve better health status.

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and international cuisines. The recipes underwent two trials of recipe testing and taste test, and were found to be acceptable in appearance, color, aroma, texture, taste, and overall liking. The snack recipes contain about 220-250 calories, and the beverages provide less than 40 calories, except for drinks with milk. The nutrient content of carbohydrates, protein, and fat were estimated using the Menu Eval Plus software and the percentage contribution of selected micronutrients was determined using the Philippine Daily Reference Intakes (PDRI) of 19-29 years old for males. Sugars were added in minimal amounts and food items that are known to contain functional health benefits, such as antioxidants and

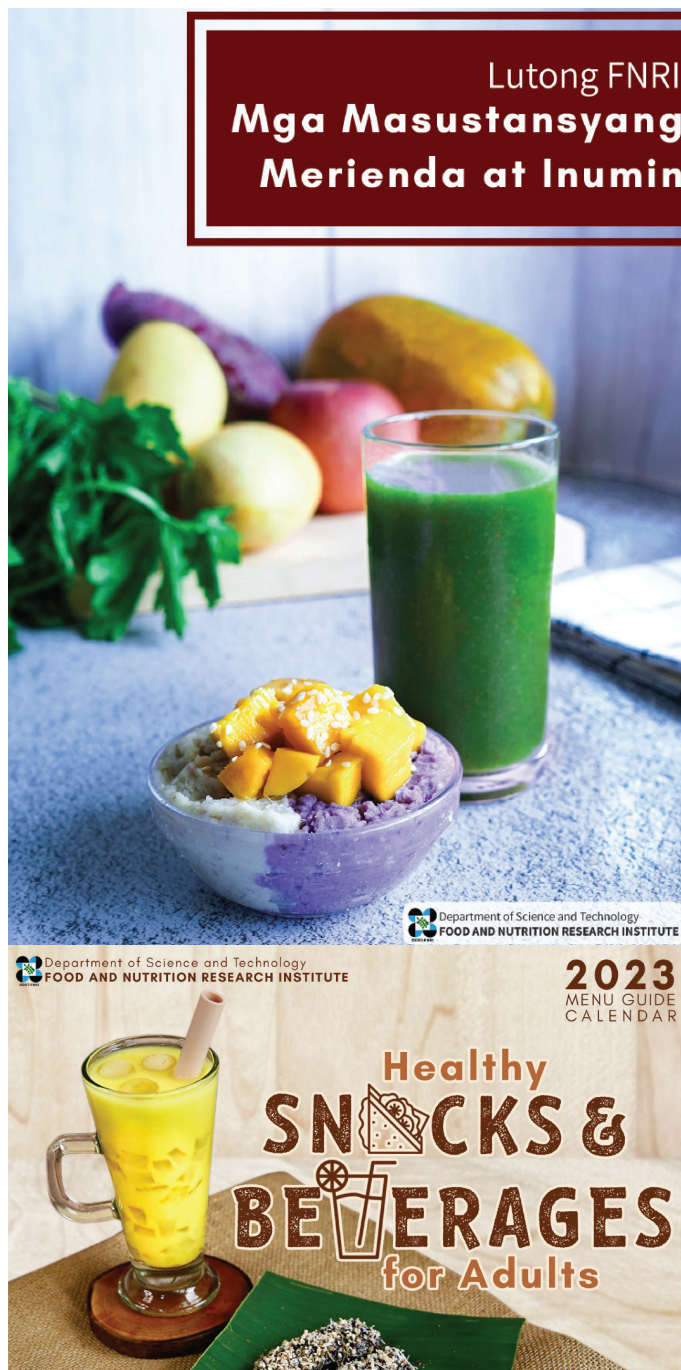




cholesterol-lowering properties were used in the recipes.

Aside from the recipes, nutrition trivia, nutrition infographics, and articles were created to provide information and recommendations for proper diet and healthy lifestyle. These are included in the development of nutrition tools.

The recipes and nutrition messages were featured in three nutrition tools: (1) 2023 DOST-FNRI Menu Guide Calendar, (2) Lutong FNRI recipe booklet and (3) recipe videos dubbed as “eKusina videos”. The Menu Guide Calendar is an annual publication of the Institute. It features 15 snack and beverage recipes with nutrient contents, cost per serving, recipe trivia and 4 weekly, 7-day cycle menus. Nutrition articles are also included, such as guide to in-season fruits in the country, healthy snacking, growing your own food, and simple exercises at home. The recipe booklet branded as “Lutong FNRI” highlights the 40 developed recipes with additional articles on healthy snacking and the importance of hydration. Four (4) eKusina videos were developed and will be uploaded in the DOST-FNRI Facebook page and YouTube channel. These tools underwent two stages of pretesting among experts and target users before finalization. The calendar and recipe booklet will be distributed among allied medical professions, nutritionists, health workers, other partner agencies, and the public. These tools will be uploaded in the DOST-FNRI website for wider reach among audiences including schools,



students, homemakers, and food business owners.

Overall, the development of the tools aims to improve the quality and consumption of local snacks and beverages and move away from energy-dense, high-sugar, high-fat foods. With proper snacking and beverage consumption coupled with healthy lifestyle, it is hoped that these tools will positively influence the perception and food consumption of adults to achieve better health status. Moreover, the recipes developed can also be income-generating options for food business owners.



# IN VITRO MINERAL AVAILABILITY FROM MEALS BASED ON *PINGGANG PINOY*® RECOMMENDATIONS

Ma. Lourdes T. Cumagun, Amster Fei P. Baquiran, Carl Vincent D. Cabanilla, Johanne B. Guilaran, Melissa S. Borlagdan, Adorie D. Sabenecio, Darlah Marcela S. Leonardo, and Mardan D. Dionela

A healthy diet contains macronutrients consumed in appropriate proportions to support energy and physiologic needs without excess intake, while also providing sufficient micronutrients and hydration to meet the body's needs. This is depicted in the Philippine plate-based food guide, *Pinggang Pinoy*®, which shows the recommended proportion of each major food group on a per meal basis. Following the recommended equivalent portion sizes of *Pinggang Pinoy*® may help achieve adequate intake of nutrients across the different population groups and improve food choices.

When planning a diet, it is not only important to attend to the intake of nutrients, but it is also relevant to pay attention to the mechanisms that will lead to optimal nutrient absorption by the body. Bioavailability refers to the proportion of an ingested nutrient that is absorbed and utilized in physiologic processes. There are factors that affect nutrient bioavailability, such as concentration of nutrient, chemical form, nutrient–nutrient interactions, dietary factors, nutrition and health of the individual, nutrient excretory losses, and supplements taken separately from meals. Systemic factors that include age, sex, and physiological state of an individual can also influence absorption and utilization of nutrients. Bioavailability is an important input in establishing nutrient requirements such as iron, calcium, and zinc, which can be determined through in vitro screening methods.

The study explored the estimated iron, calcium, and zinc availability of meals prepared following the recommended



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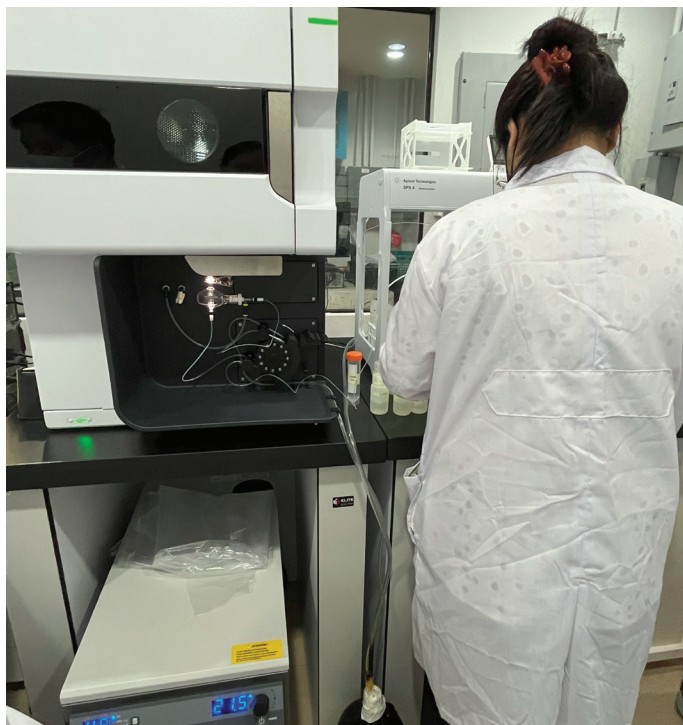




portion sizes of *Pinggang Pinoy*® for different population groups. Six (6) different meals and two (2) snacks were prepared based on the recommended portion sizes for children, adolescents, adults, elderly, and pregnant & lactating women. Inedible food portions, such as bones and fruit peels, were removed. The prepared meals and snacks were homogenized using a

blender and were stored in a -20°C freezer until analysis. The total mineral contents of the samples were analyzed by dry ashing based on AOAC Official Method 985.35 with minor modifications. The meals also underwent in vitro gastrointestinal digestion following the method of Trinidad et al.(1986, 1996, 2002, 2006), in which the human digestive conditions in the stomach and small intestine were simulated. Mineral content of the samples was determined using Inductively Coupled Plasma - Optical Emission Spectrometer (ICP-OES). Phytic acid content of the samples were analyzed using Ultraviolet-Visible (UV-Vis) Spectrophotometer.

The results of the study showed that the composition of meals markedly affected the availability of iron, calcium, and zinc. This was evident in the significant differences between the percent mineral availability of the meals. Findings of this study can provide a basis for the updating of bioavailability factors in the Recommended Nutrient Intakes in the Philippine Dietary Reference Intakes (PDRI), and for the incorporation of bioavailability constraints in the OptiDiets® software, a linear programming tool developed by the DOST-FNRI that can generate nutritionally-adequate diets at the least cost. This can also contribute to evidence-based nutritional programs and interventions, such as food fortification programs because the level of fortificant is based on the level of minerals already available from the diet.





# **R&D PROGRAM ON FOOD PRODUCT INNOVATION**



# PILOT SCALE PRODUCTION AND SHELF-LIFE STUDY OF READY-TO-EAT INSTANT MEAL (INSTANT PORK PICADILLO WITH RTE DRIED FRUIT MIX)

Engr. Jayson G. Tagaroma, Engr. Charlie E. Adona, Engr. Eugenio M. Ramirez, Trinidad II T. Arcangel, Francesca Louise P. Garcia, Herlyn A. Villamento, Filoteo D. Ponte, Jonahver O. Tarlit, and Leonard Villanueva



Instant meal products have become popular for their convenience and accessibility, long shelf-life, and high calorie contents. Natural disasters, such as typhoons, earthquakes, and floods often disrupt access to food and other necessities, making it challenging to provide adequate and timely aid to affected communities. To help address the need for quick and efficient provision of nutritious meals in disaster-affected areas, the “MealLusog” was developed based on the *Pinggang Pinoy*<sup>®</sup> food guide of the DOST-FNRI that emphasizes proper balance of food groups in every meal for optimal nutrition.

This pilot scale study was conducted to fill-in the scale-up gap of laboratory-scale developed products to commercial scale while maintaining its quality and safety. An additional aspect was the financial feasibility study, where the economic viability of a proposed investment is

analyzed in terms of operation design, projected cost, and revenue.

The production of Instant Pork Picadillo with Ready-to-Eat (RTE) Dried Fruit Mix (MealLusog) include grinding, mixing, thermal treatment to inactivate enzymes, and dehydration techniques using the DOST-FNRI low-heat, low-humidity drying system (LH)<sup>2</sup> which limits microorganisms that cause deterioration of products while retaining much of the nutrients. This technology was also used other DOST-FNRI food technologies, such as the Iron-Fortified Rice and the Micronutrient-Growth-Mix 6 or MGM6.

The Instant Pork Picadillo with RTE dried fruit mix (MealLusog) can provide 477 kcal of energy and 25g of protein, which constitutes 19% and 35% of the RENI requirement for a male aged 19-29 years old. Each 129g serving size offers good amount of minerals

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## The healthy fast food: Providing quick and convenient food for improved nutrition through MeaLusog

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including 19mg of calcium, 17mg of iron, and 6mg of zinc. It was tested as shelf-stable for up to five (5) months under normal storage conditions. The moisture content of all ingredients ranged from 2.5% to 10.9%, and 0.17 to 0.62 for water activity. Microbiological tests revealed that it can stable for up to 6 months. The numerical average acceptability rating was 8, which can be interpreted as “Like Very Much” following the 9-point Hedonic Scale. However, at the 5th month of its shelf-life, the sensory attribute “texture” rating declined from a Hedonic

rating of 8 to 7. This drop in sensory score can be attributed to the dried ingredients’ ability to rehydrate.

The projected breakeven cost of producing a single pack of Instant Pork Picadillo Meal with RTE Dried Fruit Mix was estimated to range from 180 to Php 208 per meal. A 30% price markup would entail a price of 234 to Php 270 per meal. The profitability projections are estimated to be 44.02 to 44.76% ROI and a payback period of 1.90 years. Investment can range from 4.0 to 6.6M with production capacities of 2,500 to 5,000 meal packs a month.

This study provided valuable quality and safety data on the developed Instant Pork Picadillo meal with RTE dried fruit mix of the DOST-FNRI which showed a stable shelf-life of five (5) months. The technology is an instant tasty meal designed for higher quality and nutritional value than the average instant meal. Its relatively shelf-stable properties make it suitable for disaster response and for people who are always on the go. All raw materials are locally produced such that material sourcing will be a minimal concern to potential DOST-FNRI technology licensees.





# PILOT SCALE PRODUCTION AND SHELF-LIFE STUDY OF FNRI DEVELOPED PREBIOTIC RICH GRANOLA

Engr. Jayson G. Tagaroma, Engr. Charlie E. Adona, Engr. Eugenio M. Ramirez, Trinidad II T. Arcangel, Francesca Louise P. Garcia, Herlyn A. Villamento, Filoteo D. Ponte, Jonahver O. Tarlit, and Leonard Villanueva

Demand for functional foods has been increasing in recent years, as more people are becoming health-conscious and looking for healthier options. Prebiotics is a type of functional food that has non-digestible food ingredients that promote the growth of beneficial bacteria in the gut. These bacteria can improve overall gut health and help maintain a balanced gut microbiome. Prebiotics are typically fibers and complex carbohydrates that are not broken down by enzymes in the small intestine but are fermented by the beneficial bacteria in the large intestine.

Resistant starch is a type of starch that is not easily digested by enzymes in the small intestine and instead, reaches the large intestine where it acts as a prebiotic. Sweetpotato is a good source of resistant starch that is a commonly grown root crop in the Philippines. Harvest yields approximately 533,000 metric tons per year from 2016 to 2020, according to the Crops Statistics of the Philippines, report in 2020.

The research aimed to further study the scale-up production of Granola, with Sweetpotato starch as the source of prebiotics, a prototype product recently developed by the DOST-FNRI. This pilot scale study developed production techniques for the commercial scale production.



An additional aspect was the financial feasibility study where the economic viability of the proposed investment was comprehensively analyzed in terms of operation design, cost, and returns.

Results of the study showed that a 50g



serving of Granola can provide 240 kcal of energy and 5g of protein. Assay test showed that 16.6g of resistant starch is present per 100g of Sweetpotato starch as ingredient. Shelf-life data revealed that the product is stable up to the 4th month of normal storage. The average sensory acceptability rating was 8, which is equivalent to “Like Very Much”, following the 9-point Hedonic Scale.

The initial investment is estimated to be Php 2.78M, where 56% of the capital budget will be allocated to the procurement of production machinery. Unit breakeven cost of producing a single pack of Granola was estimated at Php 30.29. A 30% price markup would entail a price of Php 39.37 per pack, with a production of around 12,000 packs monthly. The profitability projections are estimated at 43.19% ROI and a payback period of 1.93 years.

The DOST-FNRI developed Granola may be considered a functional food that provides not only the nutritional benefits of traditional Granola but also the added benefits of prebiotics, which can help improve digestion and support a healthy

gut microbiome. However, clinical studies must be conducted to support these health claims. Based on the result of the financial feasibility, the projected unit selling price of 39.37 pesos per 50g pack is competitive to other commercially available Granola products. As it goes for every business undertaking, it is important to ensure that the cost of goods sold is always at a minimum rate to register good profit margins.

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**A DOST-FNRI developed breakfast delight for improved digestion and healthy gut microbiome**

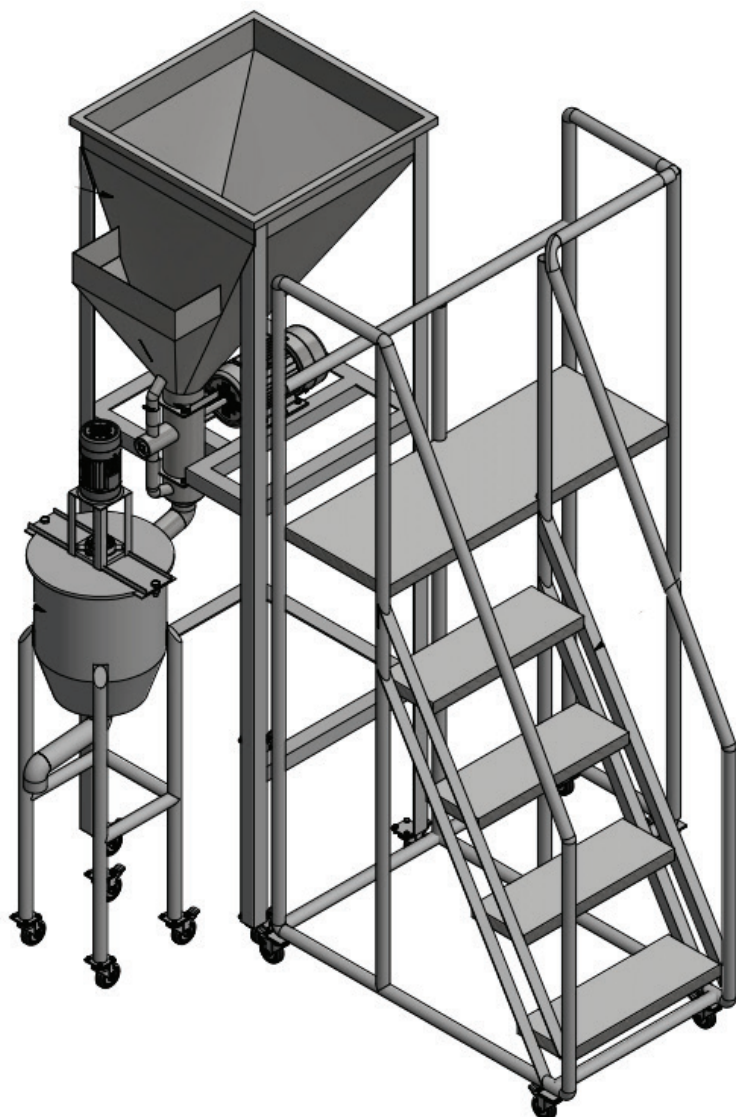
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# PILOT SCALE PRODUCTION AND SHELF-LIFE STUDY OF FNRI-DEVELOPED IRON-FORTIFIED RICE (IFR) USING FABRICATED BLENDING MACHINE

Engr. Charlie E. Adona, Engr. Eugenio M. Ramirez, Engr. Jayson G. Tagaroma, Abbie Padrones, RCh., Francesca Louise P. Garcia, Ana Maximina C. Reyes, Jonahver O. Tarlit, and Filoteo D. Ponte



Iron-fortified rice (IFR) is rice enriched with iron. Iron is an essential mineral vital in the production of hemoglobin, which transports oxygen in the blood. Iron deficiency is still prevalent, particularly in developing countries. Insufficient iron in the diet is the most common cause of iron

deficiency anemia (IDA). IFR can be a good option for those who consume rice as a staple food like in the Philippines. However, it is important to note that too much iron intake can cause health problems as well. Thus, a consistent and safe dosage of this micronutrient must always be met.

Rice blending machines is efficient in mixing different types of rice together, resulting in consistent and uniform blends. The DOST-FNRI developed the IFR blending machine specifically designed to blend ordinary rice with Iron Rice Premix. The equipment's performance was analyzed using process capability analysis, a statistical tool used to assess the capability of a machine or system to perform consistently at a specific point in time. Moreover, the Sigma Level is a statistical measure used to indicate the level of process efficiency or performance. The higher the Sigma Level means the fewer the defects in a process. A financial feasibility study was also conducted to evaluate the viability of commercial adoption.

Results showed that the DOST-FNRI IFR Blending Machine was able to meet the required blending ratio per sack of 0.004 to 0.006 (IFR Premix:Rice). Using process capability analysis, the performance of the IFR blending was estimated to be a little over a three-Sigma ( $3\sigma$ ) Level process, indicating a projection of 3.5% defect rate.

Financial feasibility revealed that a daily production capacity of 16,075 packs at 2 kg per pack has a breakeven unit price of Php 96.16. Using a five-year projection and a 15% markup price, the selling price will be Php 110.58 and the estimated return on investment will be 44.19%. Payback period is 2.37 years with an estimated initial investment of Php 5.62M.

Based on the quantitative indicators, the pilot-scale production of Iron-Fortified Rice using the FNRI blending machine is feasible. Ideal potential adoptors of this blending technology are rice millers, farmers' cooperatives, and other organizations directly associated with rice production and fortification. In this manner, the cost of raw materials needed can be purchased at a lower price, thereby reducing the overall production and blending costs.

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**Iron-fortified rice is rice enriched with iron that is essential in the production of blood hemoglobin. However, too much iron intake can cause health problems such that blending ratio must be consistently met.**

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# PILOT SCALE PRODUCTION AND SHELF LIFE STUDY OF FNRI-DEVELOPED PROTEIN CRACKER USING FABRICATED BLENDING MACHINE

Engr. Charlie E. Adona, Engr. Eugenio M. Ramirez, Engr. Jayson G. Tagaroma, Abbie Padrones, RCh., Francesca Louise P. Garcia, Jonahver O. Tarlit, Filoteo D. Ponte, Ana Maximina C. Reyes, and Rex B. Castante



Substance abuse often leads to deficiencies in essential macro and micronutrients. During recovery, individuals may crave unhealthy foods as a sign of withdrawal (Grotzkyi-Giorgi, 2009). To support recovery, it is important to provide balanced, nutrient-dense meals with sufficient amounts of fruits, vegetables, whole grains, and fish. These foods can help reduce inflammation and provide the necessary nutrients for a healthy diet (Salz, 2014). Hence, developing a technology or product specifically tailored to the nutritional needs of individuals in recovery can be an effective strategy. This should have high levels of protein, antioxidants, fiber, vitamins, and minerals. Responding to the pressing

issue of malnutrition of substance abuse individuals, the DOST-FNRI conducted commercialization and financial feasibility of the FNRI Protein Crackers.

The study involved pilot-testing, commercialization, and financial feasibility of the DOST-FNRI developed Protein Crackers at the DOST-FNRI Nutritional Food Processing Facility using locally and readily available raw materials. The protein crackers were tested for quality in terms of physico-chemical properties, such as water activity, moisture content and color; macro and micronutrient content as to protein content, sodium content; microbiological and sensory evaluation.

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## A DOST- FNRI developed nutritious protein packed snack for substance abuse recovery

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Shelf-life studies of protein crackers were also done. Pilot scale production runs were conducted for process optimization.

As a result of the study, each 60g serving of the DOST-FNRI protein crackers contains 10g of protein, which contributes to 14% of the recommended protein intake per day of males 19 to 29 years old based on PDRI 2015. The physico-chemical characteristics of the product were within their acceptable moisture content of 3.4% and water activity of 0.38. It was found that after sixth (6) month of storage at room temperature (27°C, 61%RH), the protein crackers are within the allowable microbial level. Results also showed that by the end of its shelf life period, a rating of “liked moderately” using the 9-point Hedonic Scale was obtained in the sensory evaluation.

The outcome of the financial feasibility study showed an estimated initial investment of Php 2.15M, where 30% is allocated for the combined procurement of raw and packaging materials and production machinery. A net breakeven

cost of producing a pack of protein crackers was 49.58 pesos. Having a 30% price markup would entail a selling price of Php 64.45 per pack producing around 2,810 packs monthly. The profitability projections are estimated to be 39.16% return of investment and a payback period of 2.08 years.

This food technology can help address macro and micronutrient deficiencies among individuals recovering from substance abuse. Pilot-testing of the DOST-FNRI protein crackers showed that it is macro nutrient-dense food product. This technology is not complex and can be readily adopted by existing bakeries with little to no equipment modification.





# UTILIZATION OF COCONUT-BASED PRODUCTS FOR THE DEVELOPMENT OF A PROTOTYPE VIABLE FUNCTIONAL FOODS

Trinidad II T. Arcangel, John Lester G. Ramirez, Czarlyn April Joy G. Mendoza, Jordan Vincent P. Tiama, and Rolando L. Payag

Functional foods contain one or more nutrients to maintain and enhance health. They may prevent the risk for certain diseases or disorders beyond basic nutritional function (Philippines Functional Food TWG, 2007). Researches show that consumption of functional foods may help prevent non-communicable diseases (NCDs), such as cardiovascular disease, diabetes, and cancer. Thus, the Philippine Technical Working Group on Functional Foods identified priority food commodities for functional food development including coconut.

Coconut is one of the predominant crops in the Philippines. To date, the Philippines



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**Due to its sustainable nature and promising benefits, coconut and its by-products have been utilized in different forms in food. Thus, the DOST-FNRI developed prototypes of a fiber-enriched breakfast cereal and cacao-coconut powdered drink.**

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is the world's second largest producer of coconut products (FAOStat, 2018). Due to its sustainable nature and promising benefits, coconut and its by-products have been utilized in different forms in food. Coconut products are used in previous studies and have shown to provide different health benefits. Apart from its nutritional

content, the dietary fiber from coconut flour is fermentable to short chain fatty acids which is known to reduce the risk of developing gastro-intestinal disorder, cardiovascular diseases and certain cancers (Trinidad et al, 2004). Coconut milk, on the other hand, is



were analyzed in terms of its physico-chemical properties, sensory acceptability using the 9-point Hedonic Scale, and product profiling using quantitative descriptive analysis (QDA). Samples were also submitted for microbial analysis to test the safety of the product for consumption.

Results showed that the moisture content of the samples were comparable

associated with health benefits including antioxidant activity (Saif Alyaqoubi et al, 2015). It contains lauric acid, also present in mother's milk which is associated with promoting brain development (Belewu and Belewu, 2007). Virgin coconut oil, when used as an adjunct supplement to probable and suspected COVID-19 individuals, may help prevent severe symptoms of COVID-19 (Agdeppa et al, 2020).

The DOST-FNRI conducted a study on the prototype development of food products using coconut-based products such as coconut flour and low-fat or light coconut milk. Coconut flour was used for developing fiber-enriched breakfast cereals, while light coconut milk was used to develop a cacao-coconut powdered drink.

The ingredients of the coconut flour-enriched breakfast cereal were optimized using a Central Composite Design (CCD) to give the highest product acceptability. On the other hand, the development of cacao-coconut powdered drink was optimized using mixture design. Standardized samples using the optimized formulation

to commercially available products with values of  $3.73\% \pm 0.31$  and  $5.04\% \pm 0.26$  for coconut flour-enriched breakfast cereals and cacao-coconut powdered drink, respectively. The water activity of the samples was  $0.22 \pm 0.02$  and  $0.35 \pm 0.01$  and were within the safe limits of  $<0.60$  for foods with low moisture content. The acceptability of both samples was rated "like moderately" by DOST-FNRI in-house consumer type panelist. The coconut flour-enriched breakfast cereals can provide 2g dietary fiber per 30g serving size. Microbial analysis showed that values were within the acceptable limits.

To further validate the properties of the food products developed as functional food, it is recommended that in-vitro and efficacy trials be conducted to establish health benefit and health claims. It is further recommended that pilot scale studies be conducted to assess financial feasibility for commercial scale production.







# R&D PROGRAM ON EMERGING DISEASES

# VIRGIN COCONUT OIL (VCO) SUPPLEMENTATION RELIEVES SYMPTOMS AND INFLAMMATION AMONG COVID-19 POSITIVE ADULTS: A SINGLE-BLIND RANDOMIZED TRIAL

Imelda Angeles-Agdeppa, Ph.D., Jacus S. Nacis, Fabian M. Dayrit, MD, and Keith V. Tanda

The coronavirus disease 2019 (COVID-19) is a highly transmissible respiratory disease caused by SARS-CoV-2 virus. It resulted in massive number of deaths worldwide. An important public health strategy against COVID-19 focuses on rapid identification of those who are exposed, quarantine, contact tracing, and early treatment. Along with drug discovery initiatives, the inclusion of an immunomodulatory diet, proper mental support, and adherence to standards are being used to manage COVID-19.

COVID-19 is shown to be primarily dependent on individual immunity. Hence, drugs and traditional medicines with immunomodulatory, antiviral, anti-thrombotic, anti-cytokine and anti-fibrotic

properties are studied for possible use in COVID-19 patients. This was evident in other studies of adjuvant therapies for COVID 19, like Vitamin D, melatonin, and Vitamin C.

Virgin coconut oil (VCO) was found effective in the rapid relief of symptoms and normalization of C-Reactive Protein (CRP) levels among probable and suspected cases of COVID-19. VCO is known to have anti-inflammatory properties, as revealed in earlier studies that have shown its effect as an adjuvant therapy against chronic inflammatory diseases such as asthma. Another study showed that inhalation of VCO diminished airway inflammatory responses. VCO inhalation was effective at alleviating inflammatory responses in

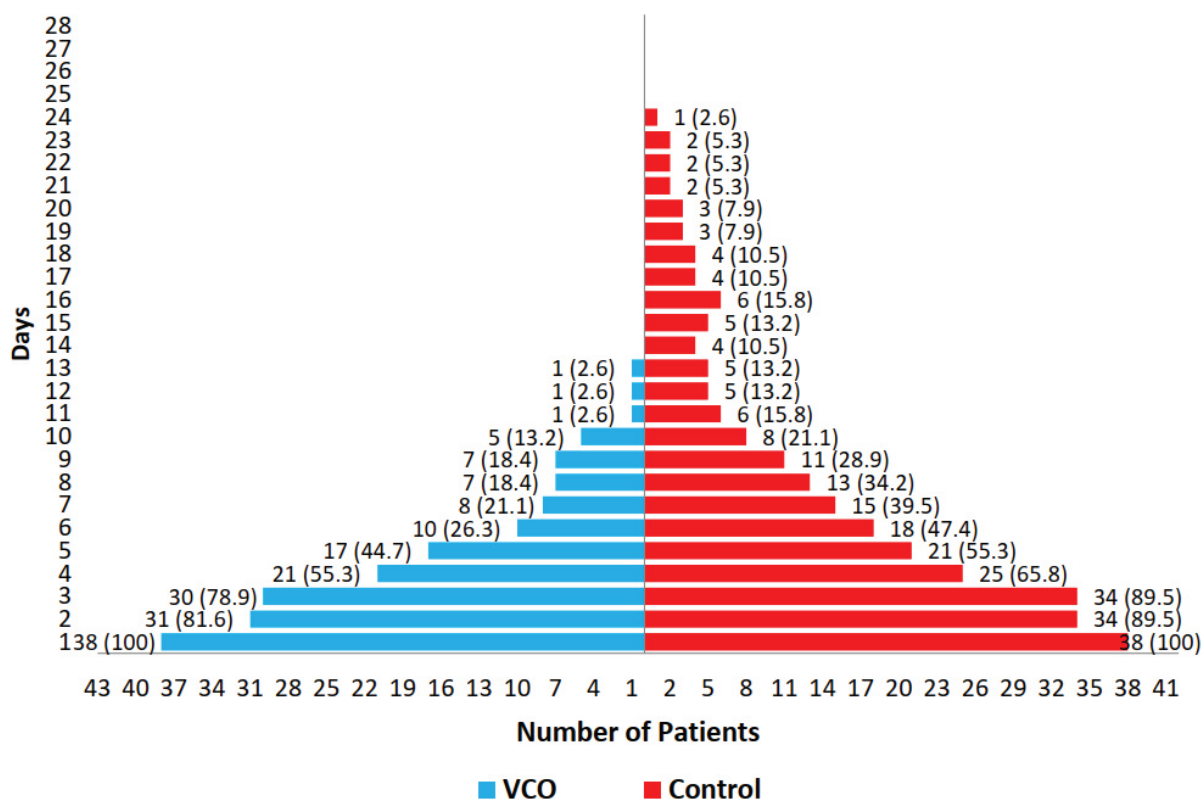


Figure 1. Percentage of participants with diminishing symptoms per group



the airway. A study also concluded that the immunomodulatory property of VCO demonstrated the suppression of cytokines.

A previous VCO clinical trial conducted among suspect and probable cases of COVID-19 showed that VCO promoted faster symptomatic recovery and normalization of CRP levels in comparison with those who did not take VCO as an adjunct therapy. This is a confirmatory study aimed at establishing and evaluating the effects of VCO intake on RT-PCR-confirmed COVID-19 patients with mild to moderate symptoms.

In this study, the VCO group showed more rapid relief from symptoms of COVID-19 and a lower drop in mean CRP levels compared to the control group after 28 days. These results are consistent with the findings in the study conducted among suspect and probable cases in Sta. Rosa, Laguna, where the CRP level of participants in the VCO group normalized by day 14, which is ahead.

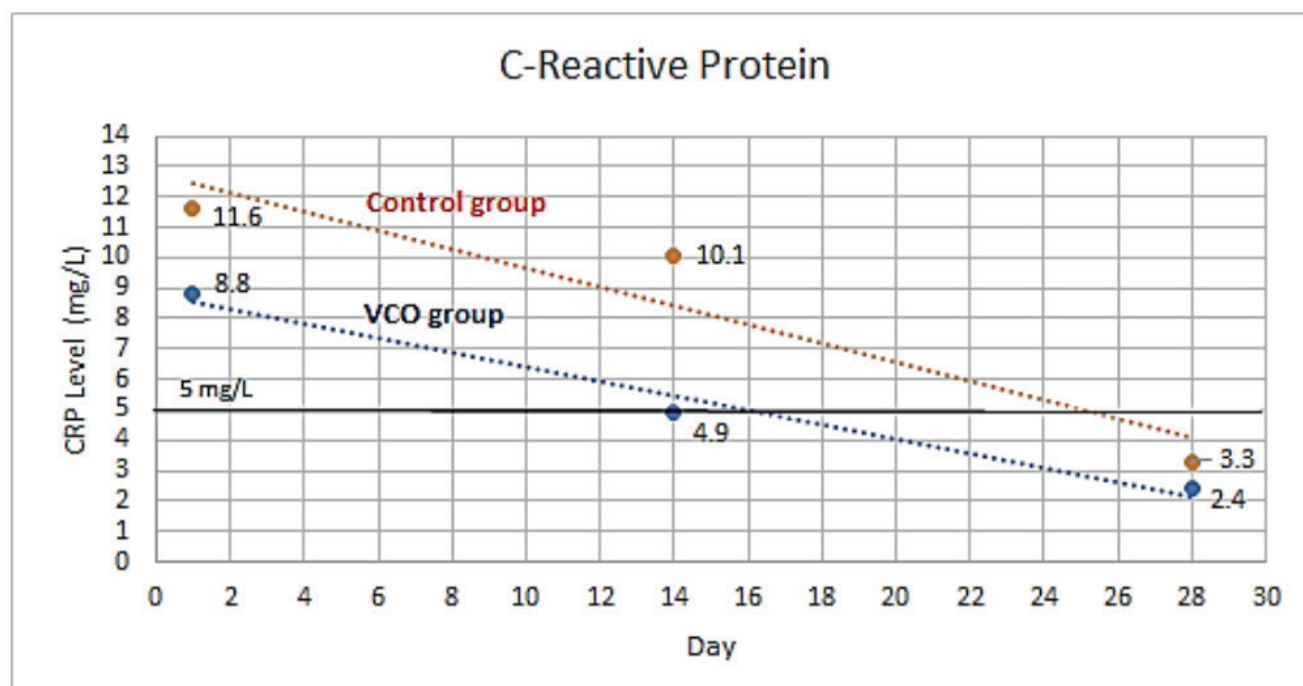
It should also be noted that the first clinical trial was conducted from July to October, 2020 when the predominant variant in the Philippines was the D614G variant (PGC SARS-CoV-2 Bulletin No. 3, 2020). This second clinical trial was conducted from August

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**Regardless of the modality, whether mixed with meals or taken directly before or after meals, VCO is effective as an adjunct therapy against COVID-19.**

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to November, 2021 when the Delta variant was predominant, which demonstrated that VCO showed efficacy against different variants of SARS-CoV-2. Hence, the study confirms that VCO aids in the resolution of symptoms and normalization of CRP levels in mild to moderate cases of COVID-19 compared to the control. Regardless of modality, whether mixed with meals or taken directly before or after meals, VCO is effective as an adjunct therapy against COVID-19.



**Figure 2. Mean C-reactive Protein by Group and Day**



# R&D PROGRAM ON NUTRIGENOMICS



# DIGITAL POLYMERASE CHAIN REACTION FOR TARGETED ANALYSIS OF COPY NUMBER VARIATIONS

Mark Pretzel P. Zumaraga, Frances Isabelle B. Jacalan,  
Marietta P. Rodriguez, and Michael E. Serafico

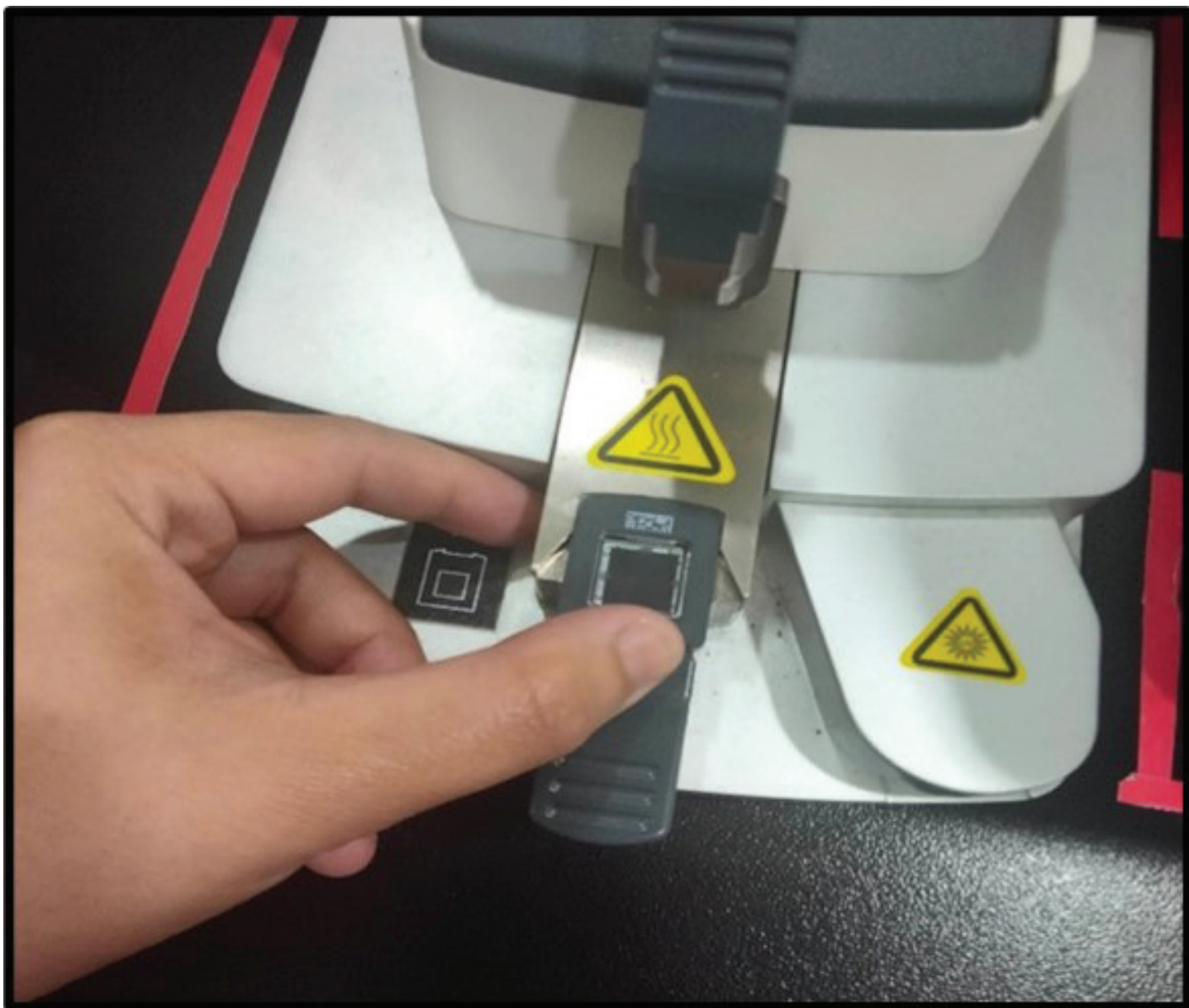
Obesity is associated with premature mortality and is a serious public health threat that accounts for a large proportion of the worldwide non-communicable disease burden. The increase in obesity likely results from a complex interaction between changes in the food environment, physical activity, socioeconomic, environmental, and genetic factors. Obesity is a common multifactorial disorder, and 40–70% of the population variation in Body Mass Index (BMI) is explained by genetic factors. However, the combined effect sizes of single nucleotide polymorphisms (SNPs), the most studied type of genetic variation, identified in genome-wide association studies explain only a minor fraction (~2.7%) of its heritability. Other genetic factors, such as copy number variants (CNVs), can also contribute to its heritability. CNVs are DNA segments that are either deleted or duplicated, and are important constituents of genomic structural variants. The low CNV of the amylase gene (AMY1) has been associated with an increased risk of obesity and varies extensively between different human populations. However, there is no data yet available on the CNV of AMY1 gene in the Filipino population. This study aimed to evaluate AMY1 CNVs of selected participants of the 2018 Expanded National Nutrition Survey (ENNS) using a validated digital Polymerase Chain Reaction (dPCR) method. The method validation was performed initially on certified reference materials (purified samples). Afterwards, the same test material was used as positive DNA control for analysis of actual

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The dPCR is a highly commendable tool that can identify existence of CNVs in a genome which may be related to or which may cause certain lifestyle related disease, such as overweight and obesity.

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samples from selected respondents of 2018 ENNS with available daily rice intake data. Across daily rice dietary intake (tertile), the distribution of AMY1 CNV including factors such as age, BMI, smoking and alcohol status were compared. The dPCR is a highly commendable tool that can identify existence of CNVs in a genome which may be related to or which may cause certain lifestyle related disease, such as overweight and obesity. The method was found to be accurate and precise and successfully applied for analysis of AMY1 CNV. Furthermore, using the validated method, the study showed for the first time, that in this group of Filipinos, there were more overweight/obese participants with high rice intake having low AMY1 CNV compared to participants with normal BMI.



**Figure description:** On the Quant Studio <sup>TM</sup>3D Digital PCR system, the 14.5  $\mu$ L reaction volumes were composed of 2 x Master Mix (Quant Studio 3D digital PCR), TaqMan Assay [primer/probe mix], diluted DNA and nuclease-free water. To reduce the variability caused by pipetting of these small volumes of reaction components onto a microchip, and therefore enables operator consistency & data reproducibility during chip loading, a digital PCR chip loader (shown in the figure) was used in both the certified reference material and extracted DNA of 30 ENNS survey participants.







**R&D PROGRAM ON  
EFFICIENT  
GOVERNANCE:  
SERVICES TO  
INTERNAL AND  
EXTERNAL CLIENTS**

# MAINTAINING AND SUSTAINING THE OPERATIONS OF THE NUTRITIONAL FOOD R&D SECTION'S PHYSICO-CHEMICAL LABORATORY TOWARDS PRC ACCREDITATION FOR AN EFFICIENT FOOD R&D AND S&T SERVICES

Trinidad II T. Arcangel, Abbie L. Padrones, John Lester G. Ramirez, Maricar D. Albao, Bianca Drew Espeño, and Jordan Vincent P. Tama

The DOST-FNRI under Executive Order No. 128 functions to undertake research that will help define the nutritional status of Filipino citizens and develop strategies and programs to fight malnutrition backed with accurate data, correct information, and innovative technologies. Every research and development and science and technology program it initiates ensures excellence and high-quality work among its stakeholders. The Nutritional Food Research and Development Section (NFRDS) of the Nutrition and Food R&D Division (NFRDD) develop food products and technologies that involve physico-chemical analyses. This determines the properties and composition of said food

products. Eventually these food products are transferred to interested Micro, Small and Medium Enterprises (MSMEs). Researchers continuously provide technical assistance and food analysis to technology adopters to ensure that the transferred technologies are within the acceptable values based on specifications set by the Institute.

To support the mission and vision of the institution to provide excellence in R&D and S&T services and become an authorized research and development laboratory duly authorized by the law, the NFRDS-NFRDD developed and implemented strategies for the operation and maintenance of its physico-chemical laboratory in line with





the implementing rules and regulation of RA 10657, otherwise known as the Professional Chemistry Law. Particularly, the laboratory prepared and established the requirements set by the regulatory board such as creation of laboratory safety manual, documentation of profiles and competencies of laboratory workforces. Provision and implementation of safety controls in the laboratory, and implementation of a systematic procedure relevant to waste management, chemical management, and maintenance of laboratory instruments were also undertaken. The laboratory also conducted analyses of food samples from technology adopters to check the quality of the products produced.

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To support the mission and vision of the Institution to provide excellence in R&D and S&T services and become an authorized research and development laboratory duly authorized by the law, the NFRDS-NFRDD developed and implemented strategies for the operation and maintenance of its physico-chemical laboratory in line with the implementing rules and regulation of RA 10657, otherwise known as the Professional Chemistry Law.

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In 2022, a systematic laboratory process flow was maintained and necessary measures for the sustainability of the NFRDS laboratory such as regular calibration, implementation of quality control charting, and initiatives on proficiency testing were continuously implemented. Technical requirements were also followed such as scheduled calibration of laboratory instruments, adequate environment and facilities for chemical storage and conduct of physico-chemical analysis, and implementation of safety controls were maintained.

With the call to centralize all quality management systems on applying certifications and accreditations from accrediting bodies like the Professional Regulation Commission, the NFRDS Physico-chemical laboratory opts to comply with the additional documents needed. Subsequently, to ensure approval of certification, other requirements such as method validation or verification, uncertainty measurements, and other engineering controls such as repair of fume hood and installation of emergency shower and eye wash will be completed.





# **NUTRITIONAL ASSESSMENT AND MONITORING PROGRAM**

## **R&D PROGRAM ON INTERVENTION**



# PROJECT ANAK (ACCELERATED NUTRITION ADVOCACY FOR KIDS): A MODEL DELIVERY SYSTEM FOR COMPLEMENTARY FEEDING AND NUTRITION EDUCATION IN THE COUNTRYSIDE

Julieta B. Dorado, Rowena V. Viajar, Joanne Jette S. Gulay, Emily O. Rongavilla,  
Nesrianne G. Buyco, Georgina S. Caraig, Marie T. Bugas, Ph.D.,  
and Ma. Anna Rita M. Ramirez



This study examined the feasibility of a model delivery system for improving the nutritional status (NS) of 6-23 months old children in 20 implementing municipalities of provinces with high prevalence of undernutrition. The nutrition intervention consisted of CF among infants and young children and nutrition education (NE) among mothers/caregivers using the FNRI-developed complementary foods and modules, respectively.

Project ANAK is a qualitative research that combines the advocacy, capacity building of local community workers for the conduct of nutrition intervention, monitoring and evaluation of program implementation. Face-to-face interviews and remote data collection were conducted among the key informants and mothers/caregivers of children participants. Pre-tested questionnaires were utilized to obtain their profiles and participation in community nutrition program, as well as knowledge of mothers/caregivers on health and nutrition. Sixty-one key informants and 159 mothers-caregivers were interviewed at baseline and endline. Eight hundred twenty-nine children were fed with complementary foods for 60-120 days by the implementing local government units (LGUs). Weights and length/heights of children at baseline and endline were taken and recorded by the community workers.

The delivery of nutrition intervention programs in a community involves a complex process which posed a challenge among implementors on the ground. In the Infant and Young Child Feeding (IYCF), there is a relevant gap in practices specifically on complementary feeding (CF). The need to promote and advocate for complementary feeding was the focus of this research.

The continuity of the intervention was ensured through the commitment of community health workers, active support of the local government officials and the participation of the mothers/caregivers and their children. These were anchored on



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The developed model delivery system on nutrition intervention can be implemented, adopted and sustained in the LGUs provided that the key components are in place.

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the awareness of these key stakeholders on the objectives of the program from the beginning. The presence of an approved local resolution has been the basis for allocating the program budget and its sustainability.

Eighteen local resolutions were passed and approved adopting the intervention. There was a significant decrease in the prevalence of underweight, stunted and thin among participant children and a significant difference between the pre- and post tests knowledge scores of mothers/caregivers. The study revealed that a model delivery system of nutrition intervention can be implemented, adopted and sustained in the LGUs provided that: [1] nutrition and health are in the priority

agenda; [2] there are available and accessible resources, like the presence of nearby Complementary Food Production Facility (CFPF); [3] with advocacy and capacity building of local implementers and orientation of participants prior to implementation; [4] efficient and cooperative local implementers; and, [5] program participants understand, own and cooperate in the program.

The study provided evidence-based model for delivering and implementing local nutrition intervention to achieve the goal of improving the NS of infants and young Filipino children. As revealed in this study, the adoption, implementation and sustainability of a local nutrition intervention has a great potential provided that the key components are in place, steps/elements for implementation are followed, and the involvement of the key stakeholders at the social preparation phase are ensured. The LGUs can pursue the advocacy and promotion of CF of 6-23 months old children and NE of mothers/caregivers as part of the First 1000 Days law and onwards to its implementation. As the LGUs implement this local nutrition intervention, this shall be a contribution to the government's efforts for countryside development and of ensuring inclusive growth where no one is left behind. The model delivery system may be further tested and replicated in future implementation of related intervention programs for the LGUs.





# MADERS' (MOTHERS AND ADOLESCENT GIRLS') MONITORING: KICK-OFF TO THE FIRST 1000 DAYS

Marie T. Bugas, Ph.D., Emily O. Rongavilla, Rowena V. Viajar, Joanne Jette S. Gulay, Julieta B. Dorado, Imelda Angeles-Agdeppa, Ph.D., Ma. Lynell V. Maniego, and Samantha Marie A. Hilomen

The Republic Act 11148 on scaling up the national and local health and nutrition programs through a strengthened integrated strategy for maternal, neonatal, child health and nutrition in the first 1000 days of life, known as the *Kalusugan at Nutrisyon ng Mag-Nanay* Act was signed into law on November 29, 2018. The project MADERS' (Mothers and Adolescent Girls') Monitoring: Kick-off to the First 1000 Days of the DOST-FNRI was conceptualized in response to this law.

The Act indicates that the child's nutritional status and health outcome is the product of pre-conceptual, pre-natal and pregnancy status of the mother, and the first two years of the child's life. It aims to improve the nutritional status of infants and young children from birth to two years old, adolescent females, pregnant and lactating mothers. Thus, it identifies all the services needed for the first 1000 days of life from prenatal check-ups, immunization, micronutrient and dietary supplementation, and provision of other health and nutrition programs and services.

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**Policies that will support the programs and services for the Women of Reproductive Age (WRA) are needed in monitoring the status of pre-conceptual, prenatal and pregnancy status of mothers.**

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Participation to programs and services by women of reproductive age (WRA), 15-49 years old and pregnant mothers is essential towards the journey of healthy and safe pregnancy, childbirth and motherhood as a whole. While micronutrient (iron-folic acid) supplementation among WRA (including adolescent girls) prepares them to healthy pregnancy, maternal monitoring during pregnancy and after childbirth ensures safe pregnancy and delivery as well as proper caring and recuperation after childbirth. Beyond these preparations, a healthy birth outcome is the ultimate target.

Thus, the study identified programs and services at various levels and determined before pregnancy and pregnancy participation of WRA and pregnant mothers to these programs and services.

The project was conducted in the Provinces of Camarines Sur with Iriga City and the Municipality of Lupi; Province of Capiz with Roxas City and the Municipality of Mambusao; and the Province of Sultan Kudarat with Tacurong City and the Municipality of Senator Ninoy Aquino.

Virtual key informant interviews (KIIs) among local health and nutrition program implementers, service providers and other community influencers at various levels in the local government units (LGUs), while in-depth interviews among WRA and pregnant mothers were conducted.

From the program implementation and service delivery, and the participation to these, gaps and enabling factors were identified through adequacy of personnel, allotted budget and available supplies. On the identified problems in availing these services, recommendations on how these can be best implemented were also solicited. Implementation strategies were also asked in the geographically isolated and disadvantaged areas (GIDAs) as well as during the COVID-19 pandemic. Monitoring system was also established.

In addition to the in-depth interviews, pregnancy/children profile were asked including the type and place of delivery assistance, breastfeeding and health-seeking practices. In terms of programs and services for the adolescents, the iron and folic acid supplementation, and for other WRAs and pregnant mothers, the pre- and post-natal services were given emphasis.

The ultimate goal of the study was to recommend for the full implementation of the micronutrient supplementation

among WRA and mandatory maternal monitoring during pregnancy. With providing adolescent girls with iron-folic acid supplementation, they are being prepared for healthy pregnancy when the time comes. With mandatory maternal monitoring, sustaining of having healthy mother and baby during the course of their pregnancy; safe delivery and post-delivery where recuperation of the mother and caring of the newborn is essential are all assured.

With the WRA and the pregnant mothers as the primary beneficiaries of the *Kalusugan at Nutrisyon ng Mag-Nanay Act*, looking at the long term and the picture as a whole, the infants born from these mothers and later the grown-up children benefit the most from the law.





# TRANSLATING RESEARCH RESULTS TO POLICY STATEMENTS: AN EASY ACCESS TO NUTRITION INFORMATION

Marie T. Bugas, Ph.D., Julieta B. Dorado, Emily O. Rongavilla, Rowena V. Viajar,  
Joanne Jette S. Gulay, Georgina S. Carai, Nesrianne G. Buyco,  
and Diana Kathleen F. Villa



Project Results to Policy Recommendations (PR to PR): The Link is a continuing project of the DOST-FNRI that translates completed research results and project outputs into policy statements and recommendations.

There were already 27 developed policy statements uploaded and can be accessed from the DOST-FNRI website under QuickLinks. This year, the project drafted an additional 15 policy statements of varying topics on food, health and nutrition which will later be added to the list in the website for everyone's information.

Based from the recent updating of the Institute's database on citations of DOST, DOST-FNRI and its research and survey data use and adoption in policies and

guidelines, there were already citations in three Republic Acts; 115 Senate Bills/Resolutions; 146 House Bills/Resolutions; and 26 Department/Administrative Orders/Memorandum Circulars/Resolutions.

Since there are new elected and appointed public officials, copies of the policy statements were also provided to 60 national government agencies including various Committee offices in the Senate and in the Congress for their easy reference on their programs and hopefully be included in their legislative agenda.

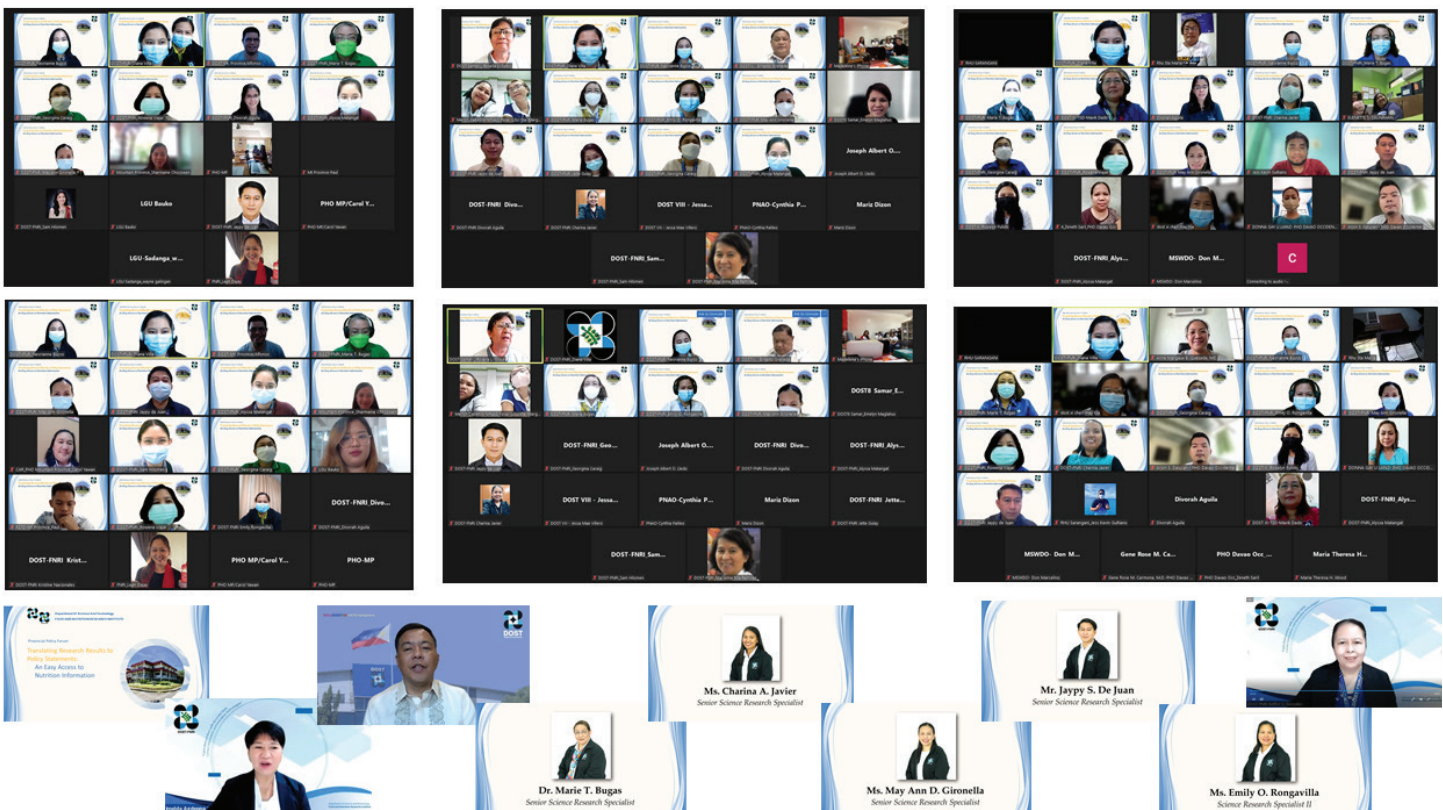
Further to the dissemination of research results including the developed policy statements, three virtual Provincial Policy Fora were conducted in the Mountain

Province, and the Provinces of Samar and Davao Occidental on December 2, 7, and 13, 2022 respectively, with the theme: “Translating Research Results to Policy Statements: An Easy Access to Nutrition Information.” Topics discussed were DOST-FNRI Initiatives on Policy Translation of Research Results; Food Security Status in Mt. Province, Samar and Davao Occidental; Food Safety Grading System Tools; and DOST-FNRI Food Technologies Ready for Transfer and Commercialization. The fora were graced by representatives of the Provincial/City/Municipal Nutrition Committees, DOST Regional and Provincial officers and staff; DOST-FNRI Director and Officer-In-Charge of the Office of Deputy Director and DOST Undersecretary for Regional Operations.

Once again, the aim of having wider dissemination and informing more people

of food, health and nutrition research results translated to policy statements and recommendations was achieved with these initiatives.

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Translating research results to policy statements: an easy access to nutrition information  
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# IN-DEPTH AND CORRELATION STUDIES

# EFFECTS OF LOCAL NUTRITION PROGRAM IMPLEMENTATION ON FOOD SECURITY AND NUTRITIONAL STATUS: CASE STUDY OF BATANES AND AURORA PROVINCE

Charina A. Javier, James Andrei Justin P. Sy, Cheder D. Sumangue, and Ma. Lilibeth P. Dasco

Nutrition intervention has been identified as among the highest return investments available. In the Philippines, the implementation of the Local Government Code in 1991 transferred public health service responsibility to local government units which have high discretion in resource allocation and decision-making for health services, social services, agriculture and environment services and other functions including nutrition.

This study explored the experiences in implementing local nutrition programs in two provinces, namely Batanes and Aurora, and how this affected household food security and stunting among children. These two provinces are distant from the regional centers of commerce but differ in household food security and nutritional status of children. The study used mixed methods that included secondary

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Three themes emerged from the FGD and KIs specifically, involvement of different sectors and community members in programs considered as best practices, nutrition education and communication strategies should include conventional and social media especially during the COVID-19 pandemic, and minimal or lack of cooperation from local officials and community members, and multiple roles of local nutrition action officers remain as challenges.

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analysis of past local nutrition survey data, focus group discussions (FGDs) and key informant interviews (KIIs). Results showed that household size and wealth status

were significant predictors of food security in the two provinces. However, age of the child, educational attainment of head, occupation and presence of overseas worker member were also significant predictors of household food security only in Aurora, and presence of child under-five years old in Batanes. Meanwhile, household wealth was the significant predictor of stunting in both provinces. In addition, child's age and household head occupation were also significant predictors of





stunting in Aurora, and household head education in Batanes.

Three themes emerged from the KIIs and FGDs done in the two provinces. First, involvement of different sectors and community members were considered best practices. This included program like Convergence in Aurora and Bayanihan in various health and nutrition activities in Batanes. Second, nutrition education and communication strategies should include conventional (such as house-to-house visits and local radio program) and social media especially during the COVID-19 pandemic. Third, minimal or lack of cooperation from local officials and community members, and multiple roles of local nutrition action officers were identified as challenges. Low investment for nutrition and uncooperative parents in health and nutrition programs for children were mentioned as hindrances in implementing programs. Provincial/municipal health officers, rural health nurses or midwives who also serve as nutrition action officers and/or population commission officers diminishes focus on nutrition as other tasks need to be done, especially during COVID-19 where doctors and nurses are most needed. The findings offer recommendations such as reviewing the nutrition programs and

services devolved to local government units, implementing rules and regulations of the Nutrition and Dietetics Law of the Philippines and inputs to national and local plan of action for nutrition.



# ANALYSIS OF THE COST OF ONE-DAY FOOD CONSUMPTION OF HOUSEHOLDS MEETING REQUIREMENTS FOR ENERGY AND NUTRIENTS

Ma. Anna Rita M. Ramirez, Charina A. Javier, and Glen Melvin G. Gironella

Food access as one pillar of the food security concept constitute half the domain theorized to underlie the immediate causes of malnutrition in the United Nations Children's Fund (UNICEF) causality model of malnutrition. As such, food access is a critical aspect of food and nutrition security. Economic and physical means underlie individual or household food access. Household "income, expenditure and buying capacity" or purchasing power constitute the economic access to food as physical access lies more on the "infrastructure and facilities" available for the household's use (Philippine Statistical Authority OpenSTAT, n.d.) such as formal and informal markets.

With the end-view of contributing to the conversations on food poverty thresholds and calculations of the cost of food bundles that will satisfy nutrient requirements for a family of five. Food poverty threshold put into context the estimated income that could satisfy nutrient requirements for a family of five.

Using the 2015 Updating Survey of the Nutritional Status of Filipino Children and Other Population Groups Survey conducted by the DOST-FNRI, the study determined the diet diversity of foods consumed by households meeting 100% of requirements

for energy intake (REI) and estimated average requirements (EAR) for nutrients; and computed the cost of foods consumed by households meeting 100% requirements for energy intake and estimated average requirements for nutrients.

Food prices were matched with the 2015 national average prices taken from the Philippine Statistics Authority, the Department of Trade and Industry and the Department of Agriculture. National median food cost was estimated using the 2015 Updating Survey of the DOST-FNRI where prices were based on foods consumed by the households whether these were bought, given to the household, own-produced foods (by the households) and estimated prices of edible foods that were freely caught by the households.

Analysis of nutrient intake were based on the grouping of households based on meeting 100% of requirements, for:

**Group A:** energy only

**Group B:** energy and protein

**Group C:** energy, protein and estimated average requirement (EAR) for iron and vitamin A

**Group D:** energy, protein and EAR for all nutrients (iron, vitamin A, calcium, vitamin C, riboflavin, niacin, thiamine)

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*Magkano ang nutrisyon sa isang pinggang pananghalian?*

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Based on these groupings, the proportion of households is observed to decrease as 100% energy and protein and estimated average requirements for nutrients are met. From 34% of these households to have met 100% of energy requirements, only 2.8% of households were able to provide adequacy for all food sources.

As expected, total food cost was higher among households meeting energy, protein, vitamin A and iron (group C) and households meeting energy, protein and other nutrients (group D) compared to households meeting energy (group A) and households meeting energy and protein only (group B) at PhP 347.10 and PhP 407.60 versus PhP 299.00 and PhP 323.50, respectively. The higher the adequacy of meeting energy, protein requirements and



Percentage of households meeting 100% required energy, protein and/or EAR for nutrients			
	Meeting 100% energy and protein and/or EAR for nutrients	%	SE
A	energy	34.0	0.6
B	energy and protein	27.9	0.6
C	energy and selected nutrients <sup>(a)</sup>	8.0	0.3
D	energy and all nutrients <sup>(b)</sup>	2.8	0.2

SE - standard error

<sup>(a)</sup> protein, iron & vitamin A

<sup>(b)</sup> protein, iron, calcium, vitamin A, vitamin C, thiamine, riboflavin & niacin

EAR for all nutrients, the higher the mean food cost of satisfying these requirements.

### Caveats

While food poverty line (fpl) takes into context the average family income that will satisfy a pre-calculated bundle of goods that satisfies the energy and nutrient requirements for a family of five, the average cost of one-day food

consumption of these families lends another perspective to the “fpl” equation. This borders on the perspective of food expenditure (actual and estimated) with or without the intention of ensuring nutritional needs (by the households) not unless the nuance of food purchasing behavior are examined at the same time, as well as the nuance of “willingness to pay” for food items that could also come into play.



# VALIDATION OF PHYSICAL ACTIVITY, SEDENTARY BEHAVIOR, AND SLEEP (PASS) QUESTIONNAIRE FOR PHILIPPINE NATIONAL NUTRITION SURVEY (NNS)

Chona Patalen, MPH, Maria Stephanie N. Parani, MSc., Jamella Jeanne P. Victa, Agape Joy M. Caro, Catherine M. Iranzo, and Glen Melvin P. Gironella

Non-communicable diseases (NCDs) are the leading cause of death globally (WHO, 2018). In the Philippines, NCDs continue to rise and accounted for more than half (67%) of all deaths in 2016 (WHO NCD Country Profiles, 2018). Various factors contribute to the development of NCDs. Tobacco use, unhealthy diet, physical inactivity, and excessive use of alcohol are the four key risk factors that are responsible for the majority of NCDs. All of these factors are behavioral and largely modifiable.

In the Philippines, physical activity data of Filipinos are collected through the National Nutrition Surveys (NNS) which are regularly done by the DOST-FNRI. The report of the NNS is focused on moderate- to vigorous-intensity levels of physical activity, particularly insufficient physical activity, defined as any person not meeting any of the following criteria: 1) three or more days of vigorous-intensity activity of at least 20 minutes per day; or 2) five or more days of moderate-intensity activity or walking of at least 30 minutes per day (WHO, 2008).

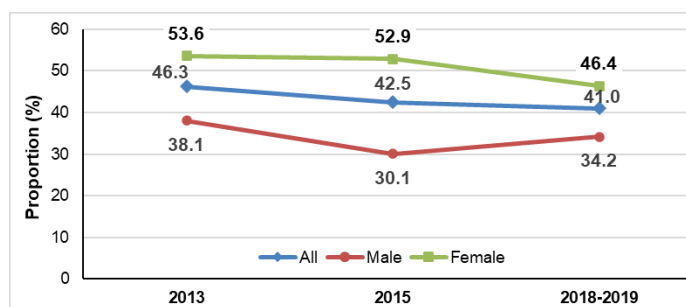


Figure 1. Trend in the proportion of insufficiently physically active adults, 18 years old and above, by sex: Philippines, 2013, 2015, and 2018-2019

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With the aim of providing a coherent and much clearer assessment of how active or inactive Filipino adults are, question items that capture activities spent and the duration in intervals of physical activity (including light-intensity physical activity), sedentary behavior, particularly screen-based sedentary activities, and sleep duration and quality were added to the PASS Questionnaire.

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The percentage of insufficiently physically active adults, 18 years old and above, slightly decreased from 46.3% in 2013 to 42.5% in 2015. By sex, male adults (30.1%) showed a significant decrease in the percentage of insufficiently physically active adults in 2015 (DOST-FNRI, 2016). In 2018-2019, the percentage slightly declined (41.0%) when compared to the 2015 survey result. Nonetheless, it is notable that there was a decline in the percentage of female adults (46.4%) who were physically inactive, while there was an increase in male adults (34.2%) (Figure 1).

Emerging research studies suggest that in addition to insufficient moderate- to vigorous-intensity physical activity, sedentary behavior and inadequate sleep are also important risk factors for chronic disease (Roberts et al. 2017). The NNS have been collecting data for sedentary behavior and sleep duration. However, these indicators were not extensively utilized and integrated as an indicator



framework for physical activity surveillance. Moreover, relevant indicators are needed to provide a comprehensive illustration of the daily activities of Filipinos. Thus, this study was done to develop and validate physical activity, sedentary behavior and sleep (PASS) questionnaire for possible integration into the Philippine NNS.

The PASS questionnaire was envisioned to provide a holistic way of tracking the daily activities of Filipino adults based on a 24-hour cycle. There were 31 items added in the original survey questionnaire to capture activities spent and the duration/time in intervals of physical activity (including light-intensity physical activity), sedentary behavior (like sitting and screen time-based sedentary behavior), and sleep. This will give a coherent and much clearer assessment of how active or inactive Filipino adults are.

The developed PASS questionnaire items were pretested among regular and contractual employees of the Nutritional Assessment and Monitoring Division (NAMD), DOST-FNRI who also gave consent for their participation. This provided an opportunity for the project team to assess if there was confusion about any items in the questionnaire, and to gather suggestions from respondents for the improvement of the questionnaire items. Guided by the Questionnaire Appraisal System (QAS-99), areas that were looked into include difficulty in asking the questions by the interviewer, missing words, phrase or information in the questions, incorrect translation from English to Filipino (and back to English for back translation), inaccurate/incomplete

instructions in the questionnaire, clarity of technical terms used and reference period, difficulty to recall or the need for mental computation, sensitivity/bias, and response categories (multiple interpretations, overlapping response categories, missing response category, or illogical order). The employees were interviewed either face-

to-face or via the Zoom platform depending on their schedules (Figure 2).

After refinement of the questionnaire, the pilot testing was conducted in the provinces of Ifugao, Bohol, and Surigao del Norte among 2021 ENNS participants. All adults, 18 years old and above, both male and female (including pregnant women and elderly 60 years old and above) from the randomly selected households who were willing to participate and have signed the informed consent form for their participation in the 2021 ENNS were included in this study. The pilot testing was conducted from November to December 2021.

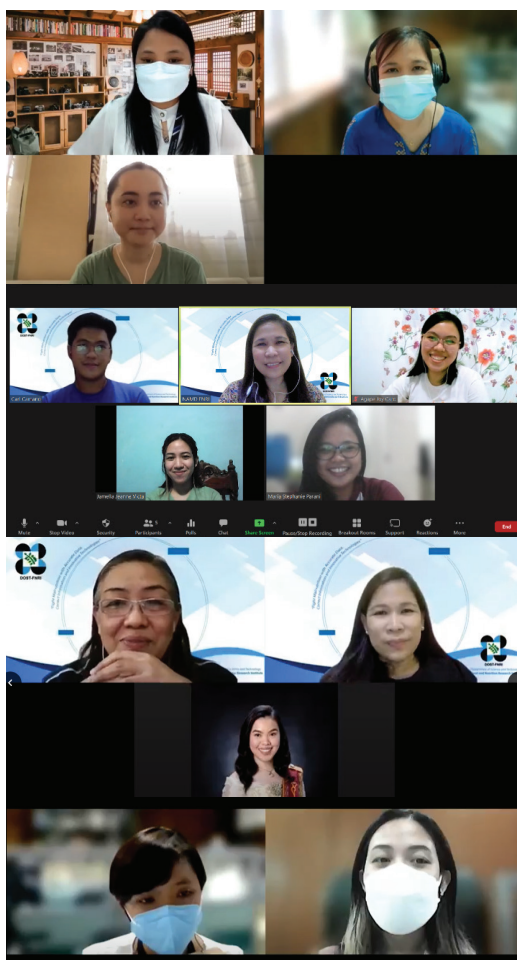


Figure 2. Zoom interview of selected NAMD employees

Findings indicate that the questions in the Filipino version of PASS questionnaire were well understood by the respondents. Moreover, questions about light-intensity physical activities, sedentary behavior, particularly screen-based sedentary activities, and sleep duration and quality were well appraised by the respondents. On the other hand, further review of the following components, built and social environment and physical self-care activities, of the PASS questionnaire should be done to increase comprehensibility and clarity.

# EVALUATION OF THE 2021 INFANT AND YOUNG CHILD FEEDING INDICATORS FOR APPROPRIATE COMPLEMENTARY FEEDING IN RELATION TO DIETARY ADEQUACY AND ANTHROPOMETRIC GROWTH

Eva A. Goyena, Ph.D., Ma. Lynell V. Maniego, and Antoniette G. Cristobal

With the new set of 2021 infant and young child feeding (IYCF) indicators released by the World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF), there is a need to evaluate the validity of these new indicators to ensure applicability in the Philippine setting. This study validated the utility of the new IYCF indicators in assessing the micronutrient and energy adequacy of complementary foods of Filipino children 6–23 months old.

A total of 8360 infants and young children aged 6–23.9 months with complete information on IYCF, anthropometric measurements, maternal information, and household characteristics were included in the study. Data were extracted from the 2018–2019 Expanded National Nutrition Survey. Bivariate and correlation analyses using STATA version 15 (Corp LLC, Texas, USA 2017) were performed to determine

the association of specific IYCF indicators: dietary diversity, meal frequency (MF), and minimum acceptable diet (MAD) with energy and nutrient intake and adequacy.

The 2021 IYCF indicators remain to be appropriate proxy indicators for diet quality, quantity, and overall dietary quality and quantity of complementary foods based on the results of this study. Dietary diversity, MF, and MAD were positively correlated with energy, protein, and micronutrient adequacy regardless of breastfeeding status as shown in the Table 1. However, only the MF indicator was positively correlated with child's anthropometric Z-scores.

These IYCF indicators are practical to reflect dietary adequacy, but may not capture the entire process related to the nutritional outcomes of infants and young children, especially stunting outcome.

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**Diversity of foods, feeding frequency, and acceptability of diet were positively correlated with energy, protein, and micronutrient adequacy regardless of breastfeeding status**

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Dietary Diversity Score																			
Dietary Intake					All Children					Breastfed Children					Non-Breastfed Children				
	<5	5	>5	p-value*	r	<5	5	>5	p-value*	r	<5	5	>5	p-value*	<5	5	>5	p-value*	r
Energy																			
Mean adequacy, %	89.7	95.6	102.0	<0.001	0.059*	79.9	94.9	102.0	<0.001	0.225*	98.5	96.9	101.8	0.922	98.5	96.9	101.8	0.922	-0.0057
Meeting 100% REI, %	29.5	39.5	47.1	<0.001		18.3	40.0	45.7	<0.001		39.7	38.7	51.5	0.497	39.7	38.7	51.5	0.497	
Protein																			
Mean adequacy, %	166.7	189.4	201.3	<0.001	0.100*	103.7	158.7	184.0	<0.001	0.437*	223.7	241.2	257.0	0.048	223.7	241.2	257.0	0.048	0.0552*
Meeting 100% EAR, %	61.1	83.1	92.2	<0.001		36.3	77.6	90.3	<0.001		83.5	92.4	98.3	<0.001	83.5	92.4	98.3	<0.001	
Mean micronutrient adequacy, %	64.3	73.5	79.0	<0.001	0.198*	48.5	68.4	76.2	<0.001	0.475*	78.6	82.1	88.3	<0.001	78.6	82.1	88.3	<0.001	0.1306*
Feeding Frequency																			
	2	3	4	5	≥6	p-value*	r	2	3	4	5	≥6	p-value*	r	2	3	4	5	≥6
Energy																			
Mean adequacy, %	63.9	69.1	76.9	83.3	108.6	<0.001	0.4673*	64.5	70.8	80.8	89.8	116.4	<0.001	0.4721*	41.1	53.4	61.3	73.4	107.1
Meeting 100% REI, %	2.1	9.2	16.9	26.1	48.7	<0.001		1.9	9.3	17.8	31.3	60.8	<0.001		12.5	8.5	13.1	18.1	46.5
Mean micronutrient adequacy, %	35.8	43.3	51.8	63.5	82.7	<0.001	0.6302*	35.6	42.7	50.6	59.8	78.0	<0.001	0.5094*	43.2	48.1	56.5	69.2	83.6
Meeting MAD																			
	Not Meeting		Meeting		p-value*		Not Meeting		Meeting		p-value*		Not Meeting		Meeting		p-value*		
Energy																			
Mean adequacy, %	89.6		98.8		<0.001		79.9		97.3		<0.001		98.2		102.4		0.102		
Meeting 100% REI, %	29.4		43.3		<0.001		18.2		42.2		<0.001		39.4		45.8		0.012		
Protein																			
Mean adequacy, %	166.8		194.2		<0.001		103.7		167.0		<0.001		223.0		260.6		<0.001		
Meeting 100% EAR, %	61.4		85.3		<0.001		36.3		81.7		<0.001		83.7		94.2		<0.001		
Mean micronutrient adequacy, %	64.4		75.2		<0.001		48.5		70.9		<0.001		78.5		85.7		<0.001		

Table 1. Association of dietary diversity score, meal frequency, and minimum acceptable diet, to dietary intakes in children 6-23 months old, Philippines: 2018-2019

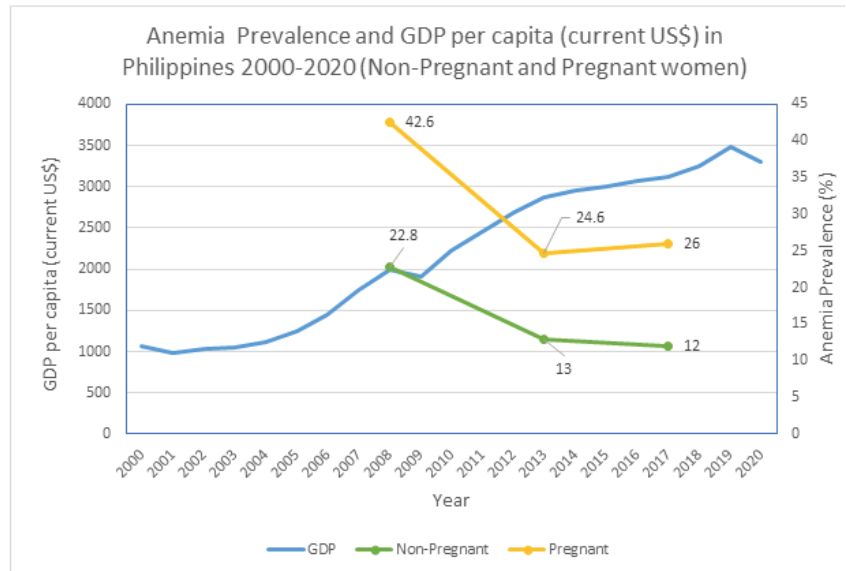
# DRIVERS IN ANEMIA REDUCTION AMONG WOMEN OF REPRODUCTIVE AGE: THE PHILIPPINES CASE STUDY

Imelda Angeles-Agdeppa, Aatekah Owais, Eva A. Goyena, Zulfiqar A. Bhutta, Kaitlyn Samson, Hanah Ahsan, Catherine Merritt, Christopher Lee, Preeti Rattan, Ma. Lynell V. Maniego, Frances Pola S. Arias, Glenda P. Azaña, Josie P. Desnacido, Maylene P. Cajucum, and Anushka Ataullahjan

The Philippines is considered as one of the countries in the world with significant decline in anemia prevalence in WRA from 2008 to 2018, hence considered as an Anemia Exemplar country. The country has achieved ~6X the global mean CAGR (compounded annual growth rate) for anemia reduction. Anemia among non-pregnant WRA declined from 27% in 2008 to 12% in 2018.

To better understand the factors that might have contributed to the decline in the anemic prevalence, the research team conducted a mixed-methods study. A systematic review, descriptive and advanced quantitative analyses, qualitative research, a policy/program review, and a nutrition financing analysis were undertaken, and the results were triangulated to respond to the study objectives. Key findings of the study are briefly summarized below.

It should be emphasized that GDP per capita (current USD) in 2008 to 2018 has increased from \$1998 to \$3350 over the same period where anemia prevalence has experience a steady declining trend (Figure 1). Moreover, since the early 2000s, the Philippines has made considerable gains in poverty reduction; decreased maternal, newborn, and child mortality; increased adult/ youth literacy and female empowerment; increased livestock and cereal production; and improved access to antenatal and postnatal care – all of which are linked to a multifactorial WRA anemia reduction success story. This might have influenced the significant improvements and accessibility in different health



**Figure 1:** Trends in WRA anemia prevalence and GDP per capita in the Philippines from 2000 to 2018.

programs and services due to higher fund allocation.

## Main Findings

- Anemia prevalence among WRA decreased by **15%-points** (overall 56% decrease), from 27% in 2008 to 12% in 2018.
- All regions experienced significant reductions in anemia burden
  - In 2008, anemia prevalence ranged from 39% in Cagayan Valley to 14% in the Zamboanga Peninsula. By 2018 anemia prevalence rates were  $\leq 15\%$  in all regions, except for Cagayan Valley, where the prevalence was 16% (Figure 2).
  - Furthermore, **inequities in anemia burden decreased substantially** during this time, with the **largest decreases in anemia prevalence observed among the poorest and those living in rural areas.**



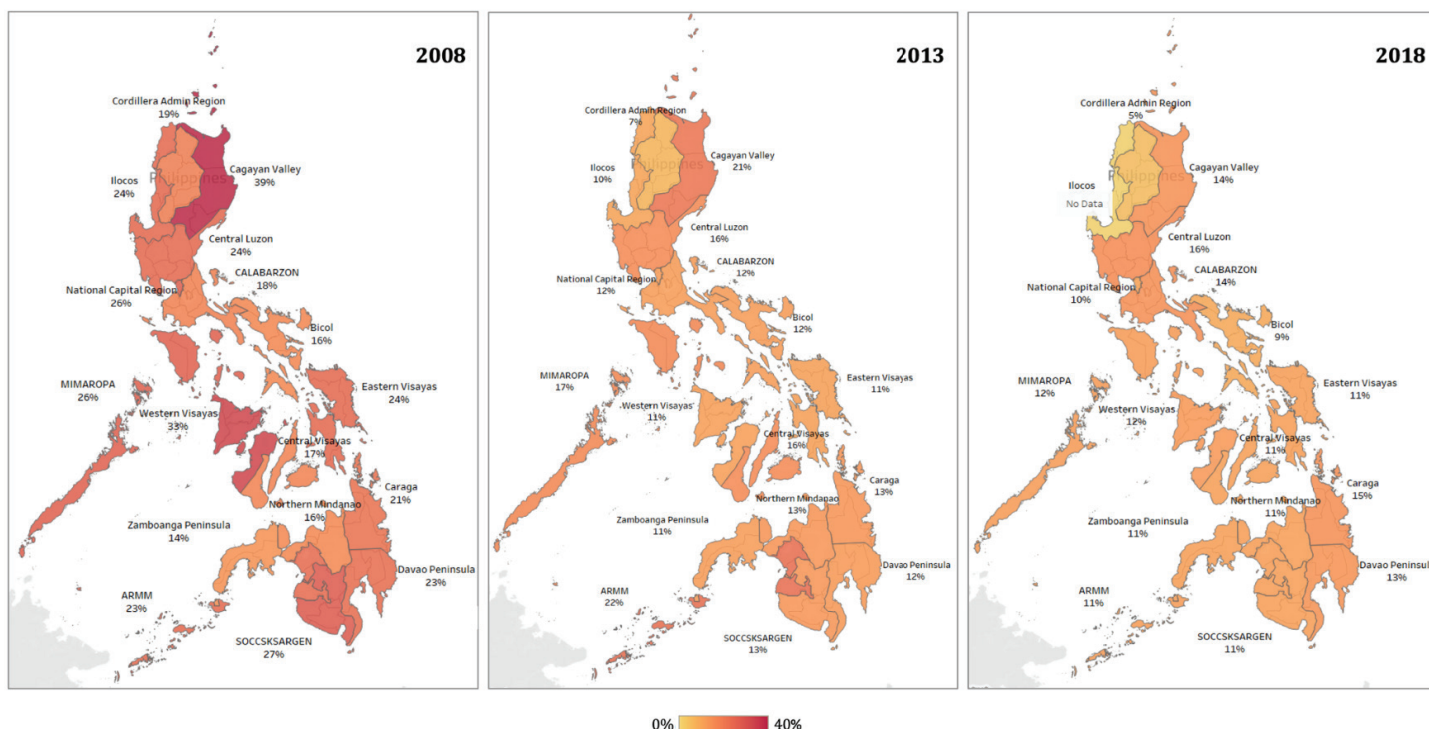


Figure 2: Regional WRA anemia prevalence in 2008 vs. 2018<sup>1</sup> in the Philippines.

- The most important drivers of anemia decline (Figure 3) among WRA were:

- Non-healthcare Sector Funding** (62% of predicted change)

- Poverty alleviation programs through conditional cash transfer and investment in women's education increased** purchasing power – likely leading to improved housing (less crowding, increased household wealth), food security, and improved maternal nutrition (proxied by BMI)

- Direct Healthcare Sector Funding** (44% of predicted change)

- The Philippines effectively invested across healthcare sectors to reduce anemia burden
    - Improvements in **reproductive health, including provision of modern family planning methods**, also contributed to decrease in anemia burden
    - Improvements in healthcare utilization** reflected through expanded coverage of ante-natal care (ANC) visits – likely reflecting improvements in access to health counseling and iron-folic acid (IFA) adherence

<sup>1</sup>Indirect regional estimates generated for the provinces/HUCs covered in the 2018 ENNS. The 2018 ENNS was designed to generate national and provincial/HUC level estimates only. Thus, caution must be observed in comparing estimates across survey years.

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Improvements in reproductive health including family planning, expanded coverage of ante-natal care, poverty alleviation program through conditional cash transfer, and investment in women's education are the most important drivers of anemia decline among WRA in the country. Country experts credited several direct and indirect nutrition programs, both inside and outside the health sector, for having been successful in reducing WRA anemia prevalence in the Philippines

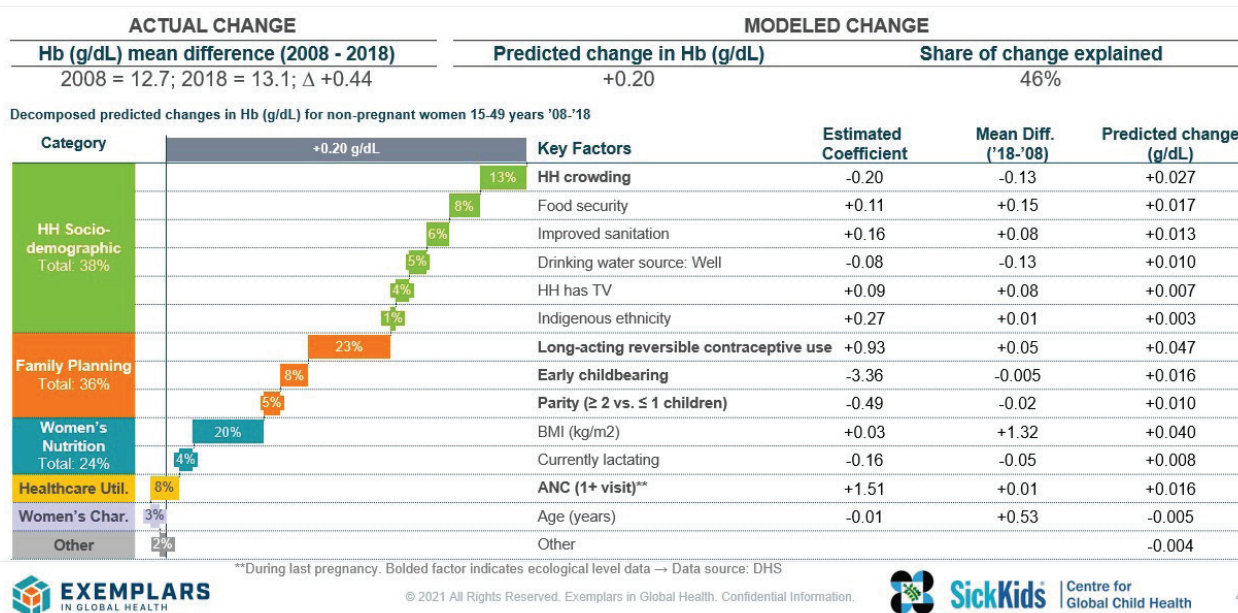
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- Improvements in anemia burden were also driven by effective program design and implementation**

- Health care access and delivery programs specifically targeted



## PHILIPPINES DECOMPOSITION



**Figure 3:** Decomposing predicted changes in hemoglobin (g/dL) (% contribution of determinant domains) among WRA<sup>2</sup> for the period 2008-2018 in The Philippines.

vulnerable or historically underserved populations, including Indigenous Peoples, elderly women, lactating women, and impoverished households

- Policies and programs invested specifically in systems, through broad social spending programming and health care expansion
- These programs were supported through coordination across sectors, to holistically improve financing, regulation, procurement, and human capacity building

### Key Recommendations for Further Accelerating and Sustaining WRA Anemia Reduction

- Continue investments in direct and indirect nutrition programs focused on alleviating micronutrient deficiencies and poverty, leading to continued and sustained improvements in women's health and well-being.
- Target program implementation towards vulnerable or historically underserved populations,

including Indigenous Peoples, and impoverished households.

- Continue to prioritize increasing access to and improving quality of reproductive, antenatal and postnatal care services for women. These visits can also increase coverage of infection prevention strategies, dietary counseling, micronutrient supplementation and other general health programs.
- Prioritize adolescents as a program focus by ensuring that adolescent-friendly health, including reproductive health, and nutrition services are available and easily accessible, to continue improvements in maternal age at first birth, inter-pregnancy interval and parity.
- Harmonize national-level coordination and regional-based programming for nutrition, through improved multi-sectoral planning, financing, implementation, and monitoring and evaluation of nutrition actions.

<sup>2</sup>Analysis restricted to non-pregnant WRA





# DRIVERS OF FOOD INSECURITY IN RURAL AND URBAN HOUSEHOLDS IN THE PHILIPPINES: 2018 EXPANDED NATIONAL NUTRITION SURVEY

Charina A. Javier, James Andrei Justin P. Sy, Charmaine A. Duante,  
Ma. Lilibeth P. Dasco, and Jamella Jeanne P. Victa



Food insecurity is still a pressing problem that often contributes to malnutrition in the Philippines. Results of the 2018 Expanded National Nutrition Survey (ENNS) revealed that 53.9% or more than half of the household have experienced food insecurity. Identifying factors that may have contributed to high prevalence of food insecurity will provide deeper understanding of its causes and thereby guiding policy makers and program implementers properly in addressing food insecurity of the country.

This study investigated the different association of variables such as socio – demographic characteristics, dietary diversity score (DDS), household nutrient intake, and current nutritional status that may influence food insecurity among households by place of residence. This can provide policy inputs to strengthen the

implementation of food security programs in the country.

A total of 43,128 households from the 2018 ENNS were analyzed using descriptive statistics and logistic regression in stata 16.

Results showed that majority of households consume 9-12 food groups in a week, including food insecure households. In particular, 81.8% of food insecure households consume 9-12 food groups in a week.

However, the mean DDS was significantly higher among food secure households in urban areas than rural areas (10.2 vs 10.0) while it is significantly lower among food

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**In both rural and urban areas, the households in the bottom 20% of wealth status were 20 times more likely to be food insecure compared to the households in the highest 20%.**

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insecure households living in rural areas than urban areas (9.7 vs 10.0). In rural areas, the poorest households were 20 times more likely to be food insecure compared to the richest households. Those with five or less household members and without under-5 year-old children were 40% and 30%, respectively, less likely to be food insecure than their counterparts. Meanwhile, in urban areas, the poorest households were 20.2 times more likely to be food insecure compared to the richest households. Those with five or less household members and without under-5 year-old children were both 30% less likely to be food insecure than their counterparts.

The study suggests that there might be a need to review the DDS as a tool to evaluate consumption of households as majority of households in the Philippines are able to consume 9-12 food groups including those



who are food insecure. Nonetheless, food-related or social protection programs are needed especially by those belonging to the poorest wealth quintile and have household head with lower education attainment as they are more likely to be food insecure.





# FACTORS ASSOCIATED WITH CONSUMPTION OF FRUITS AND VEGETABLES AMONG FILIPINO ADULTS: BASED ON 2018-2019 EXPANDED NATIONAL NUTRITION SURVEY (ENNS)

Josie Platon-Desnacido, Eva A. Goyena, Ph.D.,  
Apple Joy D. Ducay, and Chona F. Patalen

Fruits and vegetables provide a significant part of a balanced diet, as they are important sources of nutrients, dietary fiber, and phytochemicals. Despite the well-known benefits of consuming fruits and vegetables, approximately 3.9 million deaths globally were attributable to inadequate fruit and vegetable consumption in 2017 (WHO 2019). Low fruit and vegetable consumption contribute to poor food quality, which in turn raises the prevalence of malnutrition and risk for non-communicable diseases (NCDs).

The World Health Organization (WHO) recommends the consumption of at least

400 grams, or 5 portions, of combined fruits and vegetables per day (WHO 2019). In the Philippines, the consumption of fruits and vegetables among Filipino adults is far below the WHO daily recommendation. A declining per capita intake of fruits and vegetables over the years was evident, from 104 grams of fruits, and 145 grams of vegetables in 1978 to 34 grams of fruits and 127 grams of vegetables in 2018-2019 (DOST-FNRI 2021).

With this current situation, this study is conducted and secondary data of the 47,492 Filipino adults, 19 to 59 years old obtained from the 2018-2019 Expanded

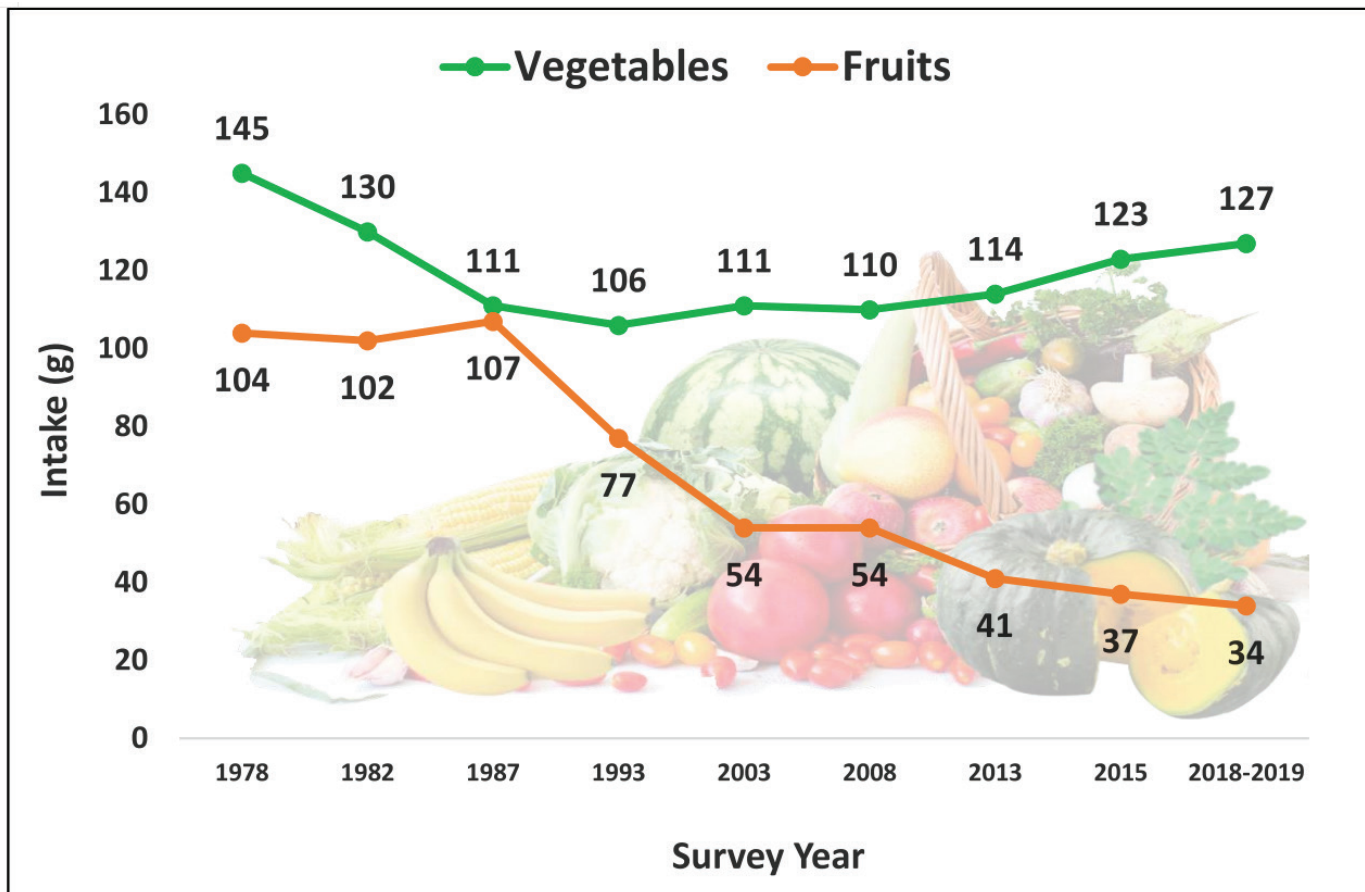


Figure 1. Trends in mean one-day per capita fruit and vegetable consumption: Philippines, 1978 to 2018-2019



National Nutrition Survey (ENNS) were analyzed. Findings revealed that Filipino adults only consumed 59 grams of vegetables and 21 grams of fruits which is far below the recommended amount of at least 400 grams per day. Moreover, there was a significantly higher percentage of male adults, 50–59 years old, separated/annulled/divorced, with no education, employed, residing in rural areas, belonging to households with less than five members, those in the richest quintile, engaged in vegetable gardening, and having fruit-bearing trees that were consuming the recommended daily fruit and vegetable intake ( $\geq 400$  g/day) than their counterpart groups. Furthermore, a significantly higher percentage of adults consumed the daily recommended serving of fruits and vegetables was evident among former smokers, pre-hypertensive adults, and those who met the recommended energy intake and protein requirement. In the final model, factors that were significantly associated with the consumption of fruits and vegetables were marital status (married), working status, household engagement in vegetable gardening and fruit-bearing trees, and energy adequacy.

Educational campaigns, including the promotion of *Pinggag Pinoy*<sup>®</sup> dietary recommendations across age groups, and vegetable gardening at the household and community levels should be intensified through various communication channels

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**Factors that significantly increased the likelihood of consuming the recommended daily servings of fruits and vegetables among adults were being married, employed, belonging to households with vegetable gardening, having fruit-bearing trees, and those who were meeting the recommended energy intake.**

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like social media to help increase the consumption of fruits and vegetables.

“Factors that significantly increased the likelihood of consuming the recommended daily servings of fruits and vegetables among adults were being married, employed, belonging to households with vegetable gardening, having fruit-bearing trees, and those who were meeting the recommended energy intake.”





# PREDICTORS OF PHYSICAL INACTIVITY AMONG FILIPINO ADOLESCENTS: 2018-2019 ENNS

Glenda P. Azaña, Ma. Lynell V. Maniego,  
Jamella Jeanne P. Victa, and Ma. Lilibeth P. Dasco



The World Health Organization (WHO) defined physical inactivity among adolescents as insufficient physical activity level to meet present physical activity recommendations or doing less than 60 minutes of moderate- to vigorous-intensity physical activity per day (WHO, 2020).

In 2016, it was reported that globally, 81% of adolescents aged 11-17 years old do not meet the global recommendations on physical activity (Lancet, 2019). In the Philippines, 79.8% of the adolescents 10-19 years old were insufficiently physically active based on the 2018-2019 Expanded National Nutrition Survey (ENNS) conducted by DOST-FNRI.

Physical inactivity along with unhealthy diet, tobacco use and harmful use of alcohol are the major risk factors in the development of

non-communicable diseases (NCDs). The WHO reported that NCDs accounted for 7 of the 10 leading causes of death globally and more than three quarters of global NCD deaths occur in low- and middle- income countries.

The study assessed the health and nutritional status of Filipino adolescents and determined the different factors associated with physical inactivity. A total of 26,780 adolescents with complete information from the 2018-2019 ENNS data were included in the analysis.

Results showed that adolescents were mostly in the 10-12 years old age group (34.4%), females (50.5%), and reached at least high school level of education (54.3%). Stunting was at 27.3%. Based on BMI-for-age, 12.0% were thin, 9.2% were overweight and

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**Filipino adolescents are more likely to be physically inactive if they are 13-15 years old, female, residing in urban areas, belonged to the richest households and with household heads with higher educational attainment.**

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obese. Anemia prevalence was 7.4%. About 4% were current smokers, 15.7% were current drinkers, and of those current drinkers, 2.7% were engaged in binge drinking. Food consumption of adolescents was inadequate. Consumption of vegetable provided only 5.9% of the total food intake while fruit consumption contribution was even lower at 3.0%. Milk was not popular as it contributed only 0.7%. Majority of adolescents had inadequate energy and nutrient intakes.

Among physically inactive adolescents, those who were not stunted had significantly higher percentage of physical inactivity than stunted or under height adolescents. Further, current smokers and current drinkers have significantly lower percentage of physical inactivity than their counterparts.

Multivariate analysis showed that adolescents had higher risk for physical inactivity if the household head had at least college level, at least high school level and at least elementary level of education; belonged in households residing in urban areas; belonged in the richest wealth quintile households; adolescents 13-15 years old; and female adolescents. Meanwhile, adolescents were less likely to be physically inactive if they belonged in the older age group (16-19 years old); under height; current smokers and current drinkers.

Several changes in the environment and society along with advances in technology provided less opportunities for physical activity and more opportunities for being sedentary particularly among children and adolescents.

With this, the study recommended the following: 1) strengthen promotion of healthy lifestyle habits (i.e., healthy eating, increase physical activity, avoid smoking and drinking alcoholic beverages) particularly among out-of-school youth through the conduct of nutrition education in school and community settings; 2) encourage adolescents to participate in sports/physical activities in school and community to help them avoid unhealthy habits such as smoking and drinking; and 3) enhance/improve existing curriculum on physical education (i.e., particularly among female adolescents as they had higher percentage of insufficient physical activity compared to males) and government programs on adolescents.





# ESTABLISHING BLOOD PRESSURE NORMS FOR FILIPINO CHILDREN

Chona F. Patalen, MPH, Dolores D. Bonzon, M.D., Cecilia Cristina S. Acuin, M.D., Ph.D., Charmaine A. Duante, RMT, Msc. Epid. (PH), Ma. Lynell V. Maniego, Marvin C. Delos Santos, Antoniette G. Cristobal, Ma. Lilibeth P. Dasco, MSAN, MDM, and Imelda Angeles-Agdeppa, Ph.D.

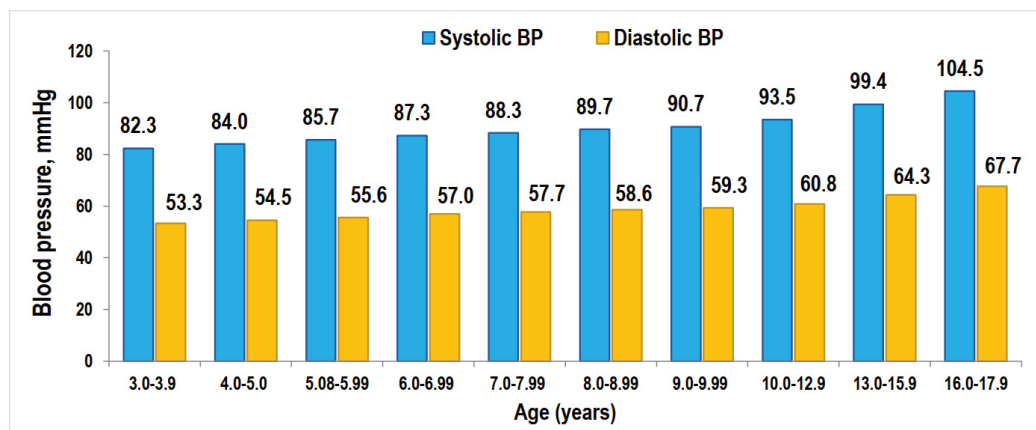
Hypertension is a leading risk factor for cardiovascular diseases and mortality globally. Moreover, hypertension is an emerging health concern in children and adolescents due to increasing childhood obesity. Accurate assessment of blood pressure (BP) and treatment of hypertension in children and adolescents are vital for the prevention of future cardiovascular disease (CVD).

The 2015 nutrition survey conducted by DOST-FNRI showed that mean BP increases with children's age (Figure 1). However, due to the absence of BP norms for Filipino children, there is no way to identify the prevalence of elevated BP in this population group.

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**Establishing blood pressure norms is vital in the diagnosis and treatment of hypertension in Filipino children and adolescents to minimize long-term consequences of hypertension.**

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**Figure 1.** Mean systolic blood pressure and diastolic blood pressure of children, 3.0 to 9.9 years old, and adolescents, 10.0 to 17.9 years old, by age group: Philippines, 2015

The interpretation of blood pressure readings is not as straightforward in children, as it is in adults because of the nonlinear relationship between blood pressure and both age and height (Rosner et al., 2008). While the hypertension cut-offs in adults are determined based on clinical outcomes, particularly for risk of CVDs and mortality, this is not possible in children

because most of these cardiovascular outcomes usually occur during adulthood (NHBPEP, 2004). Hence, the cut-offs for childhood hypertension are often based upon the normative distribution of BP in healthy children (Rosner et al., 1993).

In the absence of Filipino pediatric BP nomograms, our pediatricians have been using the childhood BP tables of the United States (US). However, it may not be suitable for Filipino children due to the differences in race and ethnicity. Further, height deciles used in these tables are based on the US Center for Disease Control and Prevention



(CDC) growth reference standards, whereas the Philippines uses the World Health Organization Child Growth Standard (WHO CGS) as a matter of policy.

In order to establish BP norms for Filipino children, that could then be used as reference in identifying hypertension among children, this study was conducted in collaboration with the Philippine Society of Hypertension, Inc. to provide the auscultatory BP normative reference values for normal-weight Filipino children and adolescents. This will be more appropriate to use as it will be based on Philippine-wide randomly collected data and will make use of the WHO child growth reference standards, as consistent with Philippine policy and practice.

The BP measurements in children and adolescents aged 3.0 to 17.9 years old were performed in the 2015 survey, Updating of the Nutritional Status of Filipino Children and Other Population Groups (Updating Survey). Researchers were trained by the UP Philippine of General Hospital Department of Pediatrics before deployment.



In the survey, BP was measured using a non-mercurial sphygmomanometer and a dual stethoscope, following standard procedures. Sex-, age-, and height-specific systolic BP (SBP) and diastolic BP (DBP) percentiles were calculated in normal-weight children and adolescents to avoid bias as evidences showed strong association between overweight and obesity and hypertension.

In this study, the 50th, 90th, 95th, and 95th+12 mmHg percentiles of SBP and DBP tables of normal-weight children and adolescents aged 3.0 to 17.9 years were presented by sex, age, and height percentiles. These cut-offs will be vital in the diagnosis and treatment of hypertension in Filipino children and adolescents to minimize long-term consequences of hypertension.





# FACTORS ASSOCIATED WITH HIGH FASTING BLOOD GLUCOSE AMONG FILIPINO ADULTS NOT DIAGNOSED WITH DIABETES

Chona F. Patalen, Maria Stephanie N. Parani, Apple Joy D. Ducay, Catherine M. Iranzo, and Charmaine A. Duante



GLOBAL 2025 TARGET

DIABETES/  
OBESITY

0%  
INCREASE

Diabetes is a serious chronic disease characterized by elevated levels of blood glucose. In the Philippines, the prevalence of impaired fasting glucose and high fasting blood glucose (FBG) exhibited a steady increase over a ten-year period, from 2008 to 2018–2019 (Figure 1).

It is crucial to understand the factors associated with high FBG among adults not diagnosed with diabetes to help prevent the increase in its prevalence in the country. In this context, this study aimed to determine the prevalence and factors associated with high FBG among Filipino adults not diagnosed with diabetes.

Undiagnosed diabetes or having an FBG level of  $\geq 126$  mg/dL with no confirmation or diagnosis of raised blood sugar or diabetes from a doctor or health professional, can lead to serious medical problems if left untreated, thus emphasizing the need for early diagnosis and treatment.

Secondary analysis of the cross-sectional survey data was done utilizing the 2018–2019 Expanded National Nutrition Survey (ENNS) of the DOST–FNRI. Filipino adults, 20 years old and above, with complete anthropometric data, blood pressure (BP) measurement, FBG, and behavioral and dietary risk factors of non-communicable diseases (NCDs) were included in the analysis. Descriptive statistics were generated to determine the general characteristics of participants, and multivariable logistic regression was done to identify the factors associated with high FBG among adults not diagnosed with diabetes.

Notably, the prevalence of high FBG and undiagnosed diabetes were more common among males (6.4%), pensioners (9.3%), those with at least elementary level of education (6.8%), living in urban areas (6.8%), and belonging to the richest wealth quintile (7.6%).

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**Older age, belonging to the rich wealth quintile, overweight and obesity, including central obesity (high WC and high WHR), elevated BP, smoking, and daily alcohol drinking were associated with undiagnosed diabetes.**

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The prevalence was also higher among adults who were overweight and obese (8.5% and 12.4%), had high waist circumference (WC) (10.3%) and high waist-hip ratio (WHR) (9.0%), had elevated BP (13.0%), insufficiently physically active (6.4%), current and former smokers (6.2% and 6.3%), daily alcohol drinkers (13.2%), and those engaged in binge drinking (7.0%).

The factors that were found to be associated with higher chances of having undiagnosed diabetes included older age 50–59 years old with OR of 3.29 (CI 2.52–4.28;  $p < 0.001$ ) and 60 years old and above (OR 3.21, CI 2.46–4.20,  $p < 0.001$ ), belonging to the rich wealth quintile (OR 1.20, CI 1.02–1.40,  $p = 0.029$ ), overweight (OR 1.23, CI 1.06–1.43,  $p = 0.011$ ) and obesity (OR 1.59, CI 1.33–1.91,  $p < 0.001$ ), high WC (OR 20.6, CI 1.19–1.56,  $p < 0.001$ ) and high WHR (OR 2.06, CI 1.78–2.39,  $p < 0.001$ ), elevated BP (OR 2.34, CI 1.95–2.82,  $p < 0.001$ ), smoking (OR 1.26, CI 1.08–1.47,  $p = 0.007$ ), and daily alcohol drinking (OR 1.67, CI 1.35–2.06,  $p < 0.001$ ).

Early detection strategies and effective management must be in place in order to curb the prevalence of undiagnosed diabetes among Filipinos. Enhancing the health care access and targeted screening programs are needed to address the identified burden of undiagnosed diabetes in the Philippines.

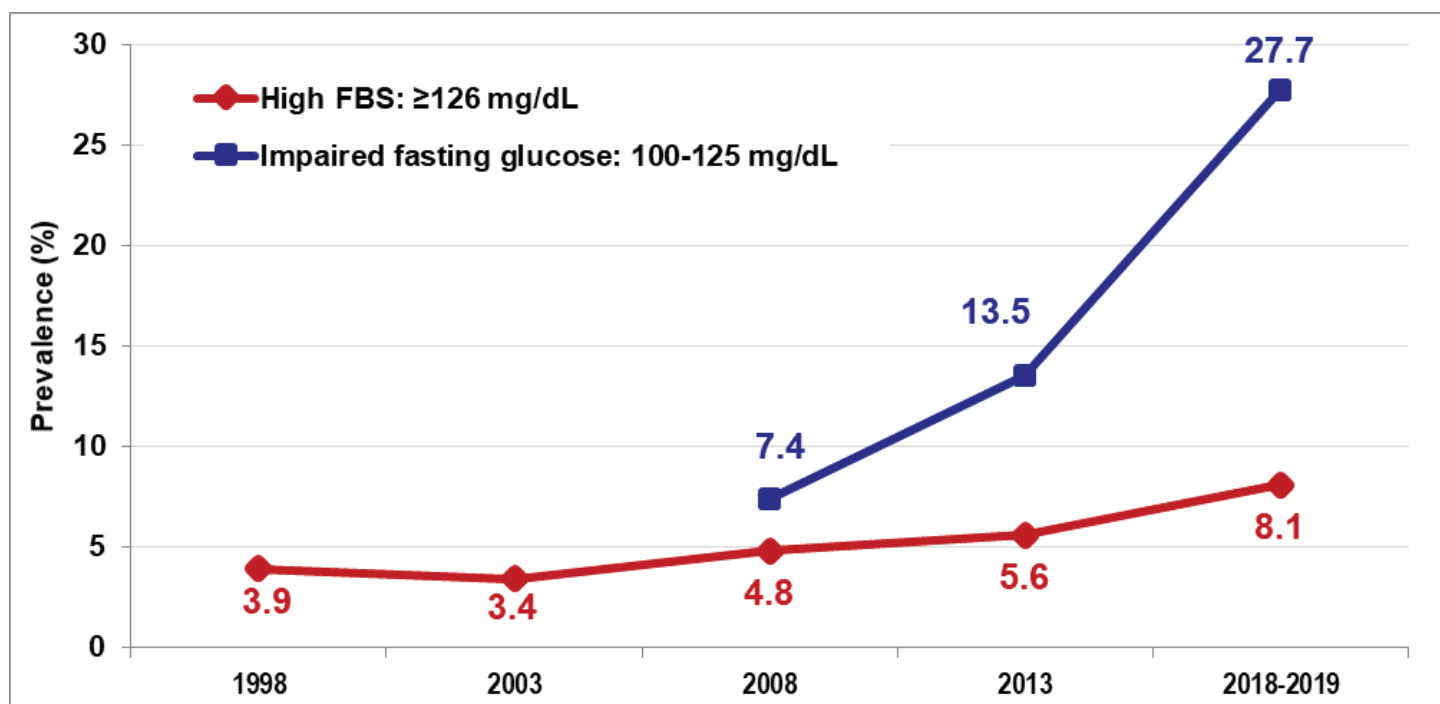


Figure 1. Trends in the prevalence of impaired fasting glucose and high fasting blood glucose among adults, 20 years old and above: Philippines, 1998 to 2018-2019



# THE ASSOCIATION OF MICRONUTRIENT SUPPLEMENTATION ON HEALTH AND NUTRITION STATUS OF UNDER FIVES

Patricia Isabel Gayya-Amita



Micronutrients are vitamins and minerals that the human body need in minute amounts. However, they have a significant influence on a person's health. Micronutrient deficits have been linked to impairments in development, immunity, and cognitive function, as well as decreased academic performance and increased morbidity and mortality in children. In terms of global public health, iodine, vitamin A, and iron are the most essential; their shortage poses a serious threat to the health and development of populations all over the globe, particularly children and pregnant women in low-income nations.

Although significant progress has been made over the past few decades in reducing the prevalence of micronutrient malnutrition, in the Philippines, infants six months to less than one year old had the highest prevalence of anemia at 43.1%, and

the prevalence of vitamin A deficiency among children aged 6 months-5 years was at 15.7%.

Micronutrient Supplementation is one of the programs that are proven highly effective in combatting illnesses caused by micronutrient deficiencies, yet they are under-utilized by the community. The main purpose of this study is to evaluate

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**Micronutrient Supplementation is one of the programs that are proven highly effective in combatting illnesses caused by micronutrient deficiencies, yet they are under-utilized by the community.**

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the association of participation in micronutrient supplementation, specifically Vitamin A & Iron supplementation and adding Micronutrient Powder on food, on health and nutrition status of under-fives. This study utilized the secondary data of the 2018-2019 ENNS conducted by the DOST-FNRI and a total of 29,551 under-five children were included. The data obtained



were nutritional status, socio-economic and demographic profile and biochemical indicators.

According to the study results, the mean serum retinol of under-fives participating in Vitamin A Supplementation is at 27.7  $\mu\text{g/dL}$ , with a 15.4% prevalence of Vitamin A deficiency. On the other hand, the mean hemoglobin level of those participating in Iron Supplementation is at 11.9 g/dL with a 15.2% prevalence of Iron Deficiency Anemia. However, this study did not find any association between Vitamin A supplementation and Vitamin A deficiency status, nor did it find any association between participating in Iron Supplementation and anemia status. Further, adding Micronutrient Powder to food was not also associated with anemia and Vitamin A deficiency status. Despite

these results, the study could be used for developing better targeted strategies to reduce childhood anemia and Vitamin A deficiency in the Philippines. This study was the first attempt of measuring the association of the Vitamin A, Iron and Micronutrient Powder supplementation on anemia and Vitamin A deficiency status of under-fives using a nationally representative sample. The study's findings also identified areas that needed more research, including investigation of the lack of relation between Iron, Vitamin A and MNP supplementation and anemia & Vitamin A deficiency status, examination of the content and quality of the supplements for children, the level of adherence to the suggested regimen of administration and the actual coverage of under-fives with the supplements.





# PROTECTING HEALTH AND NUTRITION OF VULNERABLE GROUPS IN EMERGENCIES

Ma. Anna Rita M. Ramirez, Georgina S. Caraig, and Nesrianne G. Buyco



Photo credits: AFP via TEMPO

Extreme weather conditions brought about by global warming and climate change have become disastrous to life and property. The Philippines has been tagged as third among 172 countries with highest disaster risk in the 2018 World Risk Index combining “exposure to extreme natural events and vulnerability as indicator of society’s capacity to respond to such events” (Heintze, Kirch, Küppers, Mann, Mischo, Mucke, Pazdzierny, Prütz, Radtke, Strube, & Weller, 2018).

According to the study of Uichanco (2015), it has been observed that the difficulty or challenge of relief operation or humanitarian logistics is highest during sudden and dispersed disasters which is certainly the case in the Philippines. The geographic landscape of the Philippines makes disaster relief operations very difficult.

At the core of this is ensuring food security especially among nutritionally-vulnerable groups. Pre-positioning relief items as implemented by DSWD, according to Uichanco (2015), are beset with many challenges that make it difficult to implement, such as the unpredictable nature of the typhoon path as well as the transportation network that can be disrupted during and post-disaster. In addition, the content and nutritional value of the Food for Peace (FFPs) are equally important.

An emerging concern in the malnutrition agenda is climate change that has made an impact across nations and populations. As this happens, food security is compromised both at the macro and household level. Particularly vulnerable are the poor households and nutritionally-vulnerable population groups.

The project examined the implementation of policies in emergencies and provided insights into its operationalization on the ground from the perspective of program implementers as key informants and program beneficiaries. It was carried out in two phases, Phase 1 covering the coronavirus disease or COVID-19 pandemic in Muntinlupa City, Talavera, Nueva Ecija and Iba, Zambales; and Phase 2 covering typhoon and phreatic eruption as typology of disaster in Salcedo, Eastern Samar and Agoncillo, Batangas.

Disaster food relief operations during the height of COVID-19 pandemic was beset by several challenges one of which is sustaining the food supply chain especially to highly urbanized cities (that do not have direct access to fresh produce in the long term) and the marginalized sectors on top of challenges in terms of the quantity and quality of food relief packs. Some local government units (LGUs) saw these as opportunities to be innovative in the contents of food relief packs, such as inclusion of dressed or live chickens, eggs or vegetables.

In contrast, food relief operations during the Taal phreatic eruption were not a problem in terms of quantity and quality since aid came from all over the country and disaster relief was more area-focused.

In the case of typhoon in Salcedo, Eastern Samar, coordination between the municipal and barangay officials, community health workers, and NGOs were primary drivers in ensuring that the food relief operations were smooth and organized. While breastfeeding spaces were available in evacuation centers, some respondents think that creation of safe spaces for children and adolescents were lacking, citing instances of physical abuse and rape.

Some mothers asked for formula milk for their babies on occasions when breastmilk production was affected due to stress,

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**The vulnerability of infants and young children, women, older persons and people with special needs is paramount to the LGU's disaster response and mitigation plans.**

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whose call cannot be ignored by some local chief executives. Despite warnings on adherence to the Milk Code, distribution of milk and processed (branded) complementary foods on certain occasions indicated lapses in monitoring.

LGUs went beyond the minimum response as per Disaster Risk Reduction and Management (DRRM) plan in terms of contents of family food packs in the cases of COVID-19 and phreatic eruption food relief operations. Budget appropriation for disasters and natural calamities remain a problem, however, (overwhelming) humanitarian response complements this constraint. Responses of key informants and program beneficiaries indicate that disaster response remain fluid amidst these various types of emergency situations.





# EVALUATION OF MACRO- AND MICRONUTRIENT INTAKE OF STUNTED FILIPINO SCHOOL-AGE CHILDREN, 5 TO 10 YEARS OLD

Maylene P. Cajucum, Frances Pola S. Arias, Apple Joy D. Ducay, and Jamella Jeanne P. Victa



Photo grabbed from The World Bank Acayan, E. 2021. Undernutrition in the Philippines: Scale, Scope, and Opportunities for Nutrition Policy and Programming

Stunting is one of the important indicators used to assess chronic form of malnutrition among children. It refers to children who are too short for their age as a result of inadequate intake, poor health, and environmental factors among others (WHO, 2015). Over the last few decades, stunting has decreased globally, however, the prevalence remains high in underdeveloped and developing countries. In the Philippines, despite the significant decrease in the prevalence of stunting among school-age children from 31.1% in 2015 to 25.5% in 2018-2019 (DOST-FNRI), the nutritional problem remains at “high” public health concern.

The school-age period is nutritionally significant because this is the prime time to build up body stores of nutrients in preparation for rapid growth of adolescence. Since school-age children go through different stages of development,

they also have increasing dietary needs which may lead to chronic undernutrition if these needs are not addressed. A child's growth is the most important indicator of health, which is influenced and measured by adequate intakes of food and nutrients and a decreased susceptibility to disease.

The main purpose of this study was to determine the macro- and micronutrient intake of stunted Filipino school-age children using the food consumption data from the 2018-2019 Expanded National Nutrition Survey (ENNS). This study utilized the secondary data of the 2018-2019 ENNS conducted by the DOST-FNRI and a total of 26,332 five (5) to 10 years old school-age children were included. The data obtained were nutritional status, socio-economic status, and demographic profile, and nutrient intake. Estimation of mean and usual intake of energy and nutrients were performed.

Among the school-age children covered in the ENNS, 24.2% (6,365) were stunted. Overall, the proportion of stunted school-age children meeting the recommended intake for energy (7.6%), iron (12.1%), calcium (8.0%), vitamin A (22.1%), vitamin C (14.7%), thiamin (24.2%), and riboflavin (25.8%), were quite low given that only a quarter or less

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**Although there is a decreasing prevalence in undernutrition in the country, continuous efforts to target micronutrient deficiencies should still be done to prevent consequences of chronic child malnutrition which may even persist through adulthood.**

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urban households as compared to rural households, which deems the school-age children from rural households more vulnerable to energy and nutrient deficiencies.

Although there is a decreasing prevalence in undernutrition in the country, continuous efforts to target micronutrient deficiencies should still be done to prevent consequences of chronic child malnutrition which may even persist through adulthood. We need to look deeper into the determinants of stunting when it comes to place of residence to better direct appropriate interventions to the target population group. It is best recommended to further strengthen programs on nutrition education, dietary supplementation, food fortification, and dietary diversification.

were meeting the recommendations for these nutrients. In terms of the differences in place of residence, the percentage of stunted children meeting the requirements for energy, iron, vitamin A, thiamin, and riboflavin were significantly higher among

ENERGY AND NUTRIENTS	ALL	RURAL	URBAN
Energy (kcal)*	7.6%	6.6%	9.3%
Protein (g)	59.3%	58.1%	61.5%
Iron (mg)*	12.1%	10.5%	15.0%
Calcium (g)	8.0%	7.4%	9.2%
Vitamin A (mcg RE)*	22.1%	20.5%	24.8%
Vitamin C (mg)	14.7%	15.1%	13.9%
Thiamin (mg)*	24.2%	22.5%	27.0%
Riboflavin (mg)*	25.8%	23.6%	29.8%
Niacin (mg)	60.1%	58.5%	62.8%

**Percentage of stunted school-age children with adequate nutrient intake based on the Recommended Energy Intake (REI) and Estimated Average Requirements (EAR) for nutrients, by place of residence**







# **NUTRITION SURVEY AND RELATED STUDIES**

# THE 2021 EXPANDED NATIONAL NUTRITION SURVEY (ENNS)

## THE THIRD AND LAST YEAR OF IMPLEMENTATION

Imelda Angeles-Agdeppa, Ph.D., Charmaine A. Duante, MSc Epid (PH), Ma. Lilibeth P. Dasco, Cristina G. Malabad, Maria Stephanie N. Parani, Rosemarie J. Dumag, Dave P. Briones, Glenda P. Azaña, Chona F. Patalen, Charina A. Javier, Eva A. Goyena, Ph.D., Josie P. Desnacido, Glen Melvin P. Gironella, Ma. Lynell V. Maniego, Mae Ann S.A. Javier, Eldridge B. Ferrer, Apple Joy D. Ducay, Cheder D. Sumangue, Marvin C. delos Santos, and Chester G. Francisco

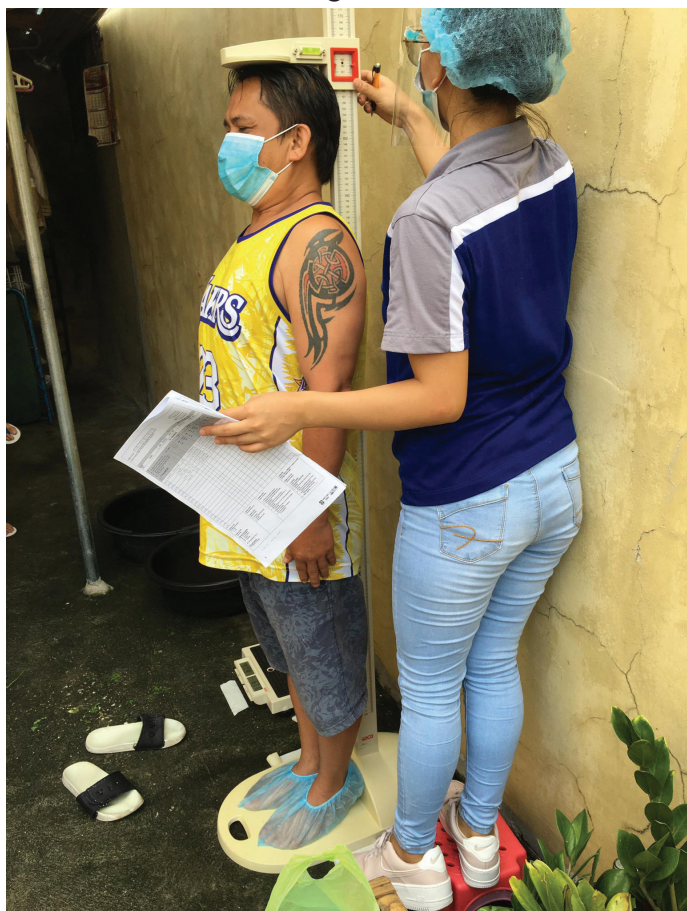
Pursuant to fulfilling the mandate to define and update the food and nutrition situation, particularly that of children and other nutritionally vulnerable groups in the Philippines, the DOST-FNRI conducted the National Nutrition Survey (NNS) every five years and the Updating of the Nutritional Status of Filipino Children and Other Population Groups (Updating Survey) in between the NNS from 1978 to 2015 to provide updates on the nutritional status of the population.

In the NNS, estimates are generated at the national and regional levels. However,

local government units (LGUs), Congress of the Philippines, and other stakeholders appealed for a more localized data to be used for their local development plan and programming. Thus, the NNS was redesigned as a rolling survey for three consecutive years starting from 2018 until 2020 to cover 81 provinces, 33 highly urbanized cities (HUCs), and 3 other urban areas, and it was consequently renamed to Expanded National Nutrition Survey (ENNS).

Apart from providing local-level estimates of the health and nutritional status of Filipinos in the areas covered during the survey period, the ENNS also provided annual national estimates. Thus, further enhancing program planning and assisting with developing timely policies at the national and local levels. However, the third and last year of its implementation was moved to 2021 due to the COVID-19 pandemic.

The ENNS utilized the 2013 Master Sample (MS) of the Philippine Statistics Authority (PSA) as its sampling design to select the target households. The number of households covered has increased fourfold to generate reliable provincial and HUC estimates which required considerable resources for the highly specialized data collection in the ENNS. An average of 1,536 households were targeted per sampling domain (81 provinces, 33 HUCs, 3 other areas), while only 50% of the target households were covered for the biochemical, blood parameters of the clinical and health, and dietary survey components due to high





cost of laboratory analyses and tedious data collection for the dietary component.

For the third year of the ENNS, 37 areas were covered from July 2021 to June 2022. A total of nine survey components were included in the ENNS to assess food, health, and nutritional status of the population across life stages. The components include: Anthropometric, Biochemical, Clinical and Health, Dietary (24-hour food recall only), Socio-economic, Food Security, Government Program Participation, Infant and Young Child Feeding (IYCF) Practices, and Maternal Health and Nutrition. This last year of implementation is a crucial undertaking of the Institute as this was

province or municipality. Local researchers who contracted the virus during data collection were isolated and gathered data through phone interviews.

During this challenging time of data collection, wearing of surgical mask, face shield, and surgical gloves, and conduct of physical distancing were strictly implemented. An overall PPE suit for researchers were also implemented in high-risk areas, particularly in the National Capital Region. Trained nutritionist-dietitians (NDs), nurses, and allied health professionals collected anthropometric measurements (weight, height/recumbent length, waist circumference), and blood



conducted during the height of the COVID-19 pandemic. Even during this difficult time, the DOST-FNRI remained committed in fulfilling its mandate by taking the necessary precautionary steps in coordination with the local COVID-19 Inter-Agency Task Force (IATF) for the Management of Emerging Infectious Diseases, to protect both the health of field researchers and survey participants during the conduct of the survey. Researchers have experienced undergoing mandatory quarantine upon entry in the province, before going to the barangays. They have also been tested for COVID-19 virus either through RT-PCR or anti-gen, depending on the protocols of the

pressure measurements in less than 15 minutes per participant per measurement. The same duration was carried out for blood collection to assess the prevalence of anemia, vitamin A deficiency, high fasting blood sugar, and dyslipidemia among selected population groups. Urine samples were also collected to determine the level of urinary iodine concentration and assess iodine deficiency among selected age groups. Other survey components requiring face-to-face interviews such as individual food recall and information regarding select lifestyle and behavioral factors were conducted outside the house for more air circulation and space

to practice the one-meter physical distancing. All collected data were still encoded in an electronic Data Collection System (e-DCS) to facilitate the process of data collection in a structured manner, therefore minimizing errors. Moreover, data cleaning, validation, and screening were done prior to data analysis. About 230 NDs, medical technologists, nurses, and other allied health professionals were trained and hired as field researchers.

The results of the 2021 ENNS were disseminated in November 14, 2022 during the National Nutrition Summit, and completed the local-level dissemination fora for 37 areas from November 15 to

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**The third year of the ENNS generated results from the data of 48,530 households and 141,189 individuals collected in 37 areas which provided empirical data on nutrition and health status at the national and provincial/HUC level during the height of COVID-19 pandemic.**

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December 14, 2022. There was a total of 48,530 households covered in 2021 with a response rate of 91.3%, and 141,189 individuals with response rate of 70.03%. Slide decks used in the 2021 ENNS dissemination were also accessible online (<http://enutrition.fnri.dost.gov.ph>).

The results of the 2021 ENNS served as basis for the development of the Philippine Development Plan for 2023–2028, and the Philippine Plan of Action for Nutrition for 2023–2028, and anchored to the goals of the AmBisyon Natin 2040. Moreover, this will serve as the backbone of future nutrition legislations and actions plans

in the country, and basis during conduct of numerous researches and in-depth studies that aims to address various health and nutrition agenda.

The final 2021 ENNS results will be presented by DOST-FNRI through publication of the Philippine Nutrition Facts and Figures and monographs per province or HUC. Previous results of the ENNS can be viewed electronically (<http://enutrition.fnri.dost.gov.ph>), while print materials can be accessed at the DOST-FNRI Information Resource Station (formerly Library).





# VITAMIN A STATUS OF FILIPINO PRESCHOOL CHILDREN AND PREGNANT WOMEN

Mario V. Capanzana, Ph.D, Imelda A. Agdeppa, Ph.D, Marina B. Vargas, Ph.D.†, Glenda P. Azana, Ma. Lilibeth P. Dasco, Charmaine A. Duante, Michael E. Serafico, Rosemarie J. Dumag, Dave P. Briones, Marites V. Alibayan, Joselita Rosario C. Ulanday, and Cheder D. Sumangue



Vitamin A deficiency (VAD) among preschool-age children, 6 months to 5 years, has become an important public health concern because of its high prevalence rate particularly among the 6 months to less than 1-year old infants. While the prevalence of VAD among pregnant women (PW) is decreasing, they are still susceptible to VAD throughout pregnancy. Thus, monitoring of the vitamin A status of these vulnerable population groups has to be regularly conducted.

The study assessed the vitamin A status of preschool-age children (PSC) and PW based on serum retinol (SR) concentration.

Results of the 2018-2019 ENNS showed that among PSC, 21.3% were underweight, 30.2% were stunted, 5.3% thin, 3.0% overweight, and 13.5% anemic. Among PW, more than half had at least high school level of education (59.9%), 40.5% were already in

the 2nd trimester of pregnancy, 20.4% were nutritionally at-risk and 22.7% were anemic. Mean SR of PSC was of “acceptable” level at 27.6  $\mu\text{g}/\text{dL}$  however, VAD prevalence (15.5%) was of “moderate” public health problem. The 6-11 months had the highest VAD at 21.8%. Meanwhile, the mean SR among PW was acceptable at 36.3  $\mu\text{g}/\text{dL}$  and VAD was of “mild” level at 3.0%.

There was no significant difference in the VAD prevalence between PSC who received and did not receive vitamin A capsule (VAC) as well as, among PW who consumed and did not consume any type of supplement.

VA deficient PSC had significantly lower mean one-day intake in 4 out of 5 food groups compared with non-VA deficient PSC as well as, in the mean energy intake, mean VA intake, and percentage meeting the  $\geq 100\%$  REI and EAR for energy and VA intakes, respectively. On the other hand, VA



deficient PW had significantly lower mean one-day intake for fish, meat, or poultry.

The non-anemic PSC and non-anemic PW have significantly lower VAD prevalence than their counterparts.

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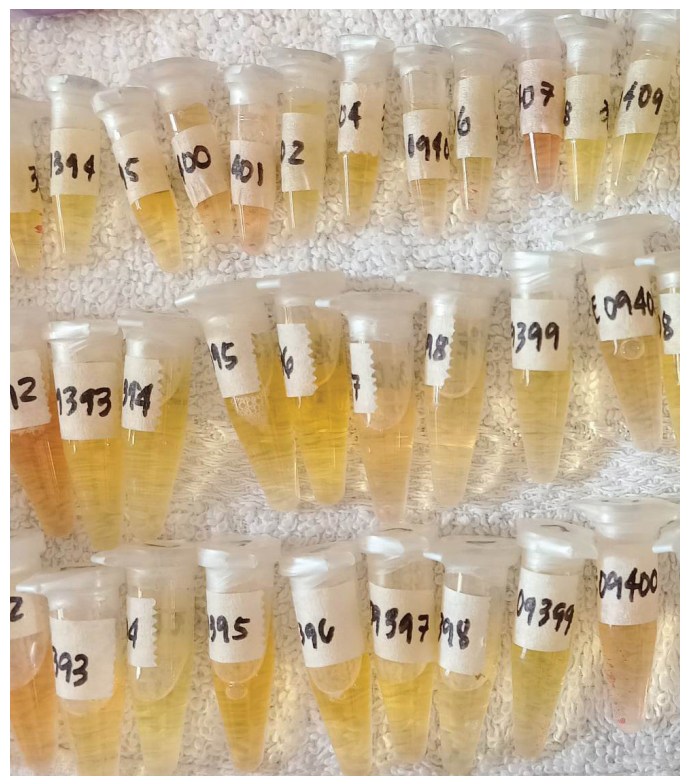
**Vitamin A deficiency was of ‘moderate’ public health problem among Filipino preschool-age children while it was of ‘mild’ level among pregnant women. VAD was significantly higher among anemic than non-anemic PSC and PW**

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Multivariate analysis showed that PSC were more likely to have VAD if they were anemic and belonged to either poor or middle wealth status households. In contrast, there was a lower chance for VAD if the PSC was female and those with adequate vitamin A intake.

Meanwhile, bivariate analysis among PW showed that the likelihood of being VA deficient was higher among those in the 3rd trimester of pregnancy and had three or more pregnancies already. On the other hand, lower risk was noted among PW who already given birth 1-2 times.

Although no significant association was found between VAD prevalence and those who received and did not receive VAC, it is still important for PSC to receive the 2 times a year VAC to help maintain, improve and prevent further worsening of their vitamin A status.



There is also a need to strengthen promotion and advocacy among PW and lactating women, using simple and easy to understand messages on importance of the following: First 1000 Days of life, well-balanced diet and consumption of vitamin-A rich foods; and utilization of available local health and nutrition services (i.e., micronutrient supplementation, vaccinations, vitamins, and nutrition counselling).





# IODINE STATUS IN FILIPINO WOMEN: PREGNANT, LACTATING AND AT REPRODUCTIVE AGE

Mario V. Capanzana, Ph.D, Imelda A. Agdeppa, Ph.D, Marina B. Vargas, Ph.D.†, Glenda P. Azaña, Ma. Lilibeth P. Dasco, Charmaine A. Duante, Michael E. Serafico, Rosemarie J. Dumag, Dave P. Briones, Marites V. Alibayan, Joselita Rosario C. Ulanday, and Cheder D. Sumangue



Women of reproductive age (WRA) is defined by Philippine Statistics Authority as those aged 15 to 49 years old. In 2020, it was reported that 27.85 million or 51.9% of the 53.65 million female household population belonged to WRA.

Iodine deficiency among WRA including pregnant women (PW), lactating women (LW) and women of childbearing age has become an important public health concern because of the harmful consequences that they may cause to the neonate or infants as well as to the women itself.

This study assessed the iodine status of PW, LW and non-pregnant and non-lactating women (NPNL) based on median urinary iodine concentration (UIC).

Results of the 2018–2019 ENNS showed that more than half of the WRA had at least high school level of education and belonged to households residing in urban areas. By nutritional status, overweight prevalence was more common than chronic energy deficiency among NPNL women and LW while one (1) in every five (5) PW was nutritionally at-risk of delivering low birth weight babies.

The iodine intake of NPNL women was sufficient at 169 µg/L. On the other hand, the median UIC of LW (99 µg/L) and PW (122 µg/L) indicated insufficient iodine intake and more than 20% in both groups of WRA had UI level of <50 µg/L.

By place of residence, optimal iodine nutrition was evident among NPNL women in both rural and urban areas. In contrast,

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**Filipino pregnant and lactating women had insufficient iodine intake and iodine deficiency was prevalent in both groups. The use of inadequately iodized salt increases the risk for iodine deficiency in these groups.**

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PW in both areas had inadequate iodine intake. Meanwhile, LW in rural areas had lower median UIC than urban reflecting insufficient intake of iodine.

Across wealth quintiles, the NPWL had sufficient iodine intake while PW had inadequate intake. LW in the poorest households had insufficient iodine intake compared with other wealth quintile groups.

On the use of iodized salt based on WYD test, NPWL women, LW and PW belonging to households using adequately iodized salt had sufficient iodine intake compared to their respective counterparts.

Logistic regression revealed that among NPWL women, the likelihood of being iodine deficient was higher among those in the older age groups (30 years old and above), with low educational attainment (no grade completed or at least elementary level), in the poorest households, residing in rural areas, reported not using iodized salt, and using inadequately iodized salt based on

WYD test.

Among LW, those with no grade completed, in poorest households and using inadequately iodized salt based on WYD test increased the risk for iodine deficiency. Meanwhile, among PW the risk of being iodine deficient was higher among those in the 2nd and 3rd trimesters of pregnancy and belonged to households not using adequately iodized salt based on WYD test.

The use of inadequately iodized salt was the common characteristic that increases risk for iodine deficiency among WRA. This indicates the importance of continued promotion and advocacy on the use of iodized salt as well as, consumption of iodine-rich foods particularly among PW and LW as these groups have insufficient iodine intake. Also, the importance of the First 1000 Days of life should be emphasized among WRA.





# IODIZED SALT TESTING FOR THE EXPANDED NATIONAL NUTRITION SURVEY

Mario V. Capanzana, Ph.D, Imelda A. Agdeppa, Ph.D, Marina B. Vargas, Ph.D.†, Charina A. Javier, Glenda P. Azaña, Ma. Lilibeth P. Dasco, Charmaine A. Duante, Rosemarie J. Dumag, Dave P. Briones, Marites V. Alibayan, and Cheder D. Sumangue



Fortification of salt with iodine has been widely used to prevent consequences associated with iodine deficiency. Significant changes have been made in reducing the percentage of the population suffering from iodine deficiency in the Philippines through the ASIN Law enacted in 1995. Since then, continuous monitoring of the iodine level in salt at the household level was done to track compliance to the program through the conduct of national nutrition surveys by the DOST-FNRI.

This study determined the awareness and usage of iodized salt as well as the percentage of households using adequately iodized salt or with  $\geq 15$  parts per million of iodine in the salt.

Results of the 2018–2019 ENNS showed that

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**Awareness and reported usage of iodized salt were relatively high among Filipino households, but only 1 in every 3 households was using adequately iodized salt.**

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63.4% of Filipino households were using rock salt, 28.7% were using fine salt and 7.7% were using both rock and fine salts. Common source of both rock and fine salts was market or *talipapa*.

Awareness on iodized salt among households in the 2018–2019 ENNS was similar with the reported awareness in 1998 at 67.3%. Among those who were aware, reported usage of iodized salt was 59.5%. On iodized salt knowledge, more than half reported that it was cleaned or refined.



Based on the WYD test, only 36.0% or about 4 in every 10 households were using adequately iodized salt. Households in urban areas had higher percentage of usage than rural. By wealth quintile, the richest households had the highest percentage using adequately iodized salt.

Meanwhile, results of the 2021 ENNS revealed that majority of households were using rock salt (69.3%) and only a few were

using both rock and fine salt at 7.8%. Rock salt was mostly purchased from sari-sari store while market or *talipapa* was the common source for fine salt. Reported awareness and usage of iodized salt were 64.9% and 55.7%, respectively. However, only 33.2% of the households were using adequately iodized salt. Urban dwellers and the richest households have higher usage of adequately iodized salt than their counterparts.

The two survey results showed that awareness and reported usage of iodized salt were relatively high among Filipino households. However, only one in every three households was using adequately iodized salt based on the WYD test.

Above results call for the following actions: there is a need to review the current implementing rules and regulations of the ASIN Law for proper implementation at the national and local levels. Also, strong partnership with food industries including SMEs salt producers is needed such that proper salt iodization will be implemented. These actions will help ensure that adequately iodized salt will reach the households for consumption. Moreover, there is a need to strengthen the promotion and advocacy on the use of iodized salt as well as consumption of iodine-rich foods to prevent iodine deficiency.





# ENNS REGIONAL LEVEL ESTIMATION PROCEDURE

Ma. Lynell V. Maniego, Charmaine A. Duante, Glen Melvin P. Gironella,  
Eldridge B. Ferrer, Apple Joy D. Ducay, Cheder D. Sumangue,  
Imelda Angeles-Agdeppa, Ph.D. and Arturo Y. Pacificador, Jr., Ph.D.

## ENNS Survey Design

ROLLING  
SURVEY for  
3YEARS

40 Provinces &  
HUCs for 2018  
39 Provinces &  
HUCs for 2019  
37 Provinces &  
HUCs for 2021



**Target households (HHs) per domain is average of 1,536 HHs**

The DOST-FNRI is mandated to define and update the food and nutrition situation of Filipinos particularly children and other nutritionally vulnerable groups (Executive Order 128 Section 22, dated January 1987). In compliance with this mandate, the DOST-FNRI conducts the National Nutrition Survey (NNSs) and Updating Survey that generate critical data at the national and regional level for decision-making of the government and the private sectors (EO 352 dated January 1996), as these serve as inputs to national and regional plans and programs.

With the devolution of health and nutrition programs and services to local government units (LGUs), there has been a clamor for LGU-level data, notably from the

LGUs and from Congress. The DOST-FNRI has proposed for the change in the design of the survey to provide reliable national level estimates every year for national planning and monitoring and to provide reliable province or domain level estimates for local planning of specific and sensitive interventions. In 2018, the PSA Board issued PSA Board Resolution No. 06, s. 2018 that approves the adoption of the new design for the conduct of the Expanded National Nutrition Survey (ENNS).

The ENNS survey design is termed as a “rolling survey” wherein the data collection was done for a period of three (3) years (2018 to 2020). With this design, the ENNS is expected to generate unbiased national level estimates of acceptable precision



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**The ENNS regional estimates were derived using the 3 year-round of the ENNS from 2018 to 2021.**

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for every year for national planning and monitoring. A total of 40 provinces and HUCs for 2018, another set of 40 provinces and HUCs for 2019 and 37 provinces and HUCs for 2020 are targeted to be surveyed. However, the last year of the ENNS was scheduled in 2020 but because of the COVID-19 pandemic, the data collection was terminated and rescheduled in 2021.

The ENNS was primarily designed to provide domain and national level estimates. However, the survey design limits the generation of direct regional level estimates. Thus, no direct regional level estimates can be generated. The regional estimates are being used for monitoring regional targets for SDGs, PPAN, PDP and other related programs. Regional estimates provide vital inputs in

the conceptualization and prioritization of programs for nutritional improvement of the country's vulnerable population groups at all levels of intervention. Thus, this study aimed to determine the estimation procedure for calculating reliable regional level estimates of selected food, nutrition and health indicators of the ENNS.

This study utilized the secondary data of the ENNS collected in 2018, 2019 and 2021 by the DOST-FNRI. It also utilized the 2008 and 2013 NNS, and the 2015 Updating Survey data for comparison of estimates. Calculation of regional estimates were done in three (3) different procedures which includes: (i) comparison of covered and uncovered areas in ENNS 2018-2019 vs previous surveys; (ii) generation of new adjustment computation using the 2015 Updating Survey data which includes different comparison and calibration of estimates; and lastly (iii) the pooling of the three-year rounds of the ENNS.

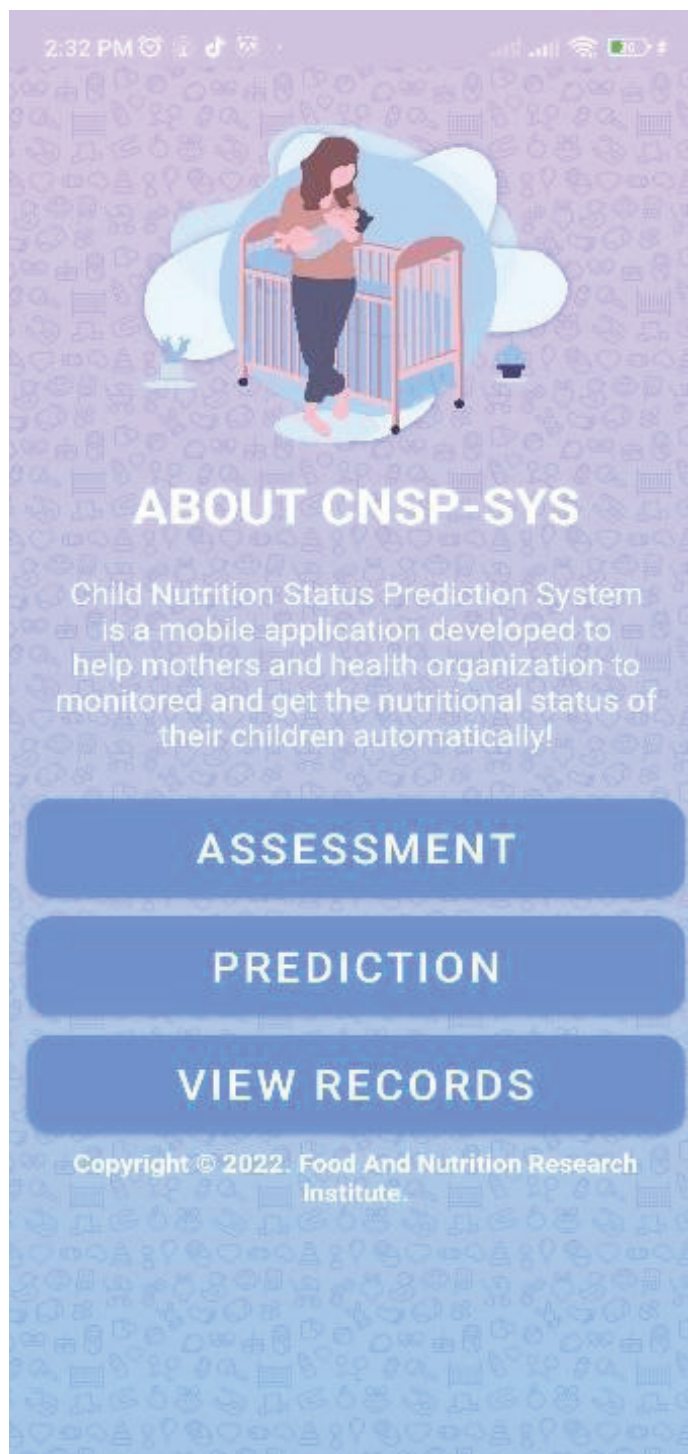
Findings of the study showed that the estimates at the national level showed no significant differences across the three (3) survey years, thus, pooling of estimates to generate regional level estimates is possible. The best synthetic estimates at the regional level is the pooling of the 3-year survey rounds of the ENNS. Further testing of the assumptions using different nutrition survey indicators is recommended.





# PREDICTING MALNUTRITION AMONG CHILDREN UNDER FIVE YEARS OLD WITH THE USE OF CLASSIFICATION TECHNIQUES IN DATA MINING

Mae Ann S. A Javier, Charmaine A. Duante, Ma. Lilibeth P. Dasco, Apple Joy D. Ducay, Kelvin Andrew D. Kua, Ryan Christian Brosa, Peter John L. Gerero, and Imelda Angeles-Agdeppa, Ph.D.



The 2015 National Nutrition Survey (NNS) data of DOST-FNRI revealed that stunting among children below 5 years old (0-59 months) was recorded to be very high at 33%, and during the same time, wasting was around 7% of children in 2015. This is estimated to be 1.5 million children wasted, and a third of these (500,000) were classified as severely wasted. In 2019 the Expanded National Nutrition Survey, stunting remains classified as “medium to high” severity for public health significance, since 28.8% of children are suffering from growth retardation.

To effectively address these concerns, it is important to identify those children at-risk through surveys, mainly anthropometric measurements, biochemical analysis and interviews that will be the basis to initiate timely nutrition intervention. Activities such as Operation Timbang (OPT+) is a proven strategy to do this but it requires elaborate planning and execution. A number of studies has explored using data mining techniques to predict malnutrition among children using malnutrition variables that can be gathered in the absence of highly trained field researchers and specialized tools.

The study explored creating a malnutrition prediction model that can be deployed in mobile devices. Extensive literature review of similar studies were conducted to formulate and test the most accurate machine learning algorithm and feature

selection method to build the model. Pre-processed dataset of children between 0-23 and 24-59 months from the 2018-2019 ENNS were used through the web-based computing platform Jupyter. The developed model was then uploaded to Google Cloud Run to serve as the hosting platform in order to be usable in mobile devices.

This study aims to support on-going and current strategies being deployed to identify and alleviate malnutrition among Filipino children. Through this application, concerned stakeholders will be able to accurately predict the children's nutritional status and plan necessary interventions when conventional means are not feasible.

Based on the results of the testing and training of the model, Random Forest Classifier and ExtraTreesClassifier were found to be the most accurate algorithm and feature selection method respectively. The model exhibited prediction accuracy average of 85% and 80% for 0-23 and 24-59 months samples respectively. The results showed promising malnutrition prediction capabilities of the model without anthropometric and biomarkers, instead focusing on variables such as birthweight, age of child and mother, employment status and household size in determining the likelihood of the child to be malnourished.

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**Through this application, concerned stakeholders will be able to accurately predict the children's nutritional status and plan necessary interventions when conventional means are not feasible.**

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# DEVELOPMENT OF NUTRITION SURVEY DATA WAREHOUSE SYSTEM

Mae Ann S.A. Javier, Charmaine A. Duante, Ma. Lynell V. Maniego,  
Eldridge B. Ferrer, Owen John de Leon, Imelda Angeles-Agdeppa, Ph.D.

The DOST-FNRI has a rich collection of survey data on food, nutrition, and health that provides evidence-based data to various stakeholders such as government and non-government agencies, food industries, the academe, and public clientele. Voluminous data from nationwide surveys are being managed by the Nutrition Statistics Informatics Section (NSIS) of the Nutritional Assessment and Monitoring Division (NAMD).

Moreover, while printed questionnaires were the norm, filing and managing physical forms required a large amount of paper documents and physical space, while being at risk of being lost, damaged and misfiled. Some nutrition survey documents like questionnaires and manuals of instruction are still in printed format. There are also documents or data already in digital format that are stored separately in different locations. Due to the diversity of the data types, locations, and sources, users found that the varied data requests were becoming more cumbersome.

The need for nutrition information nowadays has become more and more evident. The importance of nutrition knowledge for one's overall health outcome has been proven time and time again as seen in several studies (Soederberg Miller & Cassady, 2015; Nana, A. & Zema, T., 2018). A study done by Quaidoo, et al. (2018) found that the most popular source for young adults is online resources. Thus, it was recommended that health-

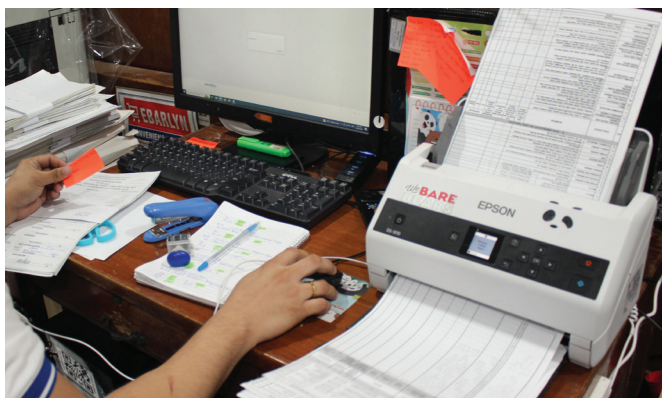
related professionals adopt this channel to circulate information to the age group.

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**To address the need for the preservation and presentation of nutrition information, the DOST-FNRI has developed the Nutrition Survey Data Warehouse System, a repository for storing data gathered from the many sources of the Institute.**

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To address the need for the preservation and presentation of nutrition information, the DOST-FNRI has developed the Nutrition Survey Data Warehouse System, a repository for storing data gathered from the many sources of the Institute. This system was designed to provide data users a centralized access to the integrated data of the National Nutrition Survey (NNS) and Updating of the Nutritional Status of Filipino Children and Other Population Groups Survey (Updating Survey) that could be used



for analyses, research, and evidence-based decision making or policy. The data warehouse system aims to establish a reliable and secure access to NNS or Updating Survey data, through the availability of public use files (PUF), remote data access and local data access.

The main objective of this project was to develop a nutrition survey data warehouse that will serve as a central repository of all nutrition survey data and related documents for fast and easy access, management and utilization of data. It also aimed to assist in preparing metadata for all nutrition survey data, and create PUFs and non-PUFs of such data. In addition, data security procedures and policies were provided to ensure the confidentiality, integrity, and availability of the data warehouse and its components.

Many sources of information, such as NNS surveys were scanned and stored in this repository. Moreover, accomplished survey forms are archived via the scanning and digitization system to minimize the office's storage area and the cost of its

maintenance and security. These are made easily accessible for users within the Institute. On the other hand, cleaned and standardized datasets and metadata of the previous NNS survey results in the form PUFs, infographics, facts and figures, presentations, monographs, and infographics are presented in the e-nutrition website ([enutrition.fnri.dost.gov.ph](http://enutrition.fnri.dost.gov.ph)) for the public to see and download. These are vital for data users, especially for analyses, research, and evidence-based decision-making or policy.

As it stands, this project remains to be a work in progress. Updates for the e-nutrition website and digitization system are initially done locally, then released after testing and debugging. While through the e-nutrition website, many data collected by the DOST-FNRI over the years are now accessible, and through the digitization system, files are more organized and secure within the department, these are continually updated and upgraded, to maintain security, convenience, and overall nutritional awareness of its many users.





# AR DIETARY ASSESSMENT TOOL: DEVELOPMENT AND IMPLEMENTATION OF DEEP LEARNING-BASED FOOD IMAGE RECOGNITION AND AUGMENTED REALITY DIETARY ASSESSMENT TOOL FOR THE ENNS DIETARY DATA COLLECTION

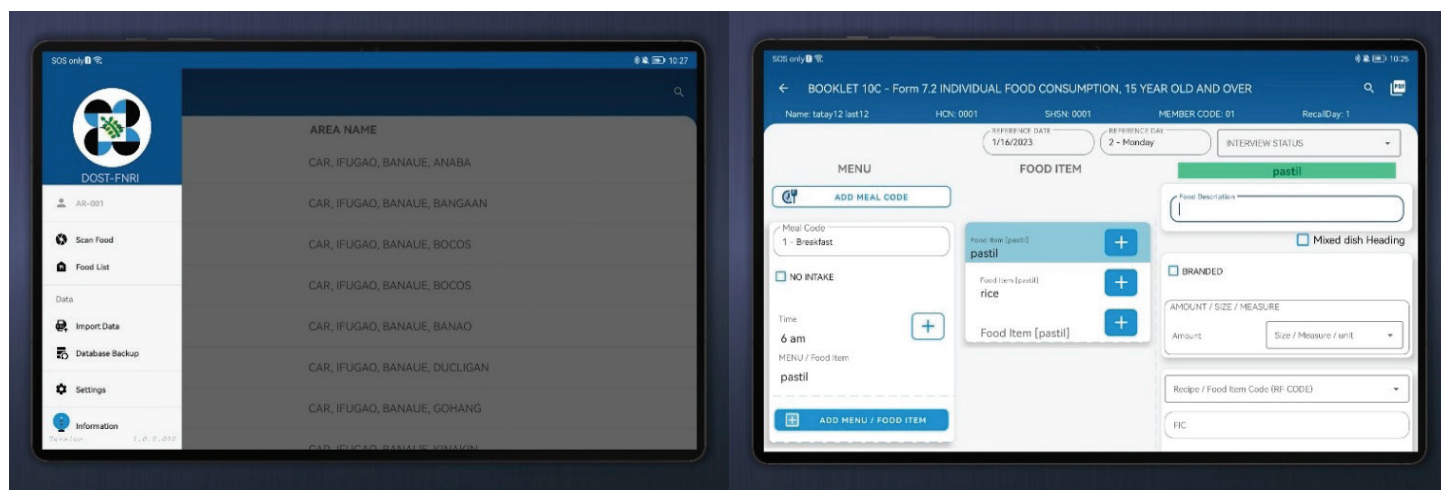
Mae Ann S. A. Javier, Charmaine A. Duante, Eva A. Goyena, Ph.D.,  
Josie P. Desnacido, Manolito G. Magnaye Jr., Kelvin Andrew D. Kua,  
Agape Paula D. Apolinar, and Imelda Angeles-Agdeppa, Ph.D.

The Dietary Component or the Food Consumption Survey (FCS) has been one of the major components of the National Nutrition Survey (NNS) since 1978. It is the country's primary source of data on food consumption and its implications on the nutrition situation of Filipinos. The FCS is the only official and recognized statistical source of data on household and per capita food consumption and nutrient intake in the country. Household food weighing, 24-hour food recall and food frequency questionnaires (FFQ) are the dietary assessment methods used in the FCS.

The DOST-FNRI developed a mobile application that employs augmented reality (AR) technology that recognize and estimate nutrients for food images captured using a mobile device. The AR

Dietary Assessment Tool is created on deep learning-based approach using machine learning model to accurately predict a captured food image. This model was created using local food image dataset to ensure accuracy and precision in recognizing staple Filipino foods based on the 2018–2019 ENNS data on most commonly consumed foods of Filipino households. In addition to this, the mobile app includes a fully digitalized forms used by DOST-FNRI to collect data on dietary practices of Filipino individuals across all age groups and household food consumption trends.

Together, these features aims to optimize the data gathering procedure, shifting from manual written collection to a fully modern, digital handheld devices that will expedite transfer, validation and analysis of dietary data. The developed food image



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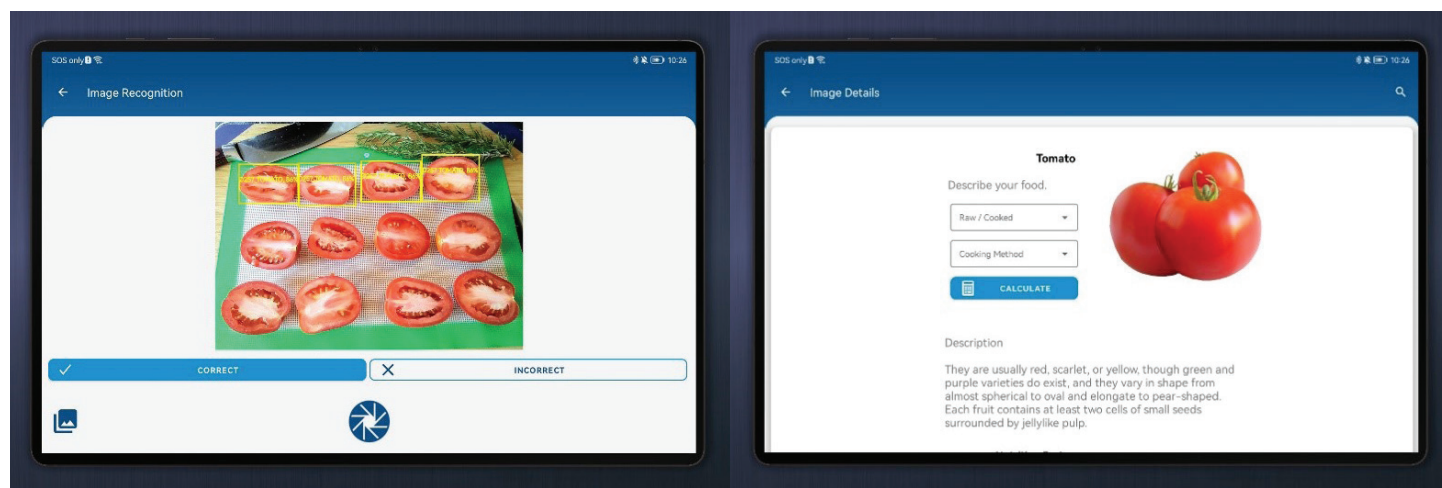
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recognition model scored a modest 76% on Precision metric in correctly identifying the food image which is at par with similar successful studies. Food image recognition technology is still considered novel and development is underway to improve its capabilities to be used in larger, public setting. This is also in-line with the project vision that the technology will be more accessible to the public to raise awareness.

At its current version, the app can recognize 40 kinds of staple food and together with the integrated database on nutrient content of these foods in the PhilFCT and estimate the macro and micro nutrient content of these foods.

Meanwhile, the fully digitalized individual and household food consumption survey forms has been pilot tested in urban and rural settings in the province of Rizal during the continuation of the 2022 ENNS cycle. Although adjustments and familiarization were cited since it is a new system, the application was well received by experienced field researchers and observers during the pilot testing.

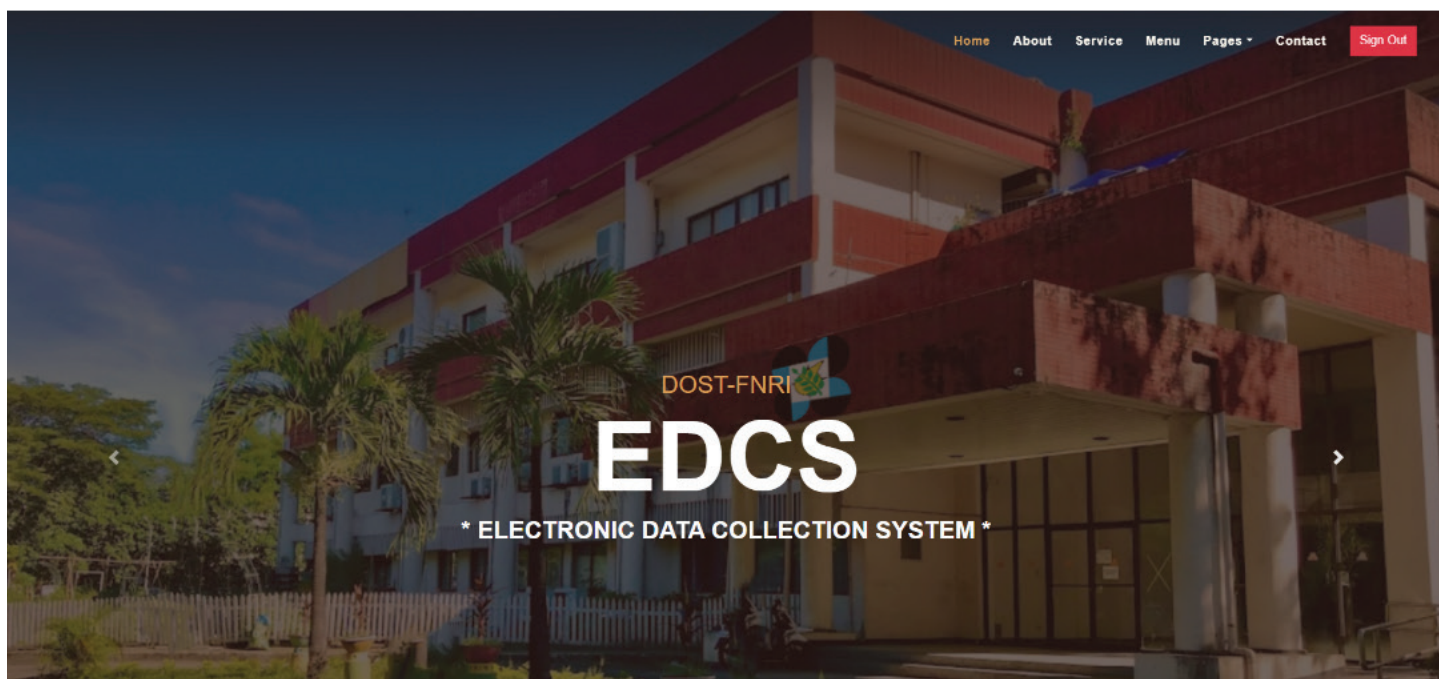
The successful launch of the AR Dietary Assessment Tool is a big step towards a more engaging and efficient food consumption data collection and dissemination. The study will continue to innovate and improve the system to cater to the needs of potential beneficiaries.





# EDCS INNOVATIONS: STREAMLINING THE ENNS DATA COLLECTION PROCESS

Mae Ann S. A Javier, Charmaine A. Duante, Owen John de Leon, Cristian C. Gonzales, Angelo M. Veraña, Ryan Christian B. Brosa, Manolito G. Magnaye Jr, Imelda Angeles-Agdeppa, Ph.D.



The National Nutrition Surveys (NNS) has been carried out for over 48 years as the Philippine government's primary statistical activity for the assessment of food and nutrient intakes, and nutritional status of Filipinos. Until 2011, pen-and-paper interviewing was the principal method for data collection, aside from household food weighing, measurement of weight and height, blood pressure measurement and extraction of blood and urine samples from survey participants. Using pen-and-paper interviewing has had many challenges, such as the increasing demand from users for more timely and reliable data, increasing cost of printing questionnaires, bulky field data collection paraphernalia carried from one site to the next, and respondent and researcher fatigue, among others. In 2013, following along with the increasing use of information technology globally, the DOST-FNRI shifted to an Electronic Data Collection System, or eDCS, with the objective of collecting and disseminating NNS data more efficiently.

This is especially important not only for government intervention and policy-making, but also for private sectors which plan for nutrition and development programs. Traditionally, all data were recorded in paper forms and questionnaires assigned per component and per household and individual. Now, the developers under the DOST-FNRI aimed to create a more secure, easier, and cost-efficient method to replace the traditional survey by implementing Computer Assisted Personal Interviewing (CAPI) functionalities in the form of the eDCS.

The EDCS, back when it was first implemented in 2013, had several problems. Every time the ENNS questionnaires needed to be updated, this version had manually-coded questions which made it inconvenient for developers to change. This eDCS was also a large system that consisted of every component required for the ENNS, which meant that it was also harder for researchers to navigate through

it. A system that allows for updating the survey questionnaires as needed is deemed an essential feature that needed to be incorporated. Further improvement to this version was required to become more efficient, more reliable, and more convenient.

Developers of the DOST-FNRI sought for these changes. Now, the updated eDCS is a CAPI system with its own question creation and editing, skip function, and various data tools such as upload, download, and transmission. This version of the system contains functionality and user interface upgrades separated into Anthropometry, Biochemical, and soon, Dietary, further divided into several forms. With the Form Generator, question generation and skip programming with the eDCS is easier than ever before. Using the Data Validation, users

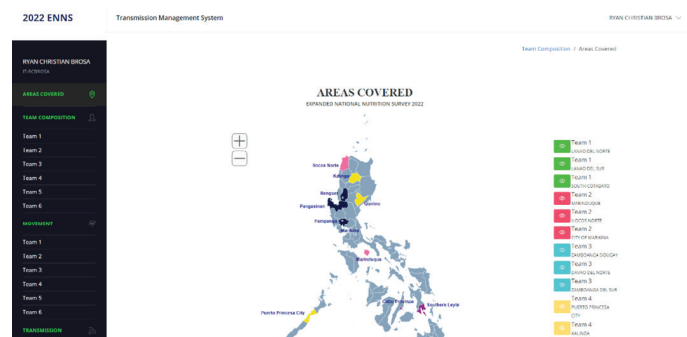
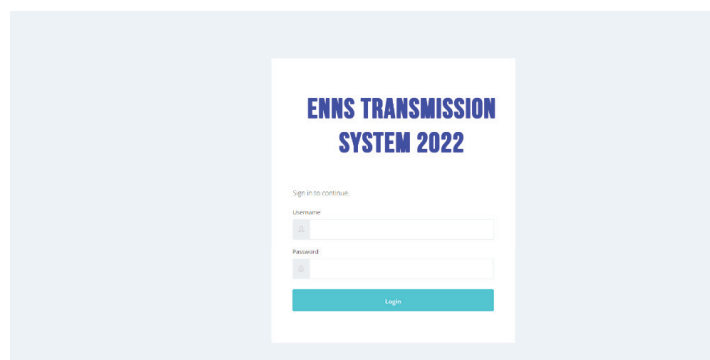
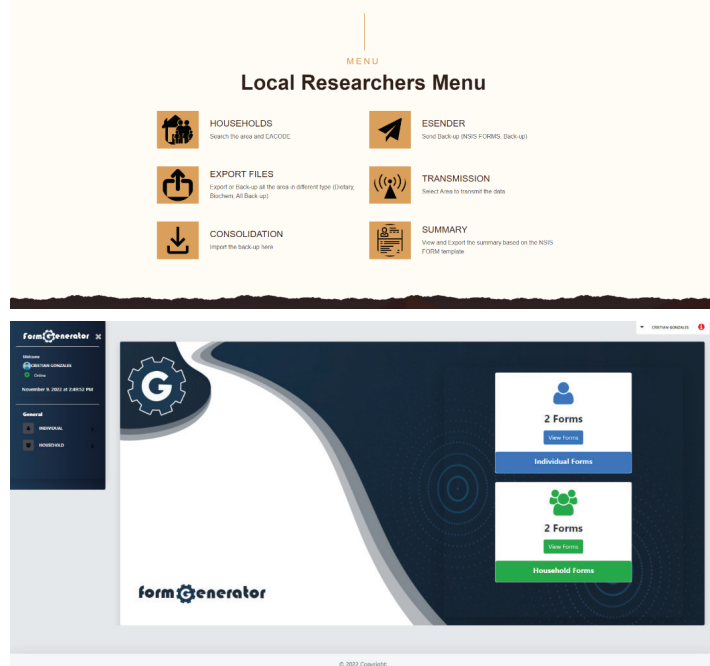
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The system is capable of supporting the ENNS, and will continue its improvement through the many continual user feedback it receives.

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are able to more reliably check for errors. Through the eSender, researchers in need of IT support are able to conveniently send most types of files as a backup measure. And, with the recent development of the Transmission Management System (TMS), monitoring is made possible, providing a real time overview of the various transmissions done.

Through descriptive analysis based on its users' continual feedback and recommendation, the eDCS is progressively updated, especially for its usability and navigation, system performance and portability, security, and visual design. The system is able to support interviews during the ENNS and receive positive feedback, Visual Design garnering the highest acceptability rating. Overall, the system is capable of supporting the ENNS, and will continue its improvement through the many continual user feedback it receives.





# DEVELOPMENT AND VALIDATION OF ADULT-MALE EQUIVALENT (AME) DISTRIBUTION FOR FILIPINO HOUSEHOLDS AND ITS APPLICATION TO THE HOUSEHOLD FOOD CONSUMPTION SURVEY

Charmaine A. Duante, RMT, MSc Epid.(PH), Apple Joy D. Ducay,  
Ma. Lynell V. Maniego, and Cheder D. Sumangue

Household Food Consumption Surveys (HFCS) are conducted to assess actual food consumption. In the Philippines, household food consumption is directly measured using a one-day food weighing technique to determine the food intake, energy and nutrient adequacy. However, this method does not account the age, body size, and physical activity of the individual members of the household which varies from member to member. This can be addressed by developing adult-male equivalent (AME) distribution among Filipino households to express household food intake accounting for the household composition in terms of age, sex, and physiological status. It may also enable direct comparison of food or energy intakes across households of different sizes and compositions. This study aimed to generate and validate the adult-male equivalent (AME) distribution using the 2019 Expanded National Nutrition Survey on Household Dietary Survey. AME distribution served as a tool in the computation of per capita and energy and nutrient intake.

The per capita food and nutrient intake was computed by dividing the total food weight consumption with the total number of consumption units regardless of age, sex, energy requirements, and physiological status of each household members. Consumption unit is defined as the total number of major meals consumed in a day divided by the meal pattern of the household.

The AME reference scale was derived from the mean energy requirements for men, 19-29 years of age, with reference value of 2,530 kcal from the 2015 Philippine Dietary

Reference Intake (PDRI). The AME units were determined by calculating the ratio of the energy requirements and the estimated adult reference value.

The findings of this study showed that the AME distribution was not significantly different compared with per capita intake for specific population groups, such as children (10-12y), adult females (20-29y), elderly males (70 years old and above), pregnant women age 13-18y and lactating mothers age 13-15y. However, among

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**The use of AME unit may provide a more appropriate estimation of the individual energy intakes from household surveys.**

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children, 6 months to 9 years old and female adults aged 30 years old and above, energy intake based on AME is significantly lower than the per capita energy intake. Moreover, the energy intake from other age groups based on AME is significantly higher than their per capita energy intake.

The use of AME unit may provide a more appropriate estimation of the individual energy intakes from household surveys.

Life stage/ Age group	Energy Requirement (kcal) <sup>a</sup>		Adult Male Equivalent conversion factor		Mean Energy Intake (kcal)					
					Male			Female		
	Male	Female	Male	Female	Per Capita	AME	AME modified with CU	Per Capita	AME	AME modified with CU
<b>Infant</b>										
6-11m	720	630	0.28	0.25	1356 (1310-1401)	552 (535-570)	551 (533-570)	1334 (1288-1380)	481 (465-497)	479 (462-496)
<b>Children</b>										
1-2y	1000	920	0.4	0.36	1392 (1371-1413)	764 (752-775)	774 (762-786)	1397 (1376-1419)	709 (698-720)	723 (712-735)
3-5y	1350	1260	0.53	0.5	1441 (1425-1457)	1045 (1033-1056)	1062 (1050-1075)	1399 (1383-1416)	962 (952-973)	976 (964-987)
6-9y	1600	1470	0.63	0.58	1479 (1466-1493)	1237 (1226-1247)	1253 (1241-1264)	1453 (1439-1467)	1136 (1125-1146)	1150 (1139-1161)
10-12y	2060	1980	0.81	0.78	1521 (1505-1538)	1548 (1532-1563)	1563 (1547-1580)	1510 (1493-1526)	1495 (1479-1510)	1510 (1494-1527)
13-15y	2700	2170	1.07	0.86	1568 (1550-1586)	1954 (1933-1974)	1954 (1932-1976)	1513 (1495-1531)	1596 (1578-1615)	1600 (1581-1619)
16-18y	3010	2280	1.19	0.9	1569 (1548-1589)	2124 (2100-2148)	2095 (2069-2121)	1499 (1478-1520)	1642 (1621-1663)	1630 (1607-1652)
<b>Adults</b>										
19-29y <sup>b</sup>	2530	1930	1	0.76	1517 (1502-1532)	1895 (1880-1911)	1829 (1812-1847)	1475 (1459-1491)	1497 (1483-1511)	1469 (1453-1484)
30-49y	2420	1870	0.96	0.74	1536 (1524-1547)	1867 (1855-1879)	1832 (1819-1845)	1569 (1558-1581)	1467 (1457-1477)	1474 (1463-1484)
50-59y	2420	1870	0.96	0.74	1661 (1642-1681)	1884 (1864-1904)	1892 (1870-1913)	1654 (1636-1672)	1486 (1471-1502)	1516 (1500-1532)
60-69y	2140	1610	0.85	0.64	1654 (1631-1676)	1748 (1725-1771)	1777 (1753-1801)	1632 (1611-1652)	1362 (1344-1379)	1397 (1379-1415)
>=70	1960	1540	0.77	0.61	1601 (1572-1631)	1614 (1584-1643)	1646 (1615-1676)	1538 (1516-1561)	1272 (1252-1291)	1299 (1279-1319)

<sup>a</sup> According to 2015 Philippine Dietary Reference Intake (PDRi)

<sup>b</sup> Age Bracket used as the reference for establishing an adult's mean energy requirement

### Mean energy intake based on per capita, AME, and AME modified with CU by age and sex. Philippines, 2019

Life stage/ Age group	Pregnant Women (2nd and 3rd Trimester) <sup>c</sup>						Lactating Mothers <sup>d</sup>			
	Energy Requirement (kcal) <sup>a</sup>	Adult Male Equivalent conversion factor	Mean Energy Intake (kcal)			Energy Requirement (kcal) <sup>a</sup>	Adult Male Equivalent conversion factor	Mean Energy Intake (kcal)		
			Per Capita	AME	AME modified with CU			Per Capita	AME	AME modified with CU
13-15y	2470	0.98	1846 (1614-2078)	1856 (1689-2022)	1856 (1689-2022)	2670	1.06	1362 (1028-1696)	1782 (1339-2226)	1758 (1411-2105)
16-18y	2580	1.02	1515 (1352-1678)	1853 (1675-2030)	1792 (1600-1984)	2780	1.1	1409 (1288-1529)	1865 (1723-2007)	1865 (1716-2013)
19-29y	2230	0.88	1544 (1484-1603)	1698 (1641-1756)	1725 (1663-1788)	2430	0.96	1466 (1437-1494)	1832 (1800-1863)	1860 (1827-1893)
30-49y	2170	0.86	1480 (1418-1541)	1610 (1547-1673)	1632 (1567-1697)	2370	0.94	1416 (1388-1444)	1744 (1712-1775)	1769 (1737-1802)
50-59y	2170	0.86				2370	0.94	1321	1607	1607

<sup>a</sup> According to 2015 Philippine Dietary Reference Intake (PDRi)

<sup>c</sup> Additional 300 kcal for pregnant women (2nd and 3rd trimester only), according to 2015 PDRi

<sup>d</sup> Additional 500kcal for Lactating Mothers, according to 2015 PDRi

### Mean energy intake based on per capita, AME, and AME modified with CU by age and physiological Status. Philippines, 2019





# MUNICIPAL LEVEL ESTIMATION OF STUNTING AMONG UNDER 5 YEARS OLD CHILDREN

Glen Melvin P. Gironella and Cheder D. Sumangue

Past National Nutrition Surveys (2013, 2015, 2018–2022) of DOST-FNRI were designed to provide national, regional and provincial or highly urbanized city (HUC) estimates of prevalence of stunting among children under 5 years in the Philippines.

Past nutrition survey results dissemination showed that some local government units are inquiring if the nutrition survey could provide municipal level results.

Median sample sizes were 11 and 20 children at the municipal level from the 2015 Updating of the Nutritional Status of Filipino Children (Updating Survey) and Expanded National Nutrition Survey (ENNS), respectively. Clearly the sample size was not adequate in generating prevalence of stunting at municipalities.

Small area estimation (SAE) are statistical methods that aims to provide reliable estimates by borrowing information from related data at area level (municipal) from census or administrative data results, or at the unit level (individual) from survey data sets.

The study aimed to explore if the Elbers Lanjouw and Lanjouw (ELL) method could generate stunting prevalence estimates at the municipalities.

Height-for-age z-scores were modelled using the following: age and sex of child, household head working in agriculture, household size, presence of improved water source and electricity in household

(HH), wall of housing unit, type of area (in urban or rural), with overseas worker in the family, with college educated women in HH, and number of men and women in the HH.

R-square of height-for-age z-score was 0.11. Generating SAE from a low R-square model was not recommended. Other SAE model or inclusion of other variable should be considered in generating estimates of stunting at using higher R-square model.

Take away:

Using other variables from Census data or from administrative sources could be explored to improve the statistical model and have reliable estimates of stunting in municipalities from SAE methods.

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**Small area estimation (SAE) are statistical methods that aims to provide reliable estimates by borrowing information from related data at area level (municipal) from census or administrative data results, or at the unit level (individual) from survey data sets.**

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	Region	Province	Municipalities/ Cities
<b>2015 Updating Survey</b>			
<b>No. of children under 5</b>			
Mean	986.1	199.6	14.9
Min.	536	12	1
Max	1613	641	282
Median	876	173	10
P25	815	85	6
P75	1109	300	18
<b>Stunting prevalence</b>			
Mean	35.3	36.3	35.1
Min.	23.1	15.9	0
Max	45.2	60.0	100
Median	36.7	36.1	33.4

Summary no. of children and prevalence of stunting per region, province and municipalities and cities from 2015 Updating Survey





# EVALUATION OF NUTRITIONAL ADEQUACY AND BIOMARKERS ASSOCIATED WITH STUNTING: ANALYSIS OF DATA FROM THE 2019 NATIONAL NUTRITION SURVEY

Imelda Angeles-Agdeppa, Ph.D., Cristina G. Malabad, Ma. Lynell V. Maniego, Cheder D. Sumangue, Apple Joy D. Ducay, and Ma. Evette B. Misagal



Eradication of all forms of malnutrition has long been a battle worldwide. Stunting which is a chronic form of undernutrition is of critical concern for public health nowadays.

Over the past decades, the Philippines experienced reductions in the prevalence of stunting and underweight among the under-five children but fall short to achieve national aspirations and goals. In the

2019 Expanded National Nutrition Survey (ENNS), stunting prevalence was 29.5% among children under-five years old. This study aims to assess and evaluate the determinant factors of stunting.

The data of 3,684 children aged 1 to <5 years was utilized to evaluate the food and nutrient intakes, and the biomarkers of Filipino children. All relevant independent variables on socio-economic, demographic, anthropometric, nutrition biomarkers, and food intake logically known to be linked with height status were considered as variables of interest.

Serum samples collected from these children during the same survey period were utilized to analyze undercarboxylated osteocalcin (ucOC) and amino acid (AA) concentrations for sub-samples of 350 and 200 children, respectively. These sub-samples of children were randomly selected and proportionately distributed according to age and stunting status.

Results showed that the prevalence of stunting was 31.4%. More stunted children were observed from the poorest to middle income groups while significantly more non-stunted children were noted from the rich and richest wealth than in poorest and poor wealth quintile groups. Likewise, more stunted children were seen among households with more than 5 members than those with less than 5 members (33.8% vs. 28.4%,  $p$ -value 0.035). Stunting prevalence were also observed to be significantly different across different levels of household head educational attainment as more stunted children were noted

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Poor socio-economic status, low intake of food sources of high biologic-value proteins like **Meat and Products** and **Milk and products** remains significant factors of becoming stunted. In addition, intake of bone-related nutrients such as vitamin D and phosphorus as well as vitamin K nutriture as indicated by serum undercarboxylated osteocalcin concentrations are potential determinants of height status.

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among low levels of education (no grade completed and attained a level in primary education only). By intake of different food groups, 31.1% among non-stunted consumed **Meat and Products** while 26.8% among stunted children. Mean daily intake of **Meat and Products** was significantly higher among non-stunted (22.9g) versus stunted (18.6g). Similar observations in the intake of **Poultry, Eggs** and **Milk and Products** food groups were observed with higher percent of children consuming and mean daily intake among non-stunted children. By intake of energy adjusted nutrients, stunted children had significantly (p-value <0.05) lower mean intake than their counterpart on all the nutrients such as protein, iron, calcium, fat, vitamin c, thiamin, riboflavin, niacin, magnesium, zinc, vitamin E and D and phosphorus except for selenium.

Multivariate logistic regression model revealed that birthweight, energy-adjusted vitamin E and phosphorus intake are positive significant predictors of stunting

while belonging to the poorest and poor wealth quintiles, no educational attainment of household head and household size with more than 5 members likely to increase odds of being stunted.

Similar socio-economic factors found to be associated with stunting were observed based on sub-sample of children with ucOC analysis. Based on the data, findings showed that ucOC which is a known biomarker of bone turn-over and production is highly sensitive with vitamin K level, that its association to height status is not well-established using stunting as the dependent variable. However, significant effect to the model for linear growth was observed with ucOC level which tends to increase Height-for-Age Z-score (HAZ) with reducing levels of ucOC.

For evaluation of different AA, multiple models were built for predictors of height status, however, inconsistent effects of different AA in the model and weak strength of associations that was observed need further evaluation. Likewise, increasing the sample size for analysis should also be considered to increase precision and reliability of estimates.

In conclusion, this study provides comprehensive information on the contribution of serum ucOC and AA levels in understanding other factors that determine height status. Children in the poorest to middle-income households with more than five household members, and no grade completed or attained only primary level of education household heads are significantly associated with stunting. A higher proportion of anemic was found among stunted than non-stunted children. The study also revealed stunted children had lower intakes of foods with high biological value protein such as **Meat and Products**, **Poultry, Eggs** and **Milk and Products** than non-stunted children.

Strengthening the programs focusing on





maternal and child nutrition interventions including health and nutrition education and dietary diversification through scaling up the First 1,000 days or Kalusugan at Nutrisyon ng Mag-Nanay Act, through the promotion of consuming nutrient-

dense foods among children could help reduce stunting in the country. Further studies to determine status of vitamin K and amino acid nutriture and the potential contribution of these nutrients on stunting is needed.

Variables	Full Sample (n=3684)				Sub-sample (n=350)**			
	Adjusted Odds Ratio	Std. Error	95% Confidence Interval		Adjusted Odds Ratio	Std. Error	95% Confidence Interval	
			Lower Limit	Upper Limit			Lower Limit	Upper Limit
<b>CHILD'S CHARACTERISTICS</b>								
Birth weight (continuous)	0.667*	0.10	0.47	0.94				
Dietary Intake								
<i>Energy Adjusted Nutrients (continuous)</i>								
Vit E (µg/d)	0.927*	0.02	0.88	0.98	0.906*	0.0	0.8	1.0
Phosphorus (mg/d)	0.999*	0.00	1.00	1.00				
<b>HOUSEHOLD CHARACTERISTICS</b>								
Wealth Tertile								
1st tertile (Poor)	2.066*	0.47	1.21	3.53	2.930*	1.2	1.2	7.5
2nd tertile (Middle)	1.502*	0.25	1.01	2.23	1.620	0.9	0.5	5.7
3rd tertile (Rich)	Ref				Ref			
Household size								
1-5 members	Ref							
>5 members	1.268*	0.1	1.0	1.6				
Household Head Educational Background								
No grade level completed	1.762*	0.41	1.01	3.06	12.581*	8.3	2.7	59.4
Primary level	1.630	0.40	0.92	2.90	2.824	1.6	0.7	10.8
Secondary level	1.132	0.26	0.65	1.96	1.175	0.8	0.2	6.3
Tertiary and above	Ref				Ref			
<b>_cons</b>	0.533	0.2	0.196	1.447	0.272*	0.13	0.092	0.807

\*Significant at p-value<0.05

\*\*Serum ucOC concentration was analyzed only among a sub-sample of children

All individual factors included in model building were significant factors in the bivariate regression analysis.

Table 1. Predictors of stunting using multivariate logistic regression analysis

Variables	Full Sample (n=3684)				Sub-sample (n=350)**			
	Coefficient	Std. Error	95% Confidence Interval		Coefficient	Std. Error	95% Confidence Interval	
			Lower Limit	Upper Limit			Lower Limit	Upper Limit
CHILD’S CHARACTERISTICS								
Age (continuous)	−0.0755*	0.0182	−0.119	−0.032				
Birth weight (continuous)	0.0003*	0.0000	0.0002	0.0004				
Dietary Intake								
Energy Adjusted Nutrients (continuous)								
Carbohydrates (g/d) (continuous)	0.0011*	0.0002	0.0005	0.0017				
Zinc (mg/d) (continuous)	0.0002*	0.0001	0.0001	0.0004				
Iron (categorical)								
1st tertile (low)					−0.354*	0.1	−0.697	−0.011
2nd tertile (middle)					0.041	0.1	−0.284	0.367
3rd tertile (high)					Ref			
Biochemical Parameters								
Hemoglobin values (continuous)	0.1535*	0.0234	0.098	0.209				
Hemoglobin levels (categorical)								
1st tertile (low)					−0.443*	0.2	−0.862	−0.024
2nd tertile (middle)					−0.115	0.2	−0.489	0.259
3rd tertile (high)					Ref			
HOUSEHOLD CHARACTERISTICS								
Wealth Tertile								
1st tertile (Poor)	−0.4979*	0.1	−0.711	−0.285	−0.718*	0.2	−1.120	−0.317
2nd tertile (Middle)	−0.2636*	0.1	−0.476	−0.051	−0.232	0.2	−0.779	0.316
3rd tertile (Rich)	Ref				Ref			
Household Head Educational Background								
No grade level completed	−0.4195*	0.1	−0.726	−0.113				
Primary level	−0.2153	0.1	−0.450	0.020				
Secondary level	0.0168	0.1	−0.238	0.272				
Tertiary and above	Ref							
Mother’s Work Status								
Not Employed	−0.217*	0.1	−0.410	−0.023	−0.437*	0.2	−0.845	−0.028
Employed	Ref				Ref			
Serum concentration of ucOC**								
ucOC level								
1st tertile (low)					0.370*	0.1	0.023	0.717
2nd tertile (middle)					−0.037	0.2	−0.501	0.426
_cons	−3.531*	0.2	−3.989	−3.072	0.877*	0.26	−1.497	−0.258

\*Significant at p-value<0.05

\*\*Serum ucOC concentration was analyzed only among a sub-sample of children

All individual factors included in model building were significant factors in the bivariate regression analysis.

Table 2. **Predictors of linear growth (Height-for-age z-scores) using multiple linear regression analysis**







# TECHNOLOGY AND KNOWLEDGE DIFFUSION PROGRAM

# ANALYSIS OF TRANS-FAT CONTENT OF FATS AND OILS AND COMMONLY CONSUMED FOODS IN THE PHILIPPINES

Rosemarie J. Dumag, Dave P. Briones, Kristine B. Nacionales, Michael C. Pelagio, and Alexandra Lyne E. David

## METHODOLOGY

### E. Fat Extraction and *trans*-Fatty Acid Analysis

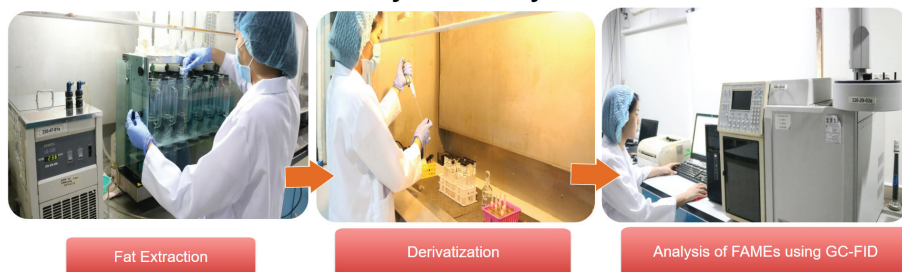


Figure 1. TFA analysis of collected food samples

Trans-fatty acids (TFAs) are naturally found in small amounts in ruminant animals, and they are produced by bacterial action in the stomach. The primary source of TFAs in the diet are those from industrial sources, in which edible vegetable oils such as palm, cottonseed, soybean, and canola oils are partially hydrogenated to form structure similar to those of saturated fat. Thus, TFAs are semi-solid at room temperature, and are particularly used in the food industry to enhance stability, shelf-life, and quality of food products. Unlike other fatty acids, industrially produced TFAs have no nutritional benefits for the body, and increased intake is associated with substantially increased people's risk of coronary heart diseases (CHDs). According to studies, TFA mainly elevates harmful low-density lipoprotein cholesterol levels and decreases protective high-density lipoprotein cholesterol. The World Health Organization (WHO) recommended TFA intake of less than 1% of the total energy for both adults and children. Reducing both saturated fatty acids (SFA) and TFA in the diet, while replacing them with polyunsaturated fatty acids (PUFA), reduces risk for CHDs. However, most countries still exceed the recommended TFA intake which mainly reflects industrial TFAs in processed food.

This study aimed to validate the TFA method of analysis and analyze at least 500 industrially-produced commonly-consumed food for moisture, total fat and TFA contents.

Food samples were collected from different markets or supermarkets of Metro Manila according to the ASEANFOODS sampling guideline. For processed foods, whenever possible, the most common brands were collected, and composite samples were prepared for triplicate analysis. Association of Official Agricultural Chemists (AOAC) official methods were used for moisture and fat analysis. For TFA analysis, modified AOAC and WHO global protocols were validated using gas chromatography equipped with flame ionization detector. Collected oils from the samples were derivatized and analyzed for TFA using the validated method as shown in Figure 1.

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**The validated TFA method of analysis provides sensitive and highly reproducible results and is useful for the determination of TFA in 567 industrially-produced commonly consumed food.**

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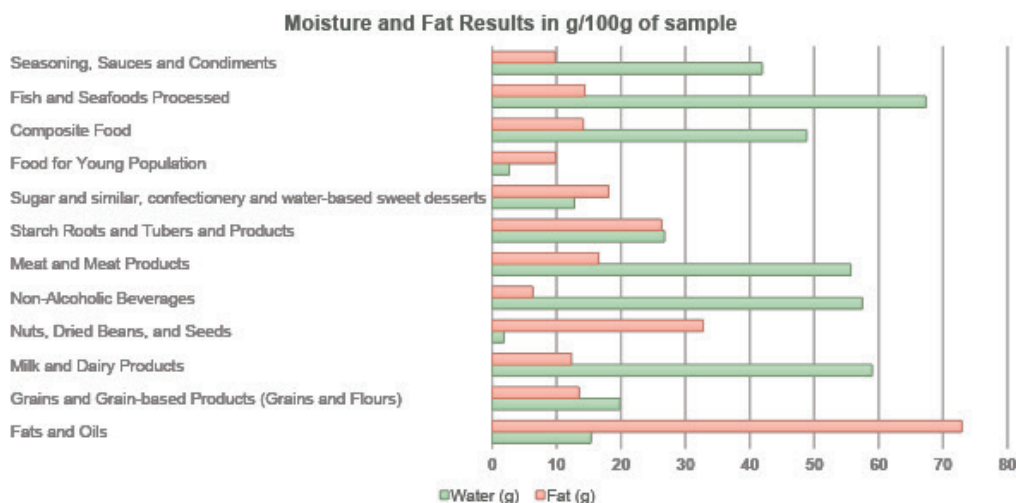


Figure 2: Average moisture and fat results of food samples in gram per 100 gram of sample.

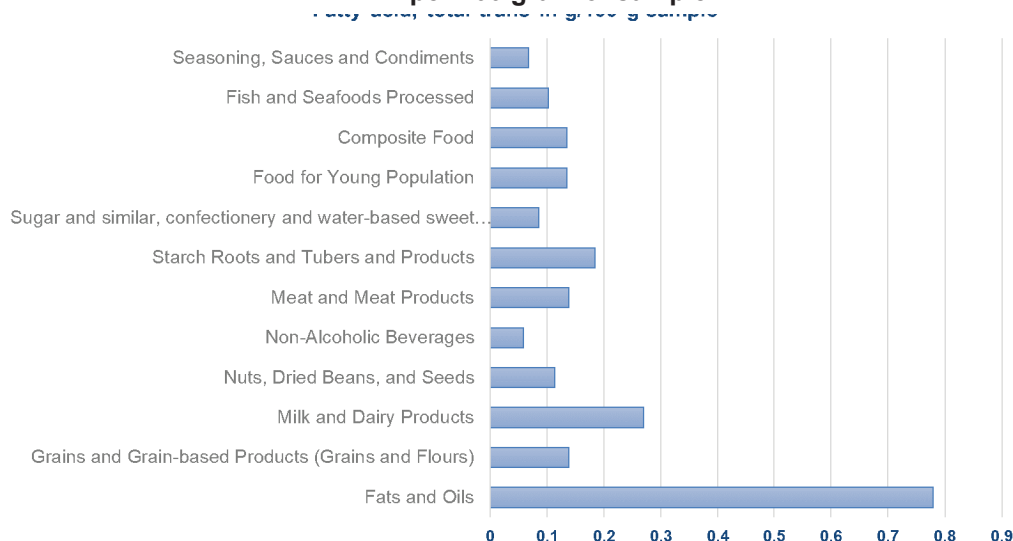


Figure 3: Average TFA results of food samples in gram per 100 gram of sample.

Summary of the performance characteristics: linearity and working range, detection limits (instrument and method), precision and accuracy showed that the method validated for TFA analysis was fit for its intended purpose. A total of 565 food samples across different food categories were collected, prepared and analyzed for moisture, fat and TFA contents.

Analyses of moisture and fat across all the food categories are summarized on Figure 2. Meanwhile, Figure 3 showed the average TFA results across food categories. Fats and oils had the highest average TFA of 0.78 g per 100g sample, followed by milk and milk products with 0.27 g per 100g

sample and starch roots and tubers and products with 0.18 per 100g sample. Lowest TFA contents were found in non-alcoholic beverages with 0.08 g per 100g sample.

Modified AOAC and WHO global protocols were successfully validated and were used to quantify TFA contents in commonly consumed foods. Based on the results of the study, policy-makers will enact regulatory actions that will lessen and eventually eliminate industrially-produced TFAs. A healthy alternative or replacement of industrially-produced TFAs will be promoted as

an initiative to eliminate production and lessen consumption of TFAs.

Acknowledgement: The project was financially supported by the Department of Science and Technology - Philippine Council for Health Research Development (DOST-PCHRD) and the WHO. Other Staff who contributed to the study are: Soledad G. Pepito, Patrice L. Mendoza, Giancarlo Antonio Dancel, Kim Andrea S. Cordez, Sitti Sarah D. Angkang, John Ceazar L. Benitez, Ruby Ann O. Rosales, Lian C. Cantal, FNRI Total Diet Study and Philippine Food Composition Tables Project Team.

# MALNUTRITION REDUCTION PROGRAM: MOVING FORWARD SUSTAINED IMPLEMENTATION PROJECT I: ROLL-OUT OF COMPLEMENTARY FOOD PROCESSING FACILITY (BATCH 3)

Alexis M. Ortiz, Imelda Angeles-Agdeppa, Ph.D., Milflor S. Gonzales, Ph.D., Jaypy S. De Juan, Lea B. Landicho, Ulpiano A. Florida, Engr. Charlie E. Adona, Engr. Eugenio M. Ramirez, Engr. Jayson G. Tagaroma, Richard L. Alcaraz, Filoteo D. Ponte, Janel Anne C. Eder, John Mark M. Villanueva, Alberto F. Malaki, Jr., and Tristan Gene D. Sario

The DOST-FNRI, being the lead agency in food and nutrition research, spearheaded the implementation of the Department of Science and Technology's (DOST) Malnutrition Reduction Program (MRP) in 2011 as part of the DOST's High Impact Technology Solutions (HITS).

The MRP is both supply (technology transfer of complementary foods component) and demand (nutrition intervention component through DOST PINOY) strategy.

The Philippine Plan of Action for Nutrition (PPAN) for 2017 – 2022 highlighted 39 priority provinces which require urgent and proper nutrition intervention to address the high prevalence of malnutrition among young children. The DOST's MRP is one of the strategies identified by the government for further implementation to alleviate the said problem.

In support to PPAN, the DOST funded, through the different councils of the DOST, several MRP program proposals. The latest of which is the Malnutrition Reduction Program: Moving Forward Towards Sustained Implementation; wherein the Roll-Out of Complementary Food Processing Facility (CFPF) (Batch 3) is one of the two projects.

The Roll-Out of CFPF (Batch 3) or Project 1 is a three (3) year project which monitored, evaluated and provided technical assistance to facilitate the upgrading/rehabilitation of facilities and/or equipment of the 37 CFPFs established in the regions through the previous batches of roll-out. Also, part of the project is the establishment

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Given the gains and challenges of the project, Roll-Out of Complementary Food Processing Facility (Batch 3), the Institute will continue to advocate and collaborate with various government agencies and the private sectors to address the problem of malnutrition among young Filipino children.

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of 8 new CFPFs in the Geographically Isolated and Disadvantaged Areas (GIDAs) identified as priority areas in the PPAN for 2017 – 2022.

The 8 priority areas are the provinces of Ifugao, Romblon, Catanduanes, Zamboanga del Norte, Lanao del Norte, Sarangani, Sulu and Tawi-Tawi.

Under Project 1, the beneficiaries in the 8 priority areas received equipment for the production of complementary foods (rice-mongo curls and rice-mongo blend). While some of the existing CFPFs were upgraded with the provision of additional equipment.

In determining the possible beneficiaries in the 8 priority areas, the project team had a series of consultative meetings with the officials and staff of the concerned DOST Regional and Provincial Offices. During those meetings, the criteria in identifying the possible beneficiaries were laid out.





Once the beneficiaries were identified and endorsed by the DOST Regional Offices another series of meetings and site visits were conducted.



The program proposal was approved in October 2018 with the funding assistance from DOST – Philippine Council for Health Research and Development (PCHRD) and supposed to end in October 2021. However, due to the COVID 19 pandemic some of the project activities were delayed especially the deployment of the equipment and the conduct of the technology transfer training. Hence, the project team requested for a one year extension which was favorably considered.

Although there are limitations in the project implementation during the pandemic, it does not prevent the project team in meeting its deliverables. They continuously coordinated with the beneficiaries on the status of the on-going construction repair or renovation of their proposed facility and even conducted virtual technology transfer training in some of the facilities.

The project team were able to achieve the following:

- Established and operationalized new medium scale complementary food production facilities;
- Trained the production staff of the complementary food production facilities;

- Provided technical assistance and support in the rehabilitation and/or upgrading of operational complementary food production facilities nationwide;
- Monitored and evaluated the product quality and compliance of the operational complementary food production facilities to Good Manufacturing Practices (GMPs);
- Established the DOST-FNRI guidelines on engaging the support of private sector to MRP under the National Economic and Development Authority National Priority Plan (NEDA-NPP) certification; and
- Established and monitored partnerships with private sector in the implementation of MRP.

While the project has officially ended on December 31, 2022, the project team will continue to accomplish the following deliverables:

- Pre-testing of the online monitoring platform among all the operational CFPFs; and
- Conduct of technology transfer training in Iligan City National High School and LGU – Panglima Sugala, Tawi – Tawi CFPFs.

Aside from the MRP being considered as one of the government's priority programs and was included in the NEDA-NPP for eight (8) consecutive years (2015 – 2022); it is also worth mentioning that the MRP bagged the 2021 Alberto G. Romualdez, Jr. Outstanding Health Research Award (AROHRA) in the Health Services Research Category.

Given the gains and challenges of the project, the Institute will continue to advocate and collaborate with various government agencies and the private sectors to address the problem of malnutrition among young Filipino children.

# MRP DOST PINOY CONTINUES TO ADDRESS THE UNDERNUTRITION PROBLEM AMONG INFANTS AND YOUNG CHILDREN

Julieta B. Dorado, Joanne Jette S. Gulay, Emily O. Rongavilla, Josefina T. Gonzales, Regina M. Pagaspas, Rowena V. Viajar, Celina Ann J. Navarro, Georgina S. Caraig, Nesrianne G. Buyco, Filipiniana B. Bragas, Czarina Teresita S. Martinez, and Marie T. Bugas, Ph.D.

In response to the prevailing undernutrition problem among Filipino infants and young children, the DOST-FNRI continuously promotes and monitors the science-based intervention called DOST PINOY (Package for the Improvement of Nutrition of Young Children) through the Malnutrition Reduction Program (MRP) which has been implemented in various provinces in the Philippines since 2012.

The DOST PINOY is a combination of feeding complementary foods made from local-based rice-mongo-sesame seeds among 6-23 months old infants and young children, and nutrition education among their mothers or caregivers utilizing modules on food, health, and nutrition.

The study covered the monitoring of the MRP DOST PINOY in provinces with newly established complementary food production facilities (CFPF) namely Ifugao, Catanduanes, Romblon, Sarangani, Lanao



del Norte, and Zamboanga del Norte. Selected municipalities in these provinces implemented the DOST PINOY in their respective barangays.

Prior to implementation, capacity building of nutrition focal persons and community workers (e.g. barangay nutrition scholars, and barangay health workers) in each study area was done. Twenty-one training-workshops were conducted which tackled modules on DOST PINOY implementation, basic nutrition, pregnancy, breastfeeding, complementary feeding, meal planning, food safety, and backyard gardening. This two-day activity was done on-site in 2019-2020 (pre-pandemic) and supervised remote lecture video recordings in 2021-2022 (during the pandemic).

Despite some of the challenges like the pandemic which started in March 2020 and the national election in May 2021, the DOST

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**The MRP DOST PINOY continues to contribute in addressing the undernutrition problem in several areas in the Philippines.**

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PINOY intervention, both complementary feeding, and nutrition education, was implemented in the municipalities of San Jose and San Andres in Romblon, and Alabel and Malungon in Sarangani. However, for the municipalities of Lagawe in Ifugao, Malapatan in Sarangani, and Kauswagan and Sultan Naga in Lanao del Norte, only the complementary feeding was conducted among 6–23 months old infants and young children. On the other hand, the municipalities of Virac and Pandan in Catanduanes were able to conduct nutrition education among mothers and caregivers with infants and young children. Results based on the records of local program implementers showed that 447 infants and young children benefitted from complementary feeding. About half of the children beneficiaries have improved nutritional status, from 149 underweight (UW) and 82 severely underweight (SUW) to 87 UW and 29 SUW at the end of the complementary feeding.

To ensure the sustainability of the intervention, the Provincial/City/Municipal Nutrition Committees (P/C/MNCs) passed a local ordinance/resolution on the adoption of the MRP DOST PINOY in their respective areas with yearly budget allocation for

its implementation. Relative to this, the municipalities of San Andres in Romblon, Lagawe in Ifugao, Piñan and President Manuel A. Roxas in Zamboanga del Norte, Virac and Caramoran in Catanduanes, and Malungon in Sarangani have adopted the intervention in their localities.

Among the factors which influenced the implementation of MRP in the areas were the support from the LGUs; cooperation and participation of intervention participants; and availability and accessibility of complementary food products. On the other hand, the hindering factors include: the prioritization of nutrition programs; compliance with the intervention; and unexpected scenarios like changes in weather conditions and the occurrence of a pandemic.

The MRP DOST PINOY continues to contribute in addressing the undernutrition problem in several areas in the Philippines. With the unceasing advocacy and promotion, capacitating of community health workers, adoption of the intervention through an approved local ordinance/resolution, and availability and accessibility of complementary food production, the sustainability of MRP can be achieved.



# BEHIND NUMBERS: ENGAGING MEDIA PARTNERS IN COMMUNICATING R&D RESULTS AND S&T SERVICES

Mr. Salvador R. Serrano, Ms. Idelia G. Glorioso, Dr. Milflor S. Gonzales, and Mr. Nichole M. Bristol

The DOST-FNRI diffuses knowledge and information packages on research and development (R&D) findings and outcomes, as well as science and technology (S&T) services and activities to the general public and specific clients through mass media, social media, seminars, trainings, workshops, fora, exhibits and other channels.

While publicity on the DOST-FNRI's products, technology, and services is impressive, as proven by the DOST-Science and Technology Information Institute's media mileage reports through the Mediameter service, the Social Weather Station (SWS) surveys, and the DOST-FNRI's own monitoring including social media metrics, there remains a need to boost knowledge diffusion efforts to influence more stakeholders with greater impact.

The project focused on maximizing exposure of DOST-FNRI's R&D results and S&T services through its existing and prospective quad-media partners.

## MEDIA PLACEMENT

The media collaterals developed by DOST-FNRI writers were revised based on the inputs and suggestions of media partners during the story conferences and consultations. Selected media collaterals were then framed, primed, and placed in various media networks.

The contract for the quad media service (Php 2,300,000.00) was awarded to Marnie Manicad Production, Incorporated (MMPI), a Philippine-based production company whose production include original television and online content for the local and international audience.

Overall, 29 quad media collaterals were placed by MMPI across TV, radio, print, and online (original target: 16 placements) with a **total media value of Php 25,749,600.00**.

## TELEVISION

Two (2) TV features were produced by MMPI that highlighted DOST-FNRI food technologies on Mealusog, Iron Fortified Rice, and Complementary Foods with Coconut. These were featured in 2 programs airing on GMA 7, namely: "Home Base Plus" and "Agripreneur". **Total media value is Php 18,463,000.00.**



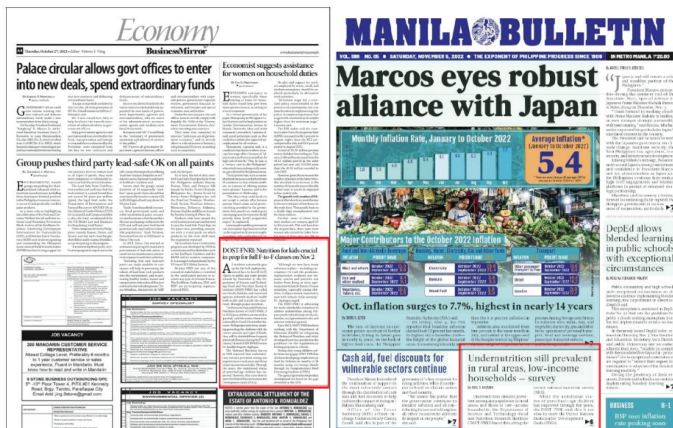


## RADIO

One (1) 60-second radio ad was developed and aired on DZRH and DZBB (<https://bit.ly/RadioADFNRI>). Total media value is Php 1,193,600.00.

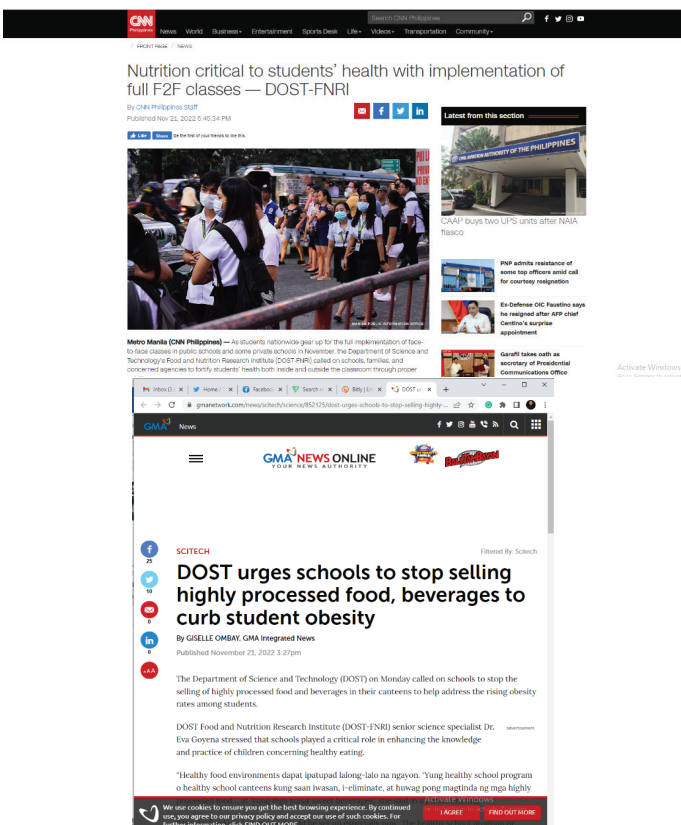
## PRINT

Three (3) press releases based on DOST-FNRI developed articles were placed in 7 broadsheets. Total media value is Php 330,000.00



## ONLINE NEWS

A total of 15 article placements were done across 13 online news sites. Total media value is Php 1,353,000.00.



## LIVE INTERVIEWS

Two (2) live interviews on CNN (Television) and DZXL (TeleRadyo) were arranged and conducted. Dr. Imelda Angeles-Agdeppa, DOST-FNRI's Director IV and Scientist IV, served as the interviewee for both. Topics discussed were DOST-FNRI's mandates and major programs. Total media value is Php. 4,700,000.00.



## FOOD AND NUTRITION MEDIA COLLATERALS

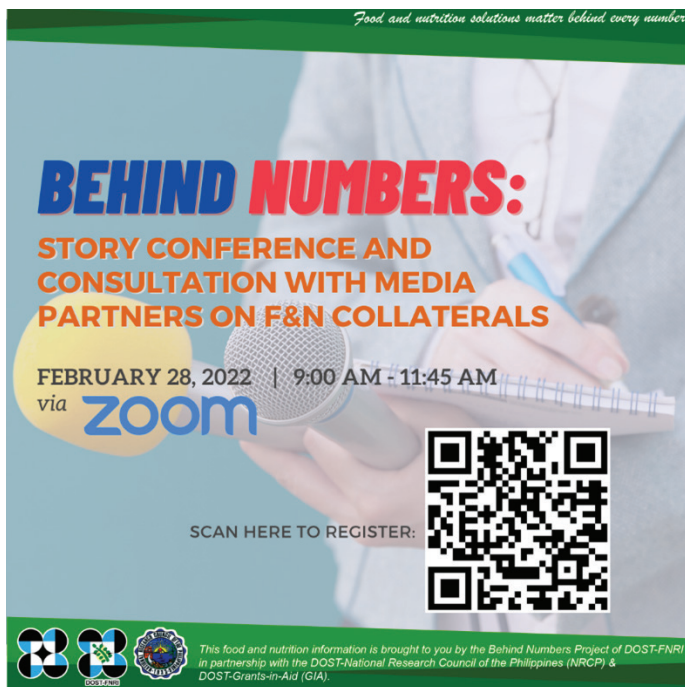
Based on the identified story line-up, the project generated a total of 115 articles in food and nutrition and 25 sets of infographics



## STORY CONFERENCES AND CONSULTATIONS

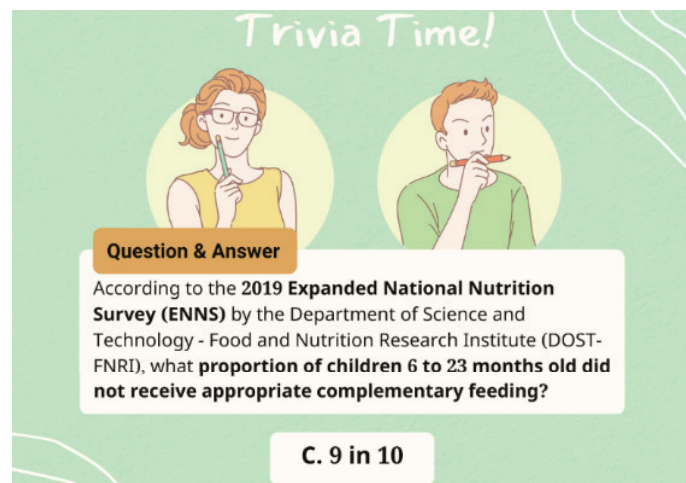
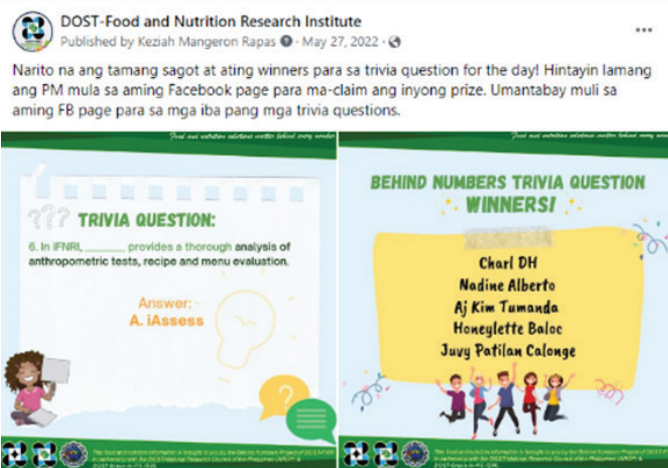
One of the activities of the project is the conduct of story conferences and consultations with media and communication partners and NUTRICOMNET members.





## Communicating Science Behind Numbers with a Sexy Twist, December 13-15, 2022 – Acacia Hotel

Stepping into the social media space, the project successfully conducted 12 rounds of trivia contests via the DOST-FNRI official Facebook page. Questions were based on the developed media releases and contents of paid quad media placements. The implementation of the planned activities for this project contributed to various significant outcomes which include:



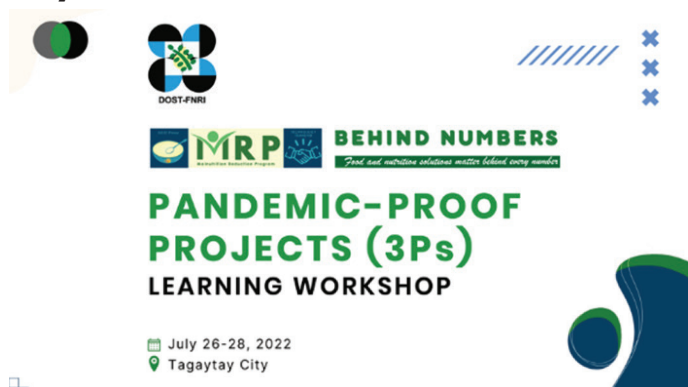
Comments and suggestions of DOST-FNRI media and communication partners and NUTRICOMNET members on the chances of the DOST-FNRI developed media collaterals being published, aired, and posted were solicited during these activities.

Two (2) story conferences and consultations were conducted via Zoom platform. One for partners located in Luzon (February 28, 2022) and one for those located in Visayas and Mindanao (March 30, 2022).

### CAPACITY BUILDINGS

Two (2) seminar-workshops were conducted under this project

### Pandemic-Proof Projects (3Ps) Learning Workshop, July 26-28, 2022 – Tagaytay City





### Media Mileage Generated

The paid quad media placements (29 placements) made in this project generated a total of **Php 25,749,600.00**. This media value contributed 5% to the total media mileage of DOST-FNRI for 2022 (Php 490M).

Television	Php. 18,463,000.00
Radio	Php. 1,193,600.00
Print	Php. 330,000.00
Online News	Php. 1,353,000.00
Live Interviews	Php. 4,700,000.00

Data from Google Trends showed that frequency of Internet search for the terms “FNRI” and “Food and Nutrition Research Institute” spiked from October 2022 onwards, the same months when the paid media placements started.



### Increase in the key metrics of DOST-FNRI Facebook Page

The conduct of trivia contests resulted in increased key metrics performance indicators of DOST-FNRI Facebook page. The cumulative increase in DOST-FNRI key metrics performance indicators were as follows:

Metrics	Jan 2022	Dec 2022	% Increase
Total Number of Likes	71,433	73,769	103%
Average Monthly Reach	855,991	1,617,121	188%
Average Monthly Engagement	55,201	211,983	384%

### Increase in Mean Knowledge Score

Increase in the mean knowledge scores (pre-test vs. post-test) of the participants of the “Communicating Science Behind Numbers with a Sexy Twist” seminar-workshop were noted.

Pre-Test Score (n=60)	Post-Test Score (n=60)
$\bar{x} = 6.4$	$\bar{x} = 8.9$

“Behind Numbers” is the term that captures the rationale behind DOST-FNRI’s communication and promotion activities. DOST-FNRI believes that behind technical data and information is a picture and a story on the current situation of the Filipino population in terms of food and nutrition. And true to its tagline, there are effective solutions that science and technology are offering to address these problems.”

# FN TRAINS- FOOD AND NUTRITION TRAININGS FOR STAKEHOLDERS

Josefina T. Gonzales, Victor Franco J. Alfonso, Jr., Celina Ann J. Navarro,  
Jane Jasmine F. Sune, Jefferson Butch C. Obero



The Food and Nutrition Training Unit (FNTU) of the DOST-FNRI conducts training courses and other learning activities in diffusing the Institute's R&D and S&T systems and procedures to various stakeholders. These are undertaken with the end in view to help improve the capability of the F&N manpower in the country.

In 2022, the FNTU conducted 80 trainings and webinars. The total number of participants for these activities is 2,375 coming from the personnel from the academe, employees of government and private institutions, MSMEs, health professionals (registered nutritionist-dietitians, doctors, medical technologists, among others), LGU personnel, community and barangay health workers, students, mothers and caregivers. The trainings were conducted either face-to-face or online via Zoom platform. Likewise, 28 briefings and orientations on DOST-FNRI programs and services benefited 480 participants from the academe, food industry and government agencies.

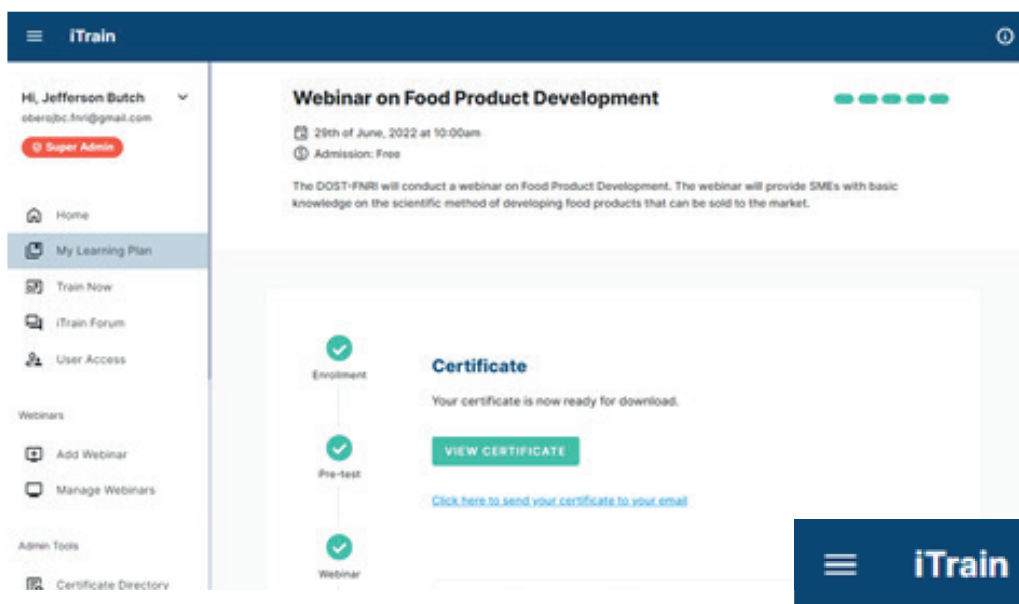
All trainings conducted were applied for Continuing Professional Development (PRC-CPD) units from the Professional Regulations Commission for different professions like nutritionist-dietitian, medical technologist, professional teachers, chemist, midwives, medical doctor, nurses and agriculturists.

The FNTU also implements an OJT Program for local and international undergraduate and graduate student applicants through face-to-face or online modes. For 2022, actual job exposure were provided to 12 local student interns from the Asian Institute of Computer Studies, Polytechnic University of the Philippines (Manila and Taguig City campuses), and Fisher Valley College, and 5 international student interns from the Illinois Wesleyan University, Illinois, USA.

The training team also regularly maintains the iTrain website as the official training platform of DOST-FNRI. The iTrain is designed to cater to more stakeholders







needing food and nutrition training through online mode that lessens logistical requirements, time, and expenses.

In 2022, the iTrain website has served and will continue to serve its various clients by providing relevant and credible nutrition information of DOST-FNRI.

Thus, to better achieve this objective and to further widen the Institute's reach in capacity building, the website has undergone a series of major updates and improvements based on the beta-testing responses submitted by the end-users and system analyses conducted by the technical personnel.

In 2022, a user-centered approach in all manner of design and implementation was adapted to better cater to the thousands of registered users, their needs, and the issues identified.

This led to the development of major updates that include but not limited to: improved overall user interface design, navigation, and content organization; improved website layout and mobile-responsiveness to cater to all device types; improved access restriction rules and user role permissions; and reworked webinar enrollment-to-certificate process.

## Webinar on Food Product Development



29th of June, 2022 at 10:00am

Admission: Free

The DOST-FNRI will conduct a webinar on Food Product Development. The webinar will provide SMEs with basic knowledge on the scientific method of developing food products that can be sold to the market.



## Certificate

Your certificate is now ready for download.

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# OUTCOME 2

**Technology Adoption Promoted  
and Accelerated**



# TRANSFERRED TECHNOLOGY AND SERVICES TO ADOPTORS

## 2022 LICENSING AGREEMENTS



213

Licensing agreements  
signed

Technology	Name/Address of Adoptor or Licensee	Date Signed
Tubig Talino	SG Business Ventures Incorporated	January 25, 2022
Enhanced Nutribun Squash Variant	Surio's Bakery	February 04, 2022
Enhanced Nutribun Squash Variant	JVCare Food Specialty Co.	February 04, 2022
Enhanced Nutribun Squash Variant	Kajchilan Multipurpose Cooperative	February 04, 2022
Enhanced Nutribun Squash Variant	Magicmelt Foods, Inc.	February 04, 2022
Enhanced Nutribun Squash Variant	Santa Lucia Bakeshop	February 04, 2022
Enhanced Nutribun Squash Variant	Herman Bakery	February 04, 2022
Enhanced Nutribun Squash Variant	EJ Bakery	February 04, 2022
Enhanced Nutribun Squash Variant	J.Celon Bakery	February 04, 2022
Enhanced Nutribun Squash Variant	Panahon Bakery	February 04, 2022
Enhanced Nutribun Squash Variant	Villa Margarita Corporation	February 04, 2022
Enhanced Nutribun Squash Variant	Guapito's Bakeshop and Burger Haus	February 04, 2022
Enhanced Nutribun Squash Variant	Doki South Breads Inc. (Mang-Tinapay)	February 04, 2022
Enhanced Nutribun Squash Variant	Binannuaanan Farmers Community Development Association (BFCDA)	February 04, 2022
Enhanced Nutribun Squash Variant	Doki South Breads Inc. (Mang-Tinapay)	February 04, 2022
Enhanced Nutribun Squash Variant	Suguitan Bakery	February 04, 2022
Enhanced Nutribun Squash Variant	Bread Maker	February 04, 2022
Enhanced Nutribun Squash Variant	Johann's General Merchandise	February 04, 2022

Enhanced Nutribun Squash Variant	Villa Margarita Corporation	February 04, 2022
Enhanced Nutribun Squash Variant	SIBBAP (Silangan, Ibabao, Batis, Bulihan, Araneta, Proper) Multipurpose Cooperative	February 04, 2022
Enhanced Nutribun Squash Variant	Sapang Palay National High School Cooperative	February 04, 2022
Enhanced Nutribun Squash Variant	Creative Innovations Food Network, Inc. (Mang-Tinapay)	February 04, 2022
Enhanced Nutribun Squash Variant	Cabaruan Multipurpose Cooperative	February 04, 2022
Enhanced Nutribun Squash Variant	Banana Town Bakery	February 04, 2022
Enhanced Nutribun Squash Variant	Jojie's Bakeshop	February 04, 2022
Enhanced Nutribun Squash Variant	Rejano's Bakery	February 04, 2022
Enhanced Nutribun Squash Variant	Symonn's Bakeshop	February 04, 2022
Enhanced Nutribun Squash Variant	Banana Town Bakery	February 04, 2022
Enhanced Nutribun Squash Variant	Symonn's Bakeshop	February 04, 2022
Enhanced Nutribun Squash Variant	JVCare Food Specialty Co.	February 04, 2022
Enhanced Nutribun Squash Variant	EJ-ED Highlands Flavor	March 09, 2022
Iron Rice Premix	Maramag Community Multi-Purpose Cooperative	March 09, 2022
Iron Fortified Rice	Maramag Community Multi-Purpose Cooperative	March 09, 2022
Rice-Mongo Curls	Provincial Local Government Unit-Lanao del Norte	April 11, 2022
Rice-Mongo Instant Baby Food Blend	Provincial Local Government Unit-Lanao del Norte	April 11, 2022
Brown Rice Bar	Baker's PH	April 11, 2022
Enhanced Nutribun Squash Variant	Apayao State College	April 11, 2022
Enhanced Nutribun Squash Variant	Caraga Adventist Multi-Purpose Cooperative (CAMPCO)	April 11, 2022
Enhanced Nutribun Carrot Variant	Apayao State College	April 11, 2022
Enhanced Nutribun Squash Variant	La Ilustre House of Breads	April 11, 2022
Enhanced Nutribun Squash Variant	3ESMZ Corporation (Lailen's Pastries)	April 11, 2022





Enhanced Nutribun Squash Variant	Kalahiko Bakery	April 11, 2022
Enhanced Nutribun Squash Variant	G'Miguel Bakery	April 11, 2022
Enhanced Nutribun Squash Variant	DMY Bakeshoppe	April 11, 2022
Enhanced Nutribun Squash Variant	Scones and Muffins Bakeshop	April 11, 2022
Enhanced Nutribun Squash Variant	Jeremiah Cakes and Food Services	April 11, 2022
Enhanced Nutribun Carrot Variant	Caraga Adventist Multi-Purpose Cooperative (CAMPCO)	May 05, 2022
Enhanced Nutribun Carrot Variant	Jeremiah Cakes and Food Services	May 05, 2022
Enhanced Nutribun Squash Variant	Mannafest Food Incorporated	May 05, 2022
Enhanced Nutribun Carrot Variant	Mannafest Food Incorporated	May 05, 2022
Rice-Mongo Curls (Renewal)	Nutridense Food Manufacturing Corporation	May 16, 2022
Rice-Mongo Crunchies (Renewal)	Nutridense Food Manufacturing Corporation	May 16, 2022
Rice-Mongo Sesame Blend (Renewal)	Nutridense Food Manufacturing Corporation	May 16, 2022
Multinutrient Growth Mix for Children 6-36 Months (Renewal)	Nutridense Food Manufacturing Corporation	May 16, 2022
Iron-Rice Premix (Renewal)	Nutridense Food Manufacturing Corporation	May 16, 2022
Fortified Rice-Mongo Curls (Renewal)	Nutridense Food Manufacturing Corporation	May 16, 2022
Stabilized Brown Rice (Renewal)	Nutridense Food Manufacturing Corporation	May 16, 2022
Rich Nutty Chocolate Flavored Complementary Food (Momsie) (Renewal)	Nutridense Food Manufacturing Corporation	May 16, 2022
Brown Rice Nutty Fruity Bar (Renewal)	Nutridense Food Manufacturing Corporation	May 16, 2022
Iron-Fortified Rice (Renewal)	Nutridense Food Manufacturing Corporation	May 16, 2022
Fortified Rice-Mongo Blend (Renewal)	Nutridense Food Manufacturing Corporation	May 16, 2022
Rice-Mongo Curls	Nutridense Food Manufacturing Corporation	May 16, 2022
Iron-Fortified Rice	Metro Bugnay Multi-Purpose Cooperative	May 16, 2022

Enhanced Nutribun Carrot Variant	Scones and Muffins Bakeshop	May 16, 2022
Enhanced Nutribun Carrot Variant	La Ilustre House of Breads	May 16, 2022
Enhanced Nutribun Carrot Variant	Kalahiko Bakery	May 16, 2022
Enhanced Nutribun Carrot Variant	G'Miguel Bakery	May 16, 2022
Enhanced Nutribun Carrot Variant	DMY Bakeshoppe	May 16, 2022
Enhanced Nutribun Carrot Variant	JSV Bakeshop	May 16, 2022
Enhanced Nutribun Carrot Variant	Allycel General Merchandise	May 16, 2022
Rice-Mongo Instant Blend	DBB Bakery Incorporated	June 09, 2022
Bottled Tubig Talino (350 ml, 500ml, 1ltr) Exclusive License for 5 years	Wilshan Beverage Manufacturing	June 09, 2022
Enhanced Nutribun Carrot Variant	Pan de Masbate	June 09, 2022
Rice-Mongo Sesame Blend	Actions Hub Philippines Incorporated	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	RGW Catering Services Inc., a.k.a. Richgold Weddings	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Solid Brass Bakeshop	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	JBM Food Products	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Marylois Food Products	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	C.T. Cosmos Bakery and Grocery	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	J.A. Fruits and Vegetables Processing	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Cup and Saucer Bakery	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Planas Bakeshop and Store	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Mayfair Bakeshop	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Louis Roy Bakeshop	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	DBB Bakery Incorporated	June 09, 2022





Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Nutridense Food Manufacturing Corporation	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	EnMiri Corporation	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Kilpatrick's Corporation	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Carry's Bakeshop	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Sapang Palay National High School - MPC	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	TJN Pasalubong Foods Incorporated	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Creative Innovations Food Network Incorporated (Mang Tinapay)	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	JCG Marketing Group Incorporated	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	PNR Bakery and General Merchandise	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	BD Breads and Buns Bakery	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Five Brother's Bakery	June 09, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Queen Lois Catering Services	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	San Isidro Multi-Purpose Cooperative	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Swisspharma Research Laboratories Incorporated	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	A.S.S. Ramos Bakery	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Golden Wheat Bakery	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Panaderia Pantoja Incorporated	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Sabuhin Bakery	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Pecto's Bakery	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	LGU-Mauban, Quezon Province	June 15, 2022

Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Allycel General Merchandise	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Tadian Marie June Bakeshop	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	EJ-ED Highlands Flavor	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Mt. Zion Bakery	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Northland Foods Incorporated	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	VFM Food Products	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	E.V. Cuevas Bakeshop	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	P. Lunar's Bakery	June 15, 2022
Iron-Fortified Rice	JC Laroco Ricemill	June 15, 2022
Iron-Fortified Rice	Palawan ARC Cooperative Federation (PARCOFED)	June 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	SG Business Ventures Inc.	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	RGM326 Corporation (Gem See's Cakeshop)	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Balayong Summit Inc. - Balayong Bakery	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Amira's Buco Tart Haus	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	SIBBAP Multipurpose Cooperative	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Johann's General Merchandise	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	DMY Bakeshoppe	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	G'Miguel Bakery	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Kalahiko Bakery	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	D'Hermanos Pizza	July 01, 2022





Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Scones and Muffins Bakeshop	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	JVcare Food Specialty Co.	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	La Elena Pension House Rental	July 01, 2022
Rice-Mongo Crunchies	Filbake Food Corporation	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Baron Bakeshop	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Z Bros Food Products	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Paige's Bakery Products Shop	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Susan's Bakeshop	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Piazza Zicarelli Hotel, Restaurant and Bakeshop	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Breadcart Bakeshop and Coffeeshop	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Navales Foods	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Ma-an's Bakeshop, Co.	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Han's Cake and Pastries	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	John Ruiz Bakeshop	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Carry's Bakeshop	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Guapito's Bakeshop and Burger Haus	July 01, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	M'Lang Breadmaster Bakeshoppe	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Pick and Go Convenience Store	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Bestfriend Goodies	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	D'Paragon AA Corp	July 15, 2022

Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Patrick's Cakehouse & Catering	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Bread Master	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Waffle Time, Inc.	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Great Foods Concepts, Inc.	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Julia Bakeshop	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Zambo Leading Foods, Inc. – Mang Tinapay	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Rodriguez Burger and Bread Corporation Mayong's Bakeshop & Snackhouse	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Seamall Petron Service Station Bakeshop (Kambal Pandesal)	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Villa Margarita Corporation (Villa Margarita Catering Services)	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Señor San Jose Franchising Corporation	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	St. Eves Bakeshop	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Magicmelt Foods, Inc.	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	San Jose Workers Multi-Purpose Cooperative	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	AJJJ Bakeshop	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	CM & Sons Food Products, Inc.	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Filbake Food Corporation	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Esteems Industries Inc.	July 15, 2022
Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Saint's Baked Delights	July 15, 2022





Enhanced Nutribun Sweet Potato Variants (Yellow, Orange, and Purple)	Palawan Adventist Health Products, Inc.	July 15, 2022
Iron Rice Premix	Aretei Foods Corporation	August 16, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	Rejano's Bakery	August 16, 2022
Iron-Fortified Rice	Esteems Industries Inc.	August 16, 2022
Iron-fortified Rice	FRT Rice Mill	August 16, 2022
Iron-fortified Rice	Aretei Foods Corporation	August 16, 2022
Rice-Mongo Instant Blend	Actions Hub Philippines Inc.	August 16, 2022
Rice-Mongo-Sesame Blend	Al-Rahman Farmers Multi-Purpose Cooperative	August 16, 2022
Enhanced Nutribun Squash Variant	HDRD TSUITERU FOOD BAR	September 22, 2022
Enhanced Nutribun Squash Variant	Chef Connie's Cafe & Resto & Catering Services	September 22, 2023
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	Sweetie Pies Pasalubong Center	September 22, 2024
Enhanced Nutribun Squash Variant	Sir Ezer Bakery	September 22, 2022
Rice-Mongo Curls	Great Foods Concepts, Inc.	September 22, 2022
Enhanced Nutribun Squash Variant	Maestra Bakeshop	October 07, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	Herman Bakery	November 04, 2022
Enhanced Nutribun Squash Variant	Nueva Ecija Federation of Dairy Carabao Cooperative (NEFEDCO)	November 04, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	Maestra Bakeshop	November 04, 2022
Enhanced Nutribun Squash Variant	Maestra Bakeshop	November 04, 2022
Complementary Foods	LGU-Ozamiz, Misamis Occidental	November 04, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	Jojie's Bakeshop	November 04, 2022

Rice-Mongo Instant Blend	Asyana Multichem Corporation	November 04, 2022
Enhanced Nutribun Squash Variant	Inang Enyang's Eleven Fourteen Sweet Candies	November 04, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	Charitrixie Bakery	November 04, 2022
Enhanced Nutribun Squash Variant	Suguitan Bakery	November 04, 2022
Enhanced Nutribun Squash Variant	Glend's Bakeshop and Catering Services	November 04, 2022
Enhanced Nutribun Squash Variant	Chocovron Global Corp	November 04, 2022
Enhanced Nutribun Squash Variant	Mahintana Foundation Inc.	November 04, 2022
Enhanced Nutribun Squash Variant	Symon Tash Bakeshop & Catering Services	November 04, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	AICEE Catering Food Services	November 04, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	EJ Bakery	November 04, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	Sir Ezer Bakery	November 04, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	Miguel, Rafael, Gabriel Food Products	November 04, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	Department of Education Division of Sagay City	November 04, 2022
Enhanced Nutribun Squash Variant	Mayo Yummy Foods Corporation	November 04, 2022
Micronutrient Growth Mix (MGM) 14	Asyana Multichem Corporation	November 04, 2022
Enhanced Nutribun Squash Variant	Manfour Packaging Solutions, Inc.	November 04, 2022
Enhanced Nutribun Squash Variant	Gwen's Bakeshop	November 04, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	J. Celon Bakery	November 04, 2022
Enhanced Nutribun Squash Variant	Benitta and Flora's Bakery	November 04, 2022
Enhanced Nutribun Squash Variant	Pamela's Bakeshoppe	November 04, 2022





Enhanced Nutribun Squash Variant	Muggle's Mango Snack House	November 04, 2022
Enhanced Nutribun Squash Variant	Checacio General Merchandise and Pharmacy	November 04, 2022
Enhanced Nutribun Squash Variant	ECB Enterprises	November 04, 2022
Enhanced Nutribun Squash Variant	LGU-General Nakar	November 04, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	Provincial Government of Quirino, Quirino Livelihood for Everyone (Q-Life)	November 04, 2022
Enhanced Nutribun Squash Variant	Constacio's Bakery Product Shop	November 04, 2022
Rice-Mongo Curls	Nutrition and Beyond Corporation (NBC)	November 21, 2022
Enhanced Nutribun Sweetpotato Variants (Yellow, Orange, and Purple)	Ysabel Convenience Store	November 21, 2022
Enhanced Nutribun Squash Variant	Nutrition and Beyond Corporation (NBC)	November 21, 2022
Rice-Mongo Instant Blend	Nutrition and Beyond Corporation (NBC)	November 21, 2022



# SITE VISITS/MONITORING AND EVALUATION/TECH- NOLOGY NEEDS ASSESSMENTS



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Site Visits/  
Technology Needs Assessment

## 2022 SITE VISITS CONDUCTED/ TECHNOLOGY NEEDS ASSESSMENT

Technology	Name/Address of Adoptor or Licensee	Date Signed
Complementary Foods	WAFFLETIME INC., Iloilo City	January 19, 2022
IFR Blending Machine	HDN Technology and Resources, 5th St., Golden Mile Business Park, Maduya, Carmona, Cavite	February 3, 2022
Enhanced Nutribun	JEREMIAH CAKES AND FOOD SERVICES, Cebu Avenue, Bonifacio- Bataan Streets, Brgy. Aplaya, Digos City, Davao del Sur	February 18, 2022
Enhanced Nutribun	EMILIA'S BAKESHOP, Dagupan, Tabuk City, Kalinga	February 18, 2022
Enhanced Nutribun	NUEVA ECIJA FEDERATION OF DAIRY CARABAO COOPERATIVE, San Ricardo, Talavera, Nueva Ecija	February 18, 2022
Enhanced Nutribun	RANCE & ANYAS BAKERY, Centro 1, Orani, Bataan/Ms. Marissa Pentason	February 18, 2022
Enhanced Nutribun	DMY BAKESHOPPE, Mangilag Sur, Maharlika Highway, Candelaria, Quezon	February 18, 2022
Enhanced Nutribun	G'MIGUEL BAKERY, Brgy. Concepcion 1, Sariaya, Quezon	February 18, 2022
Enhanced Nutribun	SCONES AND MUFFINS BAKESHOP, Brgy. Cotta, Lucena City, Quezon	February 18, 2022
Enhanced Nutribun	KALAHIKO BAKERY, No. 179 PUHA St. Brgy. Lusacan, Tiaong, Quezon	February 18, 2022
Enhanced Nutribun	LA ILUSTRE HOUSE OF BREAD, #30 Naval St., Brgy. Flores, Malabon City	February 18, 2022
Enhanced Nutribun	MUGGLE'S MANGO SNACK HOUSE, Tarusan St. San Francisco, Iriga City	February 18, 2022
Enhanced Nutribun	HELEN'S CANDY AND PASTRIES, El Salvador, City Misamis Oriental	February 18, 2022





Enhanced Nutribun	MANNAFEST FOOD INC., Jade St. Santiago Village, Divisoria, Zamboanga City	February 18, 2022
Enhanced Nutribun	ZAMBOANGA BAKERY AND GROCERY, Mayor Jaldon Street, Zamboanga City	February 18, 2022
Enhanced Nutribun	CARAGA ADVENTIST MULTI- PURPOSE COOPERATIVE (CAMPCO), P-24 Brgy. Poblacion, Bayugan City, Agusan del Sur	February 18, 2022
Enhanced Nutribun	MAESTRA PANADERIA, 107 Paliparan 1, Dasmariñas City, Cavite	February 18, 2022
Enhanced Nutribun	SIR EZER BAKERY, 317 J. Rizal Street, Barangay Tubuan Uno, Silang, Cavite	February 18, 2022
Enhanced Nutribun	LGU Panglima Sugala, Tawi-Tawi	February 28 to March 4, 2022
Enhanced Nutribun	LGU Tungawan, Zamboanga Sibugay	February 28 to March 4, 2022
Enhanced Nutribun	BAKE-A-LICIOUS BAKERY SUPPLIES TRADING, AFPOVAI 230 Lot 3 B33 Diego Silang St., Western Bicutan, Taguig City	March 2, 2022
Enhanced Nutribun	GMC BAKERY, Barangay Poblacion, Pinamalayan, Oriental Mindoro	March 2, 2022
Enhanced Nutribun	BREAD'S EDGE CORPORATION, CPG Ave., Cor. H. Grupo St., Pob II, Tagbilaran City	March 2, 2022
Enhanced Nutribun	3ESMZ CORPORATION (LAILEN'S PASTRIES), Escaler Street, Aurea Subdivision, Sta. Lucia City of San Fernando, Pampanga	March 2, 2022
Enhanced Nutribun	DFP HOUSE OF CHICKEN & BY- PRODUCTS/D.E.M.M.E.GROCERS, 1 Filipinas Avenue, Dulumbayan, Teresa, Rizal	March 2, 2022
Enhanced Nutribun	TJL'S BAKESHOP, Baybay Dagat, San Fernando, Masbate	March 2, 2022
Complementary Foods	BNSA Odiongan, Romblon	March 28 to April 1, 2022
Complementary Foods	LGU Palo, Leyte	April 8, 2022

Complementary Foods	Sultan Kudarat State University	April 20, 2022
Complementary Foods	LGU Kidapawan	April 21, 2022
Tubig Talino	Samahan ng Mandaragat ng Banilad (SAMBA), Oriental Brgy. Banilad, Pinamalayan, Oriental Mindoro	May 18, 2022
Tubig Talino	BILIBINWANG MULTIPURPOSE COOPERATIVE, Brgy. Bilibinwang, Agoncillo, Batangas	June 10, 2022
Enhanced Nutribun	HDRD Tsuiteru Food Bar, Sampaloc, Manila	June 23, 2022
Enhanced Nutribun	REGINO'S BAKESHOP, Poblacion East, Bautista, Pangasinan	June 23, 2022
Enhanced Nutribun	NUTRITION AND BEYOND CORPORATION (NBC), Km. 99, Maharlika Highway, Diversion Road, Tambo, San Leonardo, Nueva Ecija	June 23, 2022
Enhanced Nutribun	T.A. Central Metro Foods Inc., Tomas Cabiles, San Juan, Tabaco City	June 23, 2022
Enhanced Nutribun	MUGGLE'S MANGO SNACK HOUSE, Tarusan St., San Francisco, Iriga City	June 23, 2022
Enhanced Nutribun	CHEF CONNIE'S RESTO & CAFE & CATERING SERVICES, G/F Costa Verde Development Corporation (CVDC), Zone 3, Rizal St., Cabangan, Legazpi City	June 23, 2022
Enhanced Nutribun	KALAHY BAKERY, 30T. Azucena St. Barangay IV-B, San Pablo City, Laguna	June 23, 2022
Enhanced Nutribun	BUENAFACIA CORPORATION (NEW EVERLASTING BAKERY), #8 Regidor St., San Pablo City, Laguna	June 23, 2022
Enhanced Nutribun	SWITSIS FOOD PRODUCTS, 314 Purok 8, Barangay Tuy, Rizal, Laguna	June 23, 2022
Enhanced Nutribun	HEALTH FOODS - ADVENTIST UNIVERSITY OF THE PHILIPPINES, Silang, Cavite	June 23, 2022





Enhanced Nutribun	CALZADO GENERAL MERCHANDISE, 3.5 Sitio Dilain, Cainta, Rizal	June 23, 2022
Enhanced Nutribun	MAESTRA PANADERIA, 107 Paliparan 1, Dasmariñas City, Cavite	June 23, 2022
Enhanced Nutribun	SIR EZER BAKERY, 317 J. Rizal Street Barangay Tubuan Uno, Silang, Cavite	June 23, 2022
Enhanced Nutribun	FOOD BASKETS CORPORATION, Antipolo City, Rizal	June 23, 2022
Enhanced Nutribun	CITY LIVELIHOOD AND DEVELOPMENT OFFICE, Bacoor City, Cavite	June 23, 2022
Enhanced Nutribun	RANDY BAKESHOP, Brgy. Lalawigan, Borongan City, Eastern Samar	June 23, 2022
Enhanced Nutribun	TRI-DEN INC., San Nicolas St., Barangay Poblacion, Mariveles, Bataan	June 23, 2022
Enhanced Nutribun	Anne Rachel Bakery and Cafe, St. Joseph Subd., Barangay Bayan, Orani, Bataan	June 23, 2022
Enhanced Nutribun	ENMIRI CORPORATION, 170 Purok 1 San Isidro, Cabanatuan City, Nueva Ecija	June 23, 2022
Enhanced Nutribun	MARIO'S PANDESAL, San Fernando City, Pampanga	June 23, 2022
Enhanced Nutribun	MANFOUR PACKAGING SOLUTIONS, INC., Pandayan, City of Meycauayan, Bulacan	June 23, 2022
Enhanced Nutribun	INANG ENYANG'S ELEVEN FOURTEEN SWEET CANDIES, 1065 Daan Bakal San Juan, San Miguel, Bulacan	June 23, 2022
Enhanced Nutribun	EMILIA'S BAKESHOP, Dagupan, Tabuk City, Kalinga	June 23, 2022
Enhanced Nutribun	RANCE AND ANYA'S BAKERY, Centro 1, Orani, Bataan	June 23, 2022
Complementary Food	Cagayan State University	July 21, 2022
Iron Fortified Rice	Saavedra	July 30, 2022

Enhanced Nutribun	CONSTANCIO'S BAKERY PRODUCT SHOP, #6 St. Andrew Avenue Lopez Village San Isidro, Paranaque City	September 1, 2022
Enhanced Nutribun	PHILIPPINE NUTRI-FOODS CORPORATION, Alabang, Muntinlupa City and Lipa City, Batangas	September 1, 2022
Enhanced Nutribun	BRED VELVET BAKESHOP, 21 Velvet St., Bonita Homes Subd. Concepción Dos, Marikina City	September 1, 2022
Enhanced Nutribun	GWEN'S BAKESHOP, 3536 St. Joseph Street, Rocka Village, Tabang, Plaridel, Bulacan	September 1, 2022
Enhanced Nutribun	ECB ENTERPRISES, 179 Cutcot, Pulilan, Bulacan	September 1, 2022
Enhanced Nutribun	EASTERN PRIMARY MULTI-PURPOSE COOPERATIVE, #426 Paseo Rueda St. Brgy. Sibut, San Jose City, Nueva Ecija	September 1, 2022
Enhanced Nutribun	SYMONTASH BAKESHOP, Zone 6, Upper, Carolina, Naga City, Camarines Sur	September 1, 2022
Enhanced Nutribun	BENITTA AND FLORA'S BAKERY, Bulalacao St., San Buenaventura, Buhi, Camarines Sur	September 1, 2022
Enhanced Nutribun	PHILIPPINE CHI MEI FROZEN FOOD INC. (PCMFFI), Panorama Bldg. 2, CNB St., LIIP-SEZ, Mamlasan, Biñan City, Laguna	September 1, 2022
Enhanced Nutribun	LGU-BIÑAN (The City Government of Biñan's Gender and Development Office), Biñan City, Laguna	September 1, 2022
Enhanced Nutribun	CHOCOVRON GLOBAL CORP., Lot 42A Magsaysay Rd., Brgy. San Antonio, San Pedro, Laguna	September 1, 2022
Enhanced Nutribun	MAYO YUMMY FOODS CORPORATION, #94 Barangay Milagrosa, Calamba City	September 1, 2022
Enhanced Nutribun	REMO VARIETY STORE AND BAKERY, Purok 6, Zone 2, Mahabang Parang, Agono, Rizal	September 1, 2022





Enhanced Nutribun	LGU-GENERAL NAKAR, Barangay Anoling, General Nakar, Quezon	September 1, 2022
Enhanced Nutribun	CITY LIVELIHOOD AND DEVELOPMENT OFFICE, Bacoor City, Cavite	September 1, 2022
Enhanced Nutribun	MANFOUR PACKAGING SOLUTIONS INC., Pandayan, City of Meycauayan, Bulacan	September 1, 2022
Enhanced Nutribun	INANG ENYANG'S ELEVEN FOURTEEN SWEET CANDIES, 1065 Daan Bakal, San Juan, San Miguel, Bulacan	September 1, 2022
Enhanced Nutribun	MAHINTANA FOUNDATION INC., Cannery Housing, Cannery Site, Polomolok, South Cotabato	September 1, 2022
Enhanced Nutribun	GLEND'S BAKESHOP AND CATERING SERVICES, 654 Acacia St., Poblacion, Makilala, Cotabato	September 1, 2022
Enhanced Nutribun	PAMELA'S BAKESHOPPE, New Cebu, President Roxas, North Cotabato	September 1, 2022
Enhanced Nutribun	GMC BAKERY, Barangay Poblacion, Pinamalayan, Oriental Mindoro	September 1, 2022
Enhanced Nutribun	CANTOS BAKERY, Sitio Calawag, Barangay Lumangbayan, Calapan City, Mindoro	September 1, 2022
Enhanced Nutribun	OLYMPIA'S BAKERY, Highway 3, Barangay Bayanan I, Calapan City, Oriental Mindoro	September 1, 2022
Enhanced Nutribun	QUINTO'S BREAD HOUSE, Aurora Blvd, Barangay San Vicente West, Calapan City, Oriental Mindoro	September 1, 2022
Enhanced Nutribun	CITY COLLEGE OF CALAPAN, Barangay Guinobatan, Calapan City, Oriental Mindoro	September 1, 2022
Squash Supplemented Products	YUM BREAD HAUZ, Cagayan de Oro	September 2, 2022
Tubig Talino	LANE'S WATER REFILLING STATION, Barangay Nanhaya, Victoria, Laguna	September 15, 2022
Brown Rice Nutty Fruity Bar	GREAT FOODS CONCEPT, Iloilo City	September 15, 2022

MGM and Rice-Mongo Instant Blend	ASYANA MULTICHEM, No.32 Dagohoy St., Samson Road, Caloocan City	September 20, 2022
Rice-Mongo Instant Blend and Rice-Mongo Curls	NUTRITION AND BEYOND CORPORATION, 99, Maharlika Highway, San Leonardo, Nueva Ecija	September 20, 2022
Enhanced Nutribun	ECB ENTERPRISES, 179 Cutcot, Pulilan Bulacan, (Proposed Facility for Enhanced Nutribun Production)	October 12, 2022
Enhanced Nutribun	GWENDALYN'S BAKESHOP'S, Tabang, Parulan, Plaridel, Bulacan	October 12, 2022
Tubig Talino	AQUA DABAW WATER REFILLING STATION, Saturn St., YCF Fatima Village, Barangay San Antonio, Agdao District, Davao City	November 9, 2022
Tubig Talino	ZYN WATER REFILLING STATION, Purok #3, Brgy. Timmaguab, Sta. Ignacia, Tarlac	November 9, 2022
Tubig Talino	SG BUSINESS VENTURE, Lane 101, Masterson's Avenue, Upper Carmen, Cagayan de Oro City, Misamis Oriental	November 9, 2022
Complementary Foods	RIO TUBA NICKEL MINING CORPORATION, Bataraza, Palawan,	November 18, 2022
Enhanced Nutribun	JAININ'S CAKES AND PASTRIES, Candanay Norte, Siquijor	December 1, 2022
Enhanced Nutribun	Larena Triad Restaurant, Bakeshop & Catering Services, South Poblacion, Larena, Siquijor	December 2, 2022
Pancit Canton with Squash	Queen Lois Catering Services, National Highway, Brgy. Dayap, Calauan, Laguna	December 7, 2022
Enhanced Nutribun	United Tingguians Multipurpose Cooperative, Pikek, Daguioman, Abra	December 22, 2022





## MONITORING AND EVALUATION OF LICENSEES CONDUCTED



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**Licensees monitored  
and evaluated**

Technology	Name of Company	Date
Enhanced Nutribun	Ajjj Bakeshop	March 4, 2022
Enhanced Nutribun	Cm & Sons Food Products, Inc.	March 4, 2022
Enhanced Nutribun	Pecto's Bakery	March 4, 2022
Enhanced Nutribun	La Elena Pension House Rental	March 4, 2022
Enhanced Nutribun	Susan's Bakeshop	March 4, 2022
Enhanced Nutribun	Ma-An's Bakeshop, Co.	March 4, 2022
Enhanced Nutribun	P. Lunar's Bakery	March 4, 2022
Enhanced Nutribun	Pnr Bakery and General Merchandise	March 4, 2022
Iron Fortified Rice	Orlico Food Corporation	March 4, 2022
Enhanced Nutribun	Shape's Bakeshop	March 28 to April 1, 2022
Complementary Foods (Rice-Mongo Curls and Rice-Mongo Instant Blend)	Office of the Provincial Agriculturist of Pagbilao Quezon Province	March 1, 2022
Stabilized Brown Rice	Leads International Corporation	April 04, 2022
Enhanced Nutribun	PNR Bakery and General Merchandise	May 19, 2022
Enhanced Nutribun	Loubelle Bakery	May 19, 2022
Enhanced Nutribun	TJN Pasalubong	May 19, 2022
Enhanced Nutribun	JSV Bakeshop	June 2, 2022
Complementary Foods (Rice-Mongo-Sesame Blend)	BNSA Odiongan, Romblon	June 20, 2022
Complementary Foods (Rice-Mongo Curls and Rice-Mongo-Sesame Blend)	LGU-Baybay, Leyte	June 24, 2022

Enhanced Nutribun	Ed Cuevas Bakery	June 29, 2022
Enhanced Nutribun	E.V. Cuevas Bakeshop	June 29, 2022
Enhanced Nutribun	Bag of Sweet Bite Bakehouse	June 29, 2022
Enhanced Nutribun	Sapang Palay National High School MPC	June 29, 2022
Brown Rice Bar	Nutridense Food Manufacturing Corp.	June 28, 2022
Enhanced Nutribun	Chef Huts Bakery Corp.	July 31, 2022
Enhanced Nutribun	Royal Buns Corporation	July 31, 2022
Enhanced Nutribun	D' Paragon AA Corp.	July 31, 2022
Enhanced Nutribun	Villa Margarita Corporation	July 31, 2022
Enhanced Nutribun	AAVFOODS Inc.	August 17, 2022
Enhanced Nutribun	Binannuaanan Farmers Community Development Association (BFCDA)	August 17, 2022
Enhanced Nutribun	Chef Connie's Cafe & Resto & Catering Services	August 18, 2022
Enhanced Nutribun	Waffletime Inc.	September 6, 2022
Complementary Foods	LGU Capiz	September 7, 2022
Complementary Foods	LGU Cabaatuan	September 7, 2022
Complementary Foods	University of Antique	September 8, 2022
Enhanced Nutribun	Bread Basket Bread & Pastry Shop	September 8, 2022
Enhanced Nutribun	Filbake Food Corporation	September 9, 2022
Canned Laing and Canned Pochero	Century Canning Corporation	September 12, 2022
Tubig Talino	Wilshan's Beverage and Manufacturing	September 20, 2022
Rice Blending Machine	HDN Technology and Resources Inc.	September 20, 2022
Pinggang Pinoy Food Plate	FNRI Employees Association Inc.	September 20, 2022
Complementary Foods (Rice-Mongo Curls and Rice-Mongo Instant Blend)	Sultan Kudarat State University	September, 2022
Enhanced Nutribun	Jojie's Bakeshop	September 19, 2022
Enhanced Nutribun	San Jose Workers MPC	September 22, 2022





Enhanced Nutribun	Caraga Adventist Multi-Purpose Cooperative (CAMPCO)	September 27, 2022
Enhanced Nutribun	Amaris Merav Corporation	September 29, 2022
Complementary Foods (Rice-Mongo Crunchies and Rice-Mongo-Sesame Blend)	E. Zobel Foundation, Inc.,	October 19, 2022
Enhanced Nutribun	San Jose Workers Multipurpose Cooperative	October 19, 2022
Enhanced Nutribun	Panaderia Pantoja, Inc.	October 19, 2022
Complementary Foods	PLGU Zamboanga del Norte	October 5-7, 2022
Complementary Foods (Rice-Mongo Crunchies and Rice-Mongo Instant Blend)	LGU-Guiguinto	November 14, 2022
Complementary Foods (Rice-Mongo Curls and Rice-Mongo Instant Blend)	LGU - Bayawan City	November 8, 2022
Complementary Foods (Rice-Mongo Curls and Rice-Mongo Instant Blend)	Quezon Food & Herbal Processing Center PLGU-Quezon	November 8, 2022
Complementary Foods (Rice-Mongo Curls and Rice-Mongo Instant Blend)	LGU-San Jose	November 9, 2022
Complementary Foods (Rice-Mongo Curls and Rice-Mongo Instant Blend)	Social Action Commission, Boac, Marinduque	November 14, 2022
Complementary Foods (Rice-Mongo-Sesame Blend)	LGU-Capiz	November 14, 2022
Complementary Foods (Rice-Mongo Instant Blend)	Negrense Volunteers for Change, Foundation Inc.	November 14, 2022
Complementary Foods (Rice-Mongo Curls and Rice-Mongo Instant Blend)	Davao del Norte State College	November 14, 2022
Complementary Foods (Rice-Mongo-Sesame Blend)	LGU-Ozamiz	November 24, 2022
Enhanced Nutribun	St. Ives Bakeshop	November 19, 2022
Enhanced Nutribun	LTS City Foods, Inc.,	November 19, 2022
Complementary Foods, Iron Fortified Rice, Brown Rice Bar, Momsie, MGM, etc.	Nutridense Food Manufacturing Corporation	December 5, 2022
Enhanced Nutribun	Solid Brass Trading	December 5, 2022

# TRADEMARKS, PATENTS/UTILITY MODELS AND COPYRIGHTS



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**Filed patents/utility models, copyrights, and trademarks**



81

**Approved patents/utility models, copyrights, and trademarks**

## FILED UTILITY MODELS

Date Filed	Title	Registry No.	Type	Name of Researcher/Inventor/Agency
2022-Feb-12	Fortified Protein Food Bar	2-2022-050075	Utility Model	Marcela C. Saises; Abbie L. Padrones; Theresa Krista B. Jolejole; Aiza B. Umali; John Lester G. Ramirez; Remina S. Sabado; Junimer B. Lala
2022-Feb-12	Process of Producing Fortified Protein Food Bar	2-2022-050074	Utility Model	Marcela C. Saises; Abbie L. Padrones; Theresa Krista B. Jolejole; Aiza B. Umali; John Lester G. Ramirez; Remina S. Sabado; Junimer B. Lala
2022-Mar-25	Process of Producing Low-Protein Reconstituted Rice and Products Thereof	2-2018-050129	Utility Model	Marcela C. Saises; Trinidad II T. Arcangel; Cecilia Quindara; Jeannelyn Sevilla; Dona Rose Layusa; John Lester Ramirez; Sandro Flores; Junimer B. Lala
2022-Dec-09	Process of Producing Fortified Protein Cookie	2-2022-051174	Utility Model	Marcela C. Saises; Abbie L. Padrones; Theresa Krista B. Jolejole; Aiza B. Umali; John Lester G. Ramirez; Remina S. Sabado; Junimer B. Lala
2022-Dec-09	Fortified Protein Cookie	2-2022-051175	Utility Model	Marcela C. Saises; Abbie L. Padrones; Theresa Krista B. Jolejole; Aiza B. Umali; John Lester G. Ramirez; Remina S. Sabado; Junimer B. Lala





## FILED COPYRIGHTS

Date Filed	Title	Registry No.	Type	Name of Researcher/ Inventor/Agency
2022-Mar-25	2022 Menu Guide Calendar “Nutritious Meals for Healthier Families in the New Normal”	O2022-315	Copyright	May Ann D. Gironella; Idelia G. Glorioso; Eirene Agustin B. Arnejo; Veronica Vianca C. Salazar; Shannen Faye Q. Arevalo; Erika Niña C. Bacolod; Mark Gerald J. Ba-Ay; Christelle Lois T. Bayalas; Ma. Corazon E. Palompo; Eva L. Rebato; Marietta M. Bumanglag; Milflor S. Gonzales, Ph.D.
2022-Mar-25	Food Exchange Lists for Meal Planning (4th Edition) User’s Guide Audio Visual Presentation	O2022-319	Copyright	Noelle Lyn C. Santos; Robby Carlo A. Tan; David Kenneth C. Mendoza; Marilou M. Lopez-Madrid; Edward Vincent J. Magtibay
2022-Mar-25	Food Exchange Lists for Meal Planning (4th Edition) User’s Guide Overview Audio Visual Presentation	O2022-318	Copyright	Noelle Lyn C. Santos; Robby Carlo A. Tan; David Kenneth C. Mendoza; Marilou M. Lopez-Madrid; Edward Vincent J. Magtibay
2022-Mar-25	Food Exchange Lists for Meal Planning (4th Edition) Visual Guide	O2022-320	Copyright	Noelle Lyn C. Santos; Robby Carlo A. Tan; David Kenneth C. Mendoza; Marilou M. Lopez-Madrid; Edward Vincent J. Magtibay
2022-Mar-25	Manual of Operations: Assessment of Body Composition Using Deuterium Dilution Technique: Infants and Young Children	O2022-316	Copyright	Carl Vincent D. Cabanilla; Amster Fei P. Baquiran; Justin T. Magdangal; Patrick A. Reyes; Roselle C. Sapanghila; Neil M. Tungol

2022-Mar-25	Manual of Operations: Assessment of Body Composition and Total Energy Expenditure Using Doubly Labeled Water Method: Infants and Young Children	O2022-317	Copyright	Carl Vincent D. Cabanilla; Amster Fei P. Baquiran; Justin T. Magdangal; Patrick A. Reyes; Roselle C. Sapanghila; Neil M. Tungol
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2022-May-5	2019 Expanded National Nutrition Survey Monograph Series: The Food Health and Nutrition Situation of Zamboanga Sibugay	O2022-631	Copyright	Charina A. Javier; Glen Melvin P. Gironella; Charmaine A. Duante; Mario V. Capanzana, Ph.D.; Imelda Angeles-Agdeppa, Ph.D.
2022-May-5	DOST PINOY (Package for the Improvement of Nutrition Of Young Children) IMPLEMENTOR'S HANDBOOK: Talaan ng mga katanungan para sa Implementasyon ng Malnutrition Reduction Program	O2022-611	Copyright	Josefina T. Gonzales; Jane Jasmine F. Sune; Kelia Colleen C. Diaz; Celina Ann J. Navarro; Filipiniana B. Bragas; Czarina Teresita S. Martinez; Julieta B. Dorado; Emily O. Rongavilla; Joanne Jette S. Gulay; Rowena V. Viajar; Marie T. Bugas, Ph.D.; Georgina S. Caraig; Nesrianne G. Buyco
2022-Aug-19	Philippine Food Composition Tables (PhilFCT) Mobile Application	O2022-1710	Copyright	Kristine B. Nacionales; Regina G. Rodriguez; Alexandra Lyne E. David; Ma. Ariza C. Baylosis; Aries G. Lundag





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2022-Aug-19	Philippine Nutrition Facts and Figures: 2018-2019 Expanded National Nutrition Survey (ENNS)	A2022-2030	Copyright	Charmaine A. Duante; Chona F. Patalen; Eva A. Goyena, Ph.D.; Cristina G. Malabad; Charina A. Javier; Glenda P. Azaña; Glen Melvin P. Gironella; Eldridge B. Ferrer; Ma. Lynell V. Maniego; Ma. Lilibeth P. Dasco; Imelda Angeles-Agdeppa, Ph.D.; Mario V. Capanzana, Ph.D.
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2022-Aug-19	Philippine Nutrition Facts and Figures: 2018-2019 Expanded National Nutrition Survey (ENNS): Food Consumption Survey	A2022-2031	Copyright	Ma. Lilibeth P. Dasco; Eva A. Goyena, Ph.D.; Josie P. Desnacido; Maylene P. Cajucom; Ma. Evette B. Misagal; Apple Joy D. Ducay; Imelda Angeles-Agdeppa, Ph.D.; Mario V. Capanzana, Ph.D.
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2022-Aug-19	MyGeneMyDiet® Nutrition Module 1: Eat Right, Fit Right (Version 1)	A2022-2026	Copyright	Jacus S. Nacis; Diana Glades A. Domalanta-Ronquillo; Jason Paolo H. Labrador; Aurora Maria Francesca D. Dablo; Julianne Janine V. Carrillo; Marilou M. Lopez-Madrid; Ruby D. Frane; Noelle Lyn C. Santos; Debbie Ann S. Martinez; Dianne Jane V. Fanio; Mikko Glen Fernandez; Marietta P. Rodriguez
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2022-Dec-23	Process of Producing Fortified Protein Cracker	2-2022-051172	Utility Model	Marcela C. Saises; Abbie L. Padrones; Theresa Krista B. Jolejole; Aiza B. Umali; John Lester G. Ramirez; Remina S. Sabado; Junimer B. Lala
2022-Dec-23	Fortified Protein Cracker	2-2022-051173	Utility Model	Marcela C. Saises; Abbie L. Padrones; Theresa Krista B. Jolejole; Aiza B. Umali; John Lester G. Ramirez; Remina S. Sabado; Junimer B. Lala



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2022-Aug-26	MyGeneMyDiet® Nutrition Module 1: Eat Right, Fit Right (Version 1)	A2022-2026	Copyright	Jacus S. Nacis; Diana Glades A. Domalanta-Ronquillo; Jason Paolo H. Labrador; Aurora Maria Francesca D. Dablo; Julianne Janine V. Carrillo; Marilou M. Lopez-Madrid; Ruby D. Frane; Noelle Lyn C. Santos; Debbie Ann S. Martinez; Dianne Jane V. Fanio; Mikko Glen Fernandez; Marietta P. Rodriguez
2022-Aug-26	MyGeneMyDiet® Nutrition Module 2: Healthy Lifestyle, Healthy Weight (Version 1)	A2022-2027	Copyright	Jacus S. Nacis; Diana Glades A. Domalanta-Ronquillo; Jason Paolo H. Labrador; Aurora Maria Francesca D. Dablo; Julianne Janine V. Carrillo; Marilou M. Lopez-Madrid; Ruby D. Frane; Noelle Lyn C. Santos; Debbie Ann S. Martinez; Dianne Jane V. Fanio; Mikko Glen Fernandez; Marietta P. Rodriguez



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2022-Aug-26	MyGeneMyDiet® Nutrition Module 3: Sustaining a Healthy Weight (Version 1)	A2022-2028	Copyright	Jacus S. Nacis; Diana Glades A. Domalanta- Ronquillo; Jason Paolo H. Labrador; Aurora Maria Francesca D. Dablo; Julianne Janine V. Carrillo; Marilou M. Lopez- Madrid; Ruby D. Frane; Noelle Lyn C. Santos; Debbie Ann S. Martinez; Dianne Jane V. Fanio; Mikko Glen Fernandez; Marietta P. Rodriguez
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2022-Aug-26	MyGeneMyDiet® Nutrition Module 4: Avoiding Weight Relapse (Version 1)	A2022-2029	Copyright	Jacus S. Nacis; Diana Glades A. Domalanta- Ronquillo; Jason Paolo H. Labrador; Aurora Maria Francesca D. Dablo; Julianne Janine V. Carrillo; Marilou M. Lopez- Madrid; Ruby D. Frane; Noelle Lyn C. Santos; Debbie Ann S. Martinez; Dianne Jane V. Fanio; Mikko Glen Fernandez; Marietta P. Rodriguez
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2022-Sept-12	Good Manufacturing Practices (GMP) for Complementary Food Processing Facility (Small Scale Production)	O2022-1828	Copyright	Janel Anne C. Eder; Lea B. Landicho; Jaypy S. De Juan; Engr. Charlie E. Adona; Engr. Jayson G. Tagaroma; Richard L. Alcaraz; Alexis M. Ortiz; Milflor S. Gonzales, Ph.D.; Engr. Rosemarie G. Garcia
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2022-Sept-12	Good Manufacturing Practices (GMP) for Complementary Food Processing Facility (Medium Scale Production)	O2022-1829	Copyright	Janel Anne C. Eder; Lea B. Landicho; Jaypy S. De Juan; Engr. Charlie E. Adona; Engr. Jayson G. Tagaroma; Richard L. Alcaraz; Alexis M. Ortiz; Milflor S. Gonzales, Ph.D.; Engr. Rosemarie G. Garcia
2022-Sept-12	Good Manufacturing Practices (GMP) for Complementary Food Processing Facility (Large Scale Production)	O2022-1830	Copyright	Janel Anne C. Eder; Lea B. Landicho; Jaypy S. De Juan; Engr. Charlie E. Adona; Engr. Jayson G. Tagaroma; Richard L. Alcaraz; Alexis M. Ortiz; Milflor S. Gonzales, Ph.D.; Engr. Rosemarie G. Garcia
2022-Sept-12	eKusina-Munggo Curry	L2022-430	Copyright	May Ann D. Gironella; Idelia G. Glorioso; Erika Niña C. Bacolod; Eirene Agustin B. Arnejo; Shannen Faye Q. Arevalo; Veronica Vianca C. Salazar; Christelle Lois T. Bayalas; Mark Gerald J. Ba-ay; Eva L. Rebato; Milflor S. Gonzales, Ph.D.
2022-Sept-12	eKusina-Pork-Tomato Fried Rice with Veggies	L2022-431	Copyright	May Ann D. Gironella; Idelia G. Glorioso; Erika Niña C. Bacolod; Eirene Agustin B. Arnejo; Shannen Faye Q. Arevalo; Veronica Vianca C. Salazar; Christelle Lois T. Bayalas; Mark Gerald J. Ba-ay; Eva L. Rebato; Milflor S. Gonzales, Ph.D.





2022-Sept-12	eKusina-Shrimp-Veggie Okoy	L2022-432	Copyright	May Ann D. Gironella; Idelia G. Glorioso; Erika Niña C. Bacolod; Eirene Agustin B. Arnejo; Shannen Faye Q. Arevalo; Veronica Vianca C. Salazar; Christelle Lois T. Bayalas; Mark Gerald J. Ba-ay; Eva L. Rebato; Milflor S. Gonzales, Ph.D.
2022-Sept-12	eKusina-Tokwa Mechado	L2022-433	Copyright	May Ann D. Gironella; Idelia G. Glorioso; Erika Niña C. Bacolod; Eirene Agustin B. Arnejo; Shannen Faye Q. Arevalo; Veronica Vianca C. Salazar; Christelle Lois T. Bayalas; Mark Gerald J. Ba-ay; Eva L. Rebato; Milflor S. Gonzales, Ph.D.
2022-Oct-18	Healthy Aging Program for Pinoy Senior Citizens: Audiovisual Presentation	L2022-470	Copyright	Robby Carlo A. Tan; Chelcey Lauren T. Lim; Magnolia B. Velasquez; Hazel T. Lat; David Kenneth C. Mendoza; Kyler Kenn M. Castilla; Valen Lou Amour N. Namocatcat; Mark Kim B. Torres; Maria Anna Nicole B. Viri; Kristine D. Macatangay; Princess Ann G. Española; Imelda Angeles-Agdeppa, Ph.D.
2022-Oct-18	Nutrition Physiology Laboratory: Audiovisual Presentation	L2022-471	Copyright	Robby Carlo A. Tan; Magnolia B. Velasquez; Chelcey Lauren T. Lim; Hazel T. Lat; David Kenneth C. Mendoza



2022-Oct-18	Nutrition Physiology Laboratory Brochure	O2022-2772	Copyright	Robby Carlo A. Tan; Chelcey Lauren T. Lim; Magnolia B. Velasquez; Kyler Kenn M. Castilla; Mark Kim B. Torres; Hazel T. Lat; David Kenneth C. Mendoza
2022-Oct-18	Technology Manual on the Production of Rice-Mongo Curls (Medium Scale)	O2022-2767	Copyright	Engr. Charlie E. Adona; Alex M. Palomo; Richard L. Alcaraz; Engr. Jayson G. Tagaroma
2022-Oct-18	Technology Manual on the Production of Rice-Mongo Instant Blend (Medium Scale)	O2022-2770	Copyright	Engr. Charlie E. Adona; Alex M. Palomo; Richard L. Alcaraz; Engr. Jayson G. Tagaroma
2022-Oct-18	Technology Manual on the Production of Rice-Mongo Curls and Instant Blend (Medium Scale)	O2022-2769	Copyright	Engr. Charlie E. Adona; Alex M. Palomo; Richard L. Alcaraz; Engr. Jayson G. Tagaroma
2022-Oct-18	Technology Manual on the Production of Rice-Mongo Crunchies (Medium Scale)	O2022-2771	Copyright	Engr. Charlie E. Adona; Alex M. Palomo; Richard L. Alcaraz; Engr. Jayson G. Tagaroma
2022-Oct-18	Technology Manual on the Production of Ready-to-Cook Rice-Mongo-Sesame Blend (Medium Scale)	O2022-2768	Copyright	Engr. Charlie E. Adona; Alex M. Palomo; Richard L. Alcaraz; Engr. Jayson G. Tagaroma
2022-Nov-24	DOST-FNRI Food Safety Grading System Tools AVP: Introduction	L2022-485	Copyright	Eirene Agustin B. Arnejo; May Ann D. Gironella; Jalyssa Camil G. Samonte; Claire M. Gacias; Kelvin Andrew D. Kua

2022-Nov-24	DOST-FNRI Food Safety Grading System Tools AVP: Food Inspection Checklist (FIC)	L2022-484	Copyright	Eirene Agustin B. Arnejo; May Ann D. Gironella; Jalyssa Camil G. Samonte; Claire M. Gacias; Kelvin Andrew D. Kua
2022-Nov-24	DOST-FNRI Food Safety Grading System Tools AVP: Code of Standards (COS)	L2022-482	Copyright	Eirene Agustin B. Arnejo; May Ann D. Gironella; Jalyssa Camil G. Samonte; Claire M. Gacias; Kelvin Andrew D. Kua
2022-Nov-24	DOST-FNRI Food Safety Grading System Tools AVP: Operations Manual (OM)	L2022-481	Copyright	Eirene Agustin B. Arnejo; May Ann D. Gironella; Jalyssa Camil G. Samonte; Claire M. Gacias; Kelvin Andrew D. Kua
2022-Nov-24	DOST-FNRI Food Safety Grading System Tools AVP: Feedback from Stakeholders	L2022-483	Copyright	Eirene Agustin B. Arnejo; May Ann D. Gironella; Jalyssa Camil G. Samonte; Claire M. Gacias; Kelvin Andrew D. Kua
2022-Nov-24	Ang Mahiwagang Pinggang Pinoy ng Nutrilandia Chapter 1	L2022-480	Copyright	Idelia G. Glorioso; Shannen Faye Q. Arevalo; Maja Bethzaida S. Decena; Theresa Krista B. Jolejole; Andrea Marie P. Malit; Milflor S. Gonzales, Ph.D.

## APPROVED TRADEMARKS

2022-April-14	DOST-FNRI's Filipino Food Collection	4-2022-502405	Trademark	John Mark M. Villanueva; Salvador R. Serrano; Jaypy S. De Juan; Alexis M. Ortiz; Idelia G. Glorioso; Milflor S. Gonzales, Ph.D.
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2022-April-14	FIRSt	4-2022-502406	Trademark	Dexter Y. De Leon
2022-Aug-18	SAGIP Logo	4-2022-507329	Trademark	Noelle Lyn C. Santos; Robby Carlo A. Tan; Hazel T. Lat; Kyler Kenn M. Cas- tilla; Edward Vincent J. Magtibay



# SCIENCE PROMOTION PROGRAMS

## LABORATORY SERVICES

The DOST-FNRI Service Laboratory served **265 customers** including firms, researchers, and students. With these biological, chemical and microbiological analyses, the DOST-FNRI-SL generated income amounts to **Php 2,181,449.00**.

KPIs	Bio	Chem	Mic	Total
<b>No. of samples received</b>	4,586	285	296	5,167
<b>No. of test conducted</b>	150,874	51,814	915	203,603
Service Laboratory	4,590	1,170	915	6,675
NNS Sample	146,284	50,644	NA	196,928
<b>No. of customers served (warm bodies)</b>	44	121	100	265
<b>No. of new customers served</b>		88		88
<b>No. of firms served</b>		97		97
<b>Total fees collected</b>				
Cash	Php 200,674.00	Php 1,481,855.00	Php 498,920.00	Php 2,181,449.00
In-kind	Php 865,555.00	Php 216,416.00	Php 29,320.00	Php 1,111,291.00
Value for Assistance – Discounts	Php 1,120.00	Php 190,913.00	Php 48,800.00	Php 240,833.00
Value for Assistance – Gratis	Php 72,800.00	Php 34,780.00	Php 8,550.00	Php 116,130.00
Value for Assistance – NNS	Php 59,822,730.00	Php 14,873,200.00	NA	Php 74,695,930.00
<b>Customer Satisfaction Index</b>	100% Outstanding	97% Outstanding	98% Outstanding	98% Outstanding



# LIBRARY SERVICES

Dexter Y. De Leon, Glenn Joy B. Abad, Alexis M. Ortiz, Ma. Corazon E. Palompo, and Milflor S. Gonzales, Ph.D.

## FOOD AND NUTRITION INFORMATION RESOURCE STATION (FIRST) SERVICES

The DOST-FNRI Food and Nutrition Information Resources Station (FIRST) continuously provided services during the ongoing COVID-19 pandemic. FIRST provided information services to 127 walk-in clients and served 891 online clients. DOST SciNet got 159,646 hits from various government agencies, private companies, NUTRINET members, private agencies, food industries, media partners, universities and colleges. It also catered to 724 library users for use of library facilities.

FIRST also conducted activities to promote the library, its resources and services. The activities include the FIRST Services Orientation (Virtual or Face-to-face), FIRST Virtual Space, Digitization and FIRST Virtual Book Exhibit.

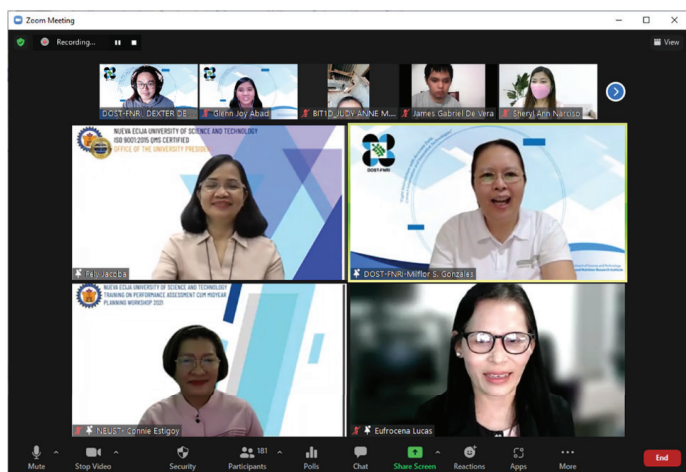
The FIRST Services Orientation (virtual or face-to-face) provides an overview about FIRST and its services which includes information about the operating hours, location, staff, contact details and the collection. The orientations that were conducted with the following:

- Nueva Ecija University of Science and Technology (NEUST) - February 28, 2022;
- Southern Leyte State University (SLSU) - April 20, 2022;
- Philippine Science High School (PSHS) - July 7, 2022;
- Bicol University - July 20, 2022; and
- DOST-STII LIS month celebration participants - November 16, 2022.

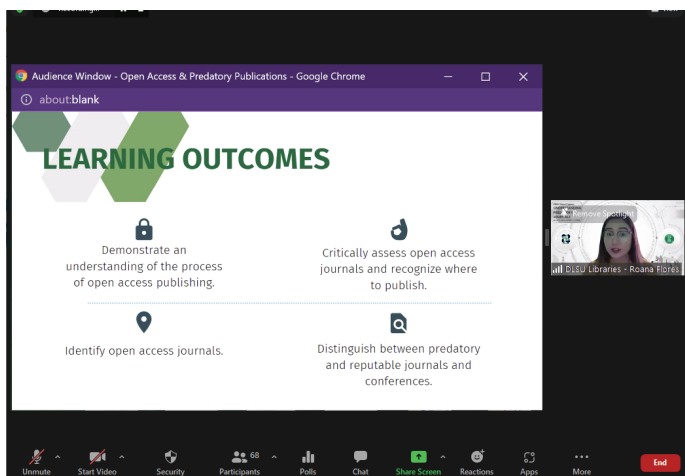


The FIRST Virtual Space is a webinar which aims to educate researchers and technical writers of the Institute about effective research. Four (4) virtual space webinars were conducted via Zoom with the following topics:

- Open Access and Predatory Journals (March 18, 2022) - 59 participants;
- Basics of Intellectual Property (April 26, 2022) - 78 participants;
- Avoiding Pitfalls in Writing Review of Related Literature (RRL) (September 30, 2022) - 60 participants; and
- Spotting Credible Sources in the Digital Environment (December 7, 2022) - 29 participants.



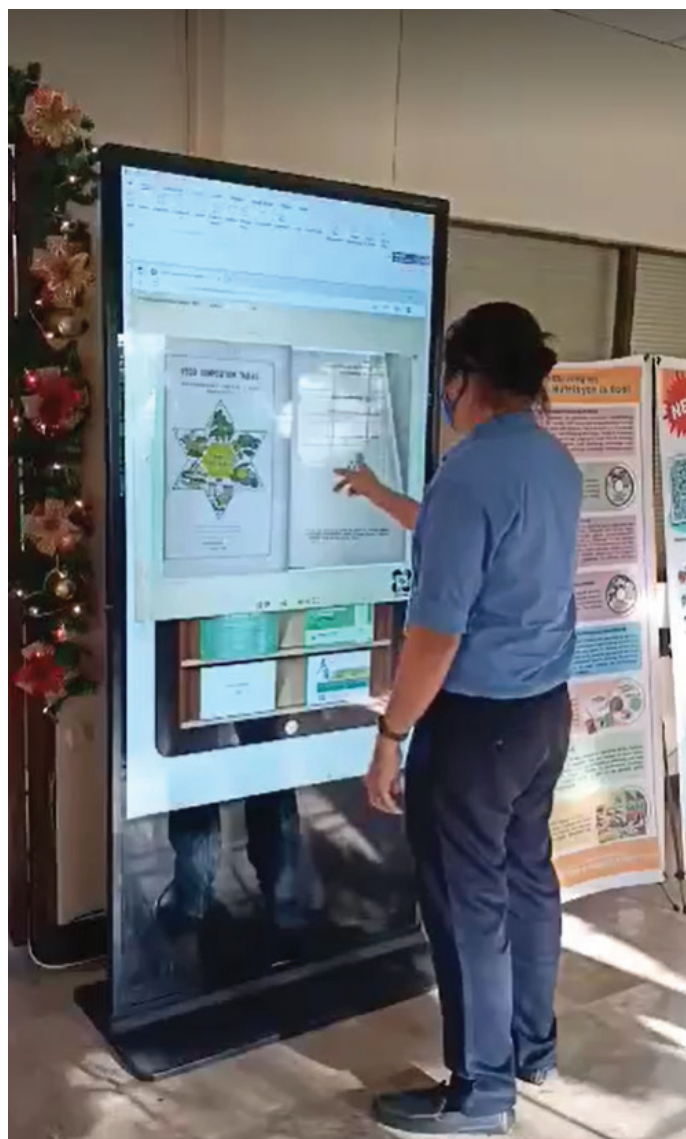




Moreover, one of FIRST's goals is to preserve DOST-FNRI's publications in order for the present and future generation of researchers inside and outside the Institute to use it for reference. In October 2022, an upgraded document or book scanner was acquired for a better digitization of information materials. A total of 135 FIRST Collection including publications, theses and dissertations were digitized in 2022.



Lastly, the FIRST Virtual Book Exhibit showcased the major DOST-FNRI publications. The virtual exhibit was displayed on an interactive kiosks at the lobby of the Institute and main entrance of the Station. It was also posted in the

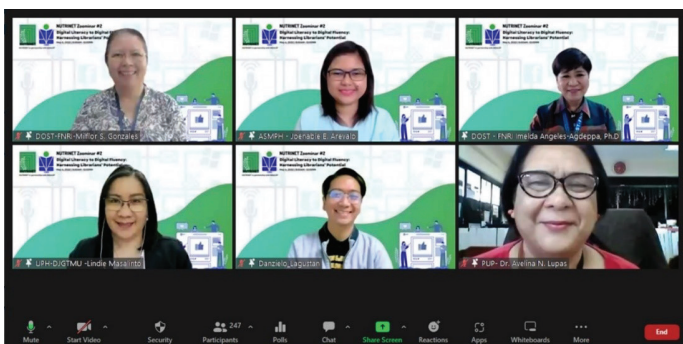


Facebook pages of DOST-FNRI and Nutrition Research Information Network (NUTRINET). This activity was also a part of the 32nd Library and Information Services Month with the theme "*Mga aklatan bilang kanlungan ng karunungan: tagapangalaga ng kultura at pamanang lokal*".



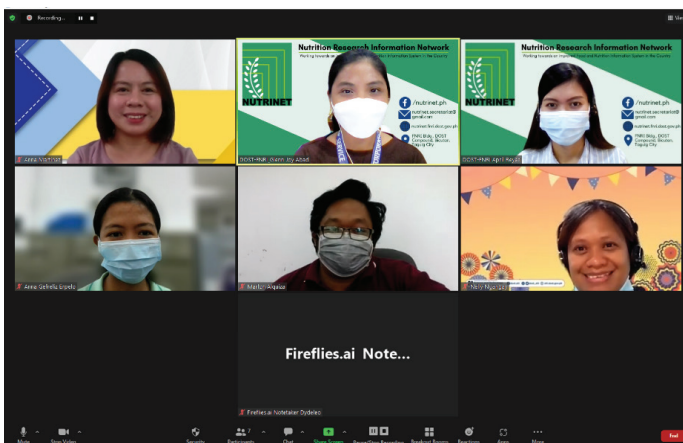
# NUTRITION RESEARCH INFORMATION NETWORK (NUTRINET)

The Nutrition Research Information Network (NUTRINET), in partnership with Medical and Health Librarians' Association of the Philippines (MAHLAP), organized the NUTRINET Zoominar. It is a webinar for librarians and information professionals to continuously learn concepts and enhance skills amidst the pandemic.

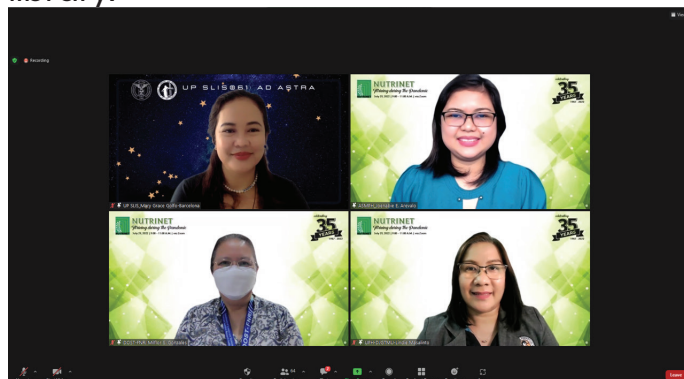


NUTRINET and MAHLAP organized two Zoominars for 2022. The first was conducted on May 6, 2022 via Zoom titled NUTRINET Zoominar #2: Digital Literacy to Digital Fluency: Harnessing Librarians' Potential. The second was NUTRINET Zoominar #3: Setting-up a Digital Repository with Limited Resources conducted on November 16, 2022 via Zoom. Ms. Joenabie E. Arevalo, librarian of the Ateneo de Manila University School of Medicine and Public Health (ASMPH) was the resource person for both webinars.

Further, on June 8, 2022, an Adopt-A-Library (AAL) virtual monitoring was conducted with the librarians of University of Rizal System-Tanay via Zoom. AAL project aims to help build the capability of needy libraries



of schools offering food, nutrition and other related courses in terms of upgrading their collection. The virtual monitoring is follow-through on the status and usefulness of the donated publications in the community and coordinate other means on how can NUTRINET be of assistance to the adopted library.



In addition, NUTRINET also celebrated its 35th Anniversary on July 29, 2022 via Zoom with the theme "NUTRINET Thriving during the Pandemic". Asst. Prof. Mary Grace Golfo-Barcelona, Dean of School of Library and Information Studies - University of the Philippines Diliman was the Keynote Speaker. She gave an inspiring message for the 61 participants from the NUTRINET Governing Board, Technical Committee members, adopted libraries, partners, and former NUTRINET Members.

The following audio-visual presentations (AVPs) were developed and showcased on the anniversary celebration:

- Milestones of the NUTRINET in the last 35 years and its activities during the pandemic;
- NUTRINET Memorandum of Understanding (MOU) Ceremonial Signing by the Heads of Member-agencies, and
- Testimonials from former NUTRINET members.

As a token of appreciation, a Souvenir Program were distributed to the participants.

# SCIENCE AND TECHNOLOGY PROMOTION SERVICES

In line with the Institute's mission of providing accurate data, correct information and innovative technologies to fight malnutrition, the DOST-FNRI regularly conducted dissemination activities. These included the DOST-FNRI Virtual FNRI Seminar Series, the DOST Multi-Media Nutrition Promotion, IEC packages, Virtual National Science & Technology Week (NSTW), Virtual Nutrition Communication Network (NUTRICOMNET), Nutrition Research Information Network (NUTRINET), among others.

## PROMOTION AND SERVICES RENDERED

Type of Service	Number
As speaker	189
As participant	98
As demonstrator	1
As emcee/moderator/facilitator	8
As consultant/reviewer/critique	43





# DOST-FNRI SOCIAL MEDIA INSIGHTS

Metrics (2022)



## FACEBOOK



### 73,849

#### TOTAL PAGE LIKES

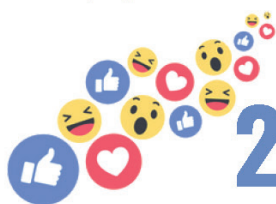
Number of Facebook accounts who like and follow the page



### 1,638,430

#### TOTAL REACH

Number of unique Facebook users who had any content from your Page or about your Page enter their screen.



### 216,426

#### TOTAL ENGAGEMENT

Number of times people have engaged with DOST-FNRI FB Page and Posts through Likes, Shares, Comments and more



#### TOTAL PAGE LIKES

2021 70,979

2022 73,849



#### TOTAL REACH

2021 807,058

2022 1,638,430



#### TOTAL ENGAGEMENT

2021 94,145

2022 216,426

# DOST-FNRI SOCIAL MEDIA INSIGHTS

METRICS (2022)



## TWITTER

**Tweet Impressions:** *Number of Likes and Retweets received*



**Profile Visits:** *Average number of Twitter Profile Visitors*



**Number of Followers**

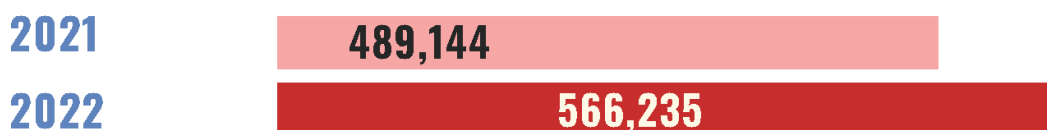


## YouTube

**Total Number of Subscribers:**



**Total Number of Views:**



**Impressions:**

*Likes, Comments*





# OH MY GULAY! SA FNRI

Idelia G. Glorioso, Shannen Faye Q. Arevalo, Christelle Lois T. Bayalas,  
Ma. Corazon E. Palompo, Lucito A. Sila, Erika Niña C. Bacolod, John Mark M. Villanueva,  
and Milflor S. Gonzales, Ph.D.

The Oh My Gulay! sa FNRI edible garden was expanded and improved in 2022 to include more varieties of vegetables, fruits, herbs, and flowering plants.

In 2022, one of the new features of the OMG Garden is the upcycled-theme corner to encourage DOST-FNRI employees to start and design their own urban garden using the recycled materials that can be found at home or office. Another feature in the OMG is the setting-up of veggie dish garden plots namely nilaga, dinengdeng, laswa and vegetable ensalada. Vegetable ingredients for the four dishes or recipes were grown in the garden to promote the regional and local vegetable dishes as well as the nutrient contents of the vegetables.





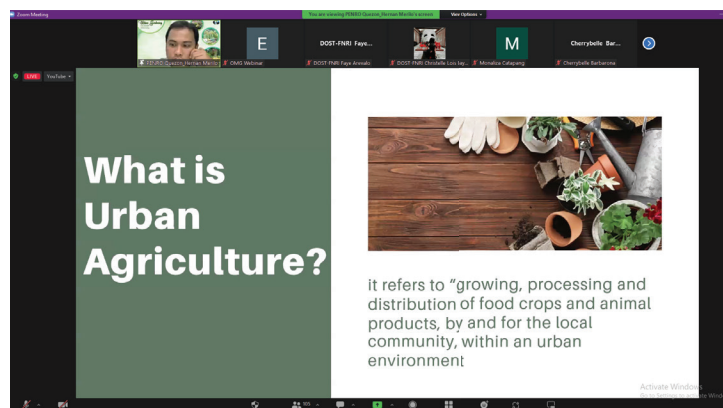


The total weight of vegetables harvested in 2022 was 750.23 kilograms. The harvested vegetables have an estimated worth of Php 75,763.15. Vegetables harvested were given to DOST-FNRI employees as “ayuda” and to visitors, guests and stakeholders as tokens during their visit to the Institute.

Moreover, DOST-FNRI conducted virtual training on Urban Container Gardening Using Repurposed Materials on August 26, 2022 with a resource person from the Department of Agriculture Region IVA. The virtual training was attended by 132 participants.

The garden also showcased the nursery, fruitasan and aquaponics. The DOST-FNRI continues its partnership with Bureau of Fisheries and Aquatic Resources (BFAR) for the supply of tilapia fingerlings for aquaponics.

These OMG activities are fusion of science, creativity, and diversity into an integrated food production technology for nutrition.





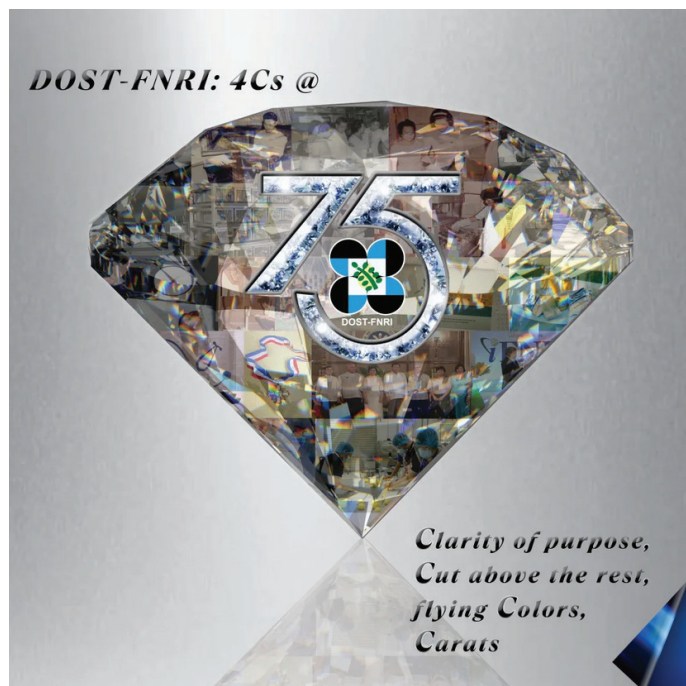
# NEW INFORMATION, EDUCATION, COMMUNICATION (IEC PACKAGES) AND OTHER INNOVATIVE STRATEGIES

Idelia G. Glorioso, Shannen Faye Q. Arevalo, Christelle Lois T. Bayalas, Ma. Corazon E. Palompo, Lucito A. Sila, Erika Niña C. Bacolod, John Mark M. Villanueva, and Milflor S. Gonzales, Ph.D.

To help change the mindset of Filipinos on food and nutrition through nutrition education by popular audience-specific IEC packages, the Institute developed 51 new and regular print and non-print nutrition information materials for dissemination to various stakeholders.

For regular materials, these included DOST-FNRI Annual Report, eFNRI Digest, eFNRI Updates, Book of Abstracts, Souvenir Program, Menu Guide Calendar and Desk Calendar.

The newly-developed materials for 2022 were as follows:



- **DOST-FNRI Coffee Table Book**
  - highlights the major accomplishments of the Institute for 75 years of existence presented in hard cover and large photos. The

theme of the Coffee Table Book is DOST-FNRI: 4 Cs @ 75... Clarity of purpose, Cut above the rest, flying Colors, Carats



- **DOST- FNRI 75th Anniversary Video**
  - a storytelling style AVP. Past and present DOST-FNRI Directors were interviewed about their experiences and the Institute's milestones during their terms.
- **Nutrition Cartoon - Chapters 2 and 3**
  - teaching food and nutrition concepts with cartoons. Chapters 2 and 3 focuses on the adventure of the characters in the nutrition cartoons to discover the teachings of *Pinggang Pinoy*® and apply it in everyday lives.
- **NutriQuest and The Healthy Brain App**
  - These online nutrition games aim to help create positive mindset among schoolchildren on healthy eating through popularized packages of research-based data and

information. These nutrition tools can be used by public and private school teachers of schoolchildren aged 6–9 years old and will be helpful in intensifying nutrition education among Filipino children particularly on Go, Grow and Glow foods.

For non-print materials, the Institute developed 12 videos/MTVs focusing on easy and affordable recipes from “ayuda”. These MTVs were shown and aired in all Mercury TV nationwide.



The team published manuscript titled “Developing and pre-testing of nutrition cartoon video to promote healthy eating among hearing and deaf and mute children” in Malaysian Journal of Nutrition (MJN), December 2022 issue. The paper described the development process of the nutrition cartoon video and explored the participants’ acceptance towards it. Overall, the participants had positive perceptions on the nutrition cartoon video. The video can be used in nutrition education classes among hearing and deaf and mute children, and serves as a tool to measure children’s nutrition knowledge on healthy eating.



Mal J Nutr 28(3): 409-422, 2022

### Developing and pre-testing of nutrition cartoon video to promote healthy eating among hearing and deaf and mute children

Idelia G. Glorioso\*, Shannen Faye Q. Arevalo, Maja Bethsaida S. Decena, Theresa Krista B. Jolejole & Milflor S. Gonzales

Food and Nutrition Research Institute, Department of Science and Technology DOST Compound, General Santos Avenue, Bicutan, Taguig City, Philippines

#### ABSTRACT

**Introduction:** A six-minute nutrition cartoon video “The Magical Pinggang Pinoy in Nutrilandia” was developed and pre-tested to encourage hearing and deaf and mute children to eat a variety of foods by following the Pinggang Pinoy® (Healthy Plate). This study described the development process of the nutrition cartoon video and explored the participants’ acceptance towards it. **Methods:** The video underwent two levels of pre-testing to ensure comprehensibility, attractiveness, acceptability, and self-involvement. The first level was conducted among three DOST-FNRI experts, while the second level was among six deaf-mute school teachers and 30 mothers/ caregivers of 6-9 years old hearing children. Data were collected through an online self-administered questionnaire. Open-ended questions allowed participants to express themselves freely on the given subjects. Data analysis used thematic analysis. **Results:** The video conveyed clear information on the Pinggang Pinoy®, and the inclusion of animation, subtitles, visuals, and voice-over made the video easier to understand. Participants stated that the message of the video was directed to children, teens, adults, malnourished people, and everyone in general. Pre-testing the nutrition cartoon video before final production identified terminologies and concepts that participants found unfamiliar, confusing and unacceptable; offered suggestions for improvement and made pre-tested video appropriate for hearing and deaf-mute children. **Conclusion:** Overall, the participants had positive perceptions on the nutrition cartoon video. The video can be used in nutrition education classes among hearing and deaf and mute children, and serves as a tool to measure children’s nutrition knowledge on healthy eating.

**Keywords:** cartoon video, healthy eating, hearing and deaf and mute children, nutrition education, pre-testing

#### INTRODUCTION

Nutrition education is any combination of educational strategies, accompanied by environmental support, designed to facilitate voluntary adoption of food

choices and other food- and nutrition-related behaviours conducive to health and well-being (Contento, 2007). Thus, nutrition education programme can be developed for early childhood education

\*Corresponding author: Idelia G. Glorioso  
Supervising Science Research Specialist, Food and Nutrition Research Institute  
Department of Science and Technology, DOST Compound, Bicutan, Taguig City, Philippines  
Tel: (63) 837-20-71 local 2287; Fax: (63) 837-2934  
E-mail: msidelag@yahoo.com/msidelagforoso@gmail.com  
doi: <https://doi.org/10.31246/mjn-2021-0127>



# 2022 FNRI SEMINAR SERIES



The DOST-FNRI in partnership with the FNRI Employees' Association Inc. (FNRI EA Inc.) successfully conducted its 48th FNRI Seminar Series (FSS) last July 7 - 8, 2022 held at The Manila Hotel, Ermita, Manila with the theme "Inobasyon at Solusyon sa Panibagong Hamon sa Nutrisyon." The hybrid seminar series highlighted the food and nutrition researches of the Institute at the peak of the COVID-19 pandemic. The annual event was attended by 812 registered onsite and online participants from the academe, research organizations, government agencies, non-government organizations, private sector, media, industries, and colleagues from the Institute.

Before the event, a pre-FSS activity was conducted virtually, with 129 online participants, last June 30, 2022, to showcase the promising research findings of undergraduate students through an oral presentation. The Undergraduate Students Research Competition received 11 entries from 7 universities nationwide. After the preliminary judging, five (5) research projects made it to the competition - 2 for the Food Technology/Food Science category and 3 for the Nutrition/Dietetics

category. The research studies titled "Detection of molds in peanut seeds using image analysis and machine learning" and "The qualitative study on the experiences of the Registered Nutritionist-Dietitians (RND) in the hospital, food industry, and public health setting during the COVID-19 crisis in the Philippines" were the top entries for the two categories.

The highlight of the 2023 FSS was the 2-day Scientific Technical Program comprising of 1 Plenary Session and 6 Technical Sessions. A total of 20 research papers were orally presented by the DOST-FNRI researchers. The Plenary Session on "R & D Innovations and Solutions: Tugon Laban sa Malnutrisyon, Pag-usapan Natin" featured the State of Child Undernutrition in the Philippines and two (2) of the most recent food innovations of the DOST-FNRI, MeaLusog, a healthy meal made instant and Coconut complementary products. Three (3) panel reactors from the Department of Social Welfare and Development (DSWD), Department of Education (DepEd), and Swisspharma Research Laboratories, Inc. were invited to give insights on how the products may be of help to their programs and business venture.

The topics for the technical sessions were as follows:

Technical Session 1: Innovative Food Products Towards a Well-Nourished Nation

Technical Session 2: Your Genes, Your Lifestyle, and Your Health

Technical Session 3: Tools and Guidelines for a Healthier You

Technical Session 4: Lessons from Nutrition Surveys: Solutions to Curb Malnutrition in the Now Normal

Technical Session 5: Nutrition Interventions and Policy Studies in the Now Normal

Technical Session 6: DOST-FNRI Graduate Thesis Presentation

Apart from the oral presentation, a total of 31 entries were received for the Scientific Poster Competition. These include 29 scientific posters from the DOST-FNRI completed research projects and 2 from the DOST-FNRI graduate students.

The digital Scientific Poster Competition paved the way for the researchers to communicate the results of their studies through interactive presentations. The scientific poster titled “A plus in the BMI is maybe all in the mind (And in the genes, too)” got the top spot for the Scientific Poster Competition while the People’s Choice was awarded for the poster titled “Uprooting hunger and malnutrition in the new normal with enhanced nutribun sweetpotato variant”. The Outstanding Graduate Student Poster was given to the poster titled “Nutrition information Consumption and utilization behavior of selected Filipino working adults during the COVID-19 pandemic”.

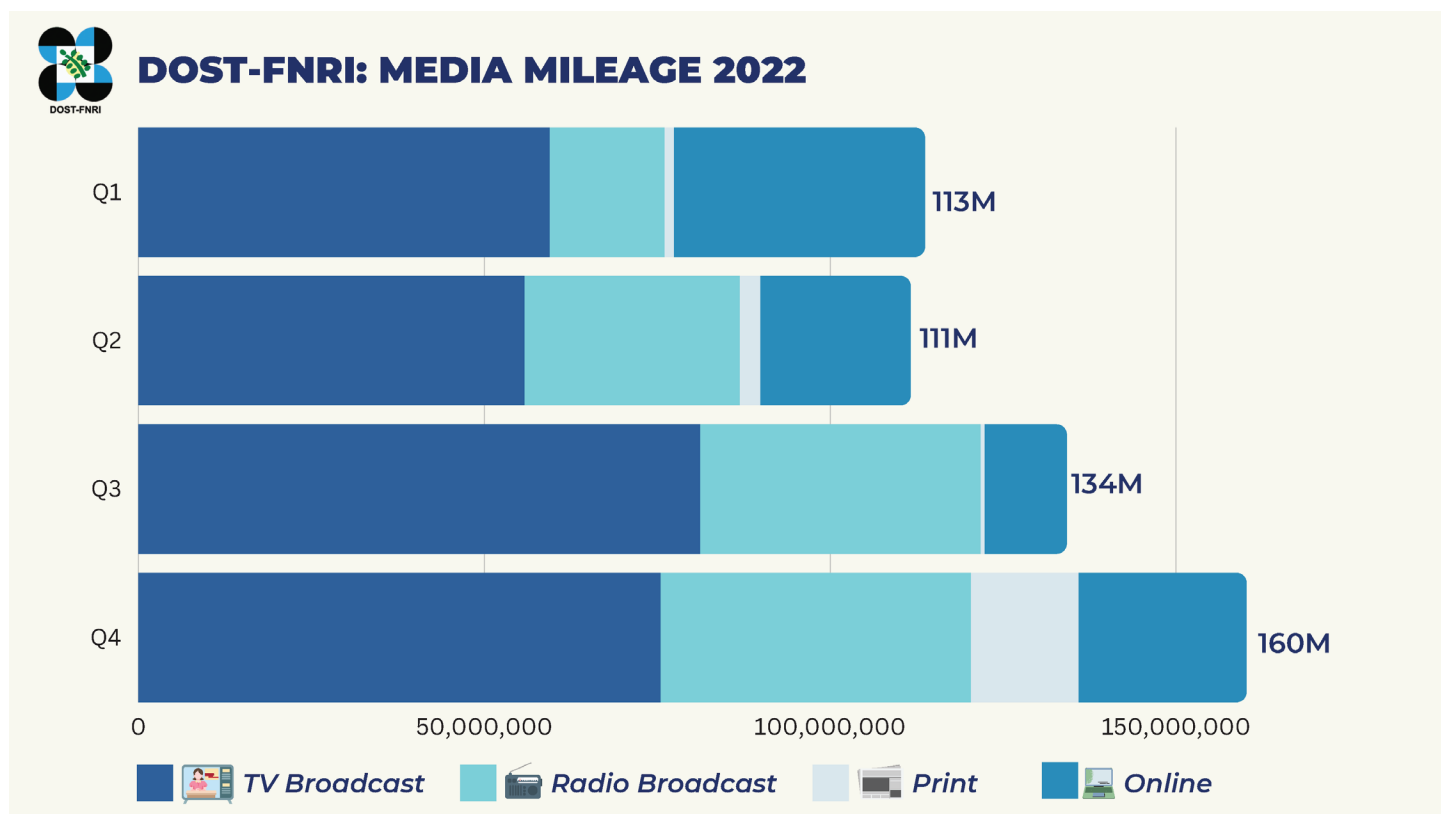
The winners of the Undergraduate Student Research Competition and Scientific Poster Competition were awarded during the Closing Ceremonies.







**The 48th FNRI Seminar Series Organizing Committee**



# MULTIMEDIA NUTRITION PROMOTION (MEDIA MILEAGE)



DOST-FNRI MEDIA MILEAGE REPORT 2022				
				
	TV Broadcast	Radio Broadcast	Print	Online
<b>Q1: 113M</b>	59M	16M	1.3M	36M
<b>Q2: 111M</b>	55M	31M	2.9M	21M
<b>Q3: 134M</b>	81M	40M	568K	11M
<b>Q4: 160M</b>	75M	44M	15M	24M
<b>TOTAL: 519M</b>				





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GOVERNMENT AND  
INTERNATIONAL  
STI COLLABORATIONS**

# 2022 CONTRACT RESEARCHES AND OTHER COLLABORATIVE PROJECTS ON FOOD AND NUTRITION



## PHP 61,500,787.70

**Contract Researches and Other Collaborative Projects on Food and Nutrition**

Name of Business/ Organization & Contact person	Title/Description	Project Duration		Responsible Person	Funds (Php)
		Start	End		
Government Agencies					
DOST-NCR	NCR-48th FNRI Seminar Series on Food & Nutrition Researches & Science & Technology Activities	June 2022	Sept. 2022	Jacus S. Nacis	292,000.00
DOST	Relationship of Body Composition to the Functional Capacity and Quality of Life of Older Filipinos in Selected Provinces in the Philippines	Mar. 15 2022	Mar. 14 2023	Robby Carlo A. Tan	5,824,954.53
DOST-NCR	Project on Supporting Adolescent Growth in the Philippines (PROJECT SAGIP): A Pilot Study in Marikina City Phase 2	Mar. 2022	Aug. 2022	Noelle Lyn C. Santos	5,000,000.00
PCHRD	Evaluation on the Benefits of Coconut Milk Blended with Different Types of Animal	May 9, 2022	May 8, 2023	Imelda Angeles-Agdeppa, Ph.D.	3,867,966.40

DOST	Managing the Nutritional Needs of Older Filipino With Due Attention of Preteen Nutrition of Functional Health (MANO PO)	July 01, 2022	June 30, 2023	Hazel T. Lat	2,272,945.20
DOST Yr 1	Proj. 1 Identification of Genetic Variants Associated with Children Growth & Development in a Filipino Birth Cohort Eastern Visayas	July 01, 2022	June 30, 2023	Michael E. Serafico	2,268,202.50
DOST Yr 1	Proj. 2 Nutritional Status and Maternal Lifestyle Among Pregnant Women in Samar & Biliran and Its Relation to Pregnancy Outcome during the First 1000 days	July 01, 2022	June 30, 2023	Jacus S. Nacis	7,025,938.10
DOST Yr 1	Proj. 3 Infant Gut Microbiota and Linear Growth: a Longitudinal Study of the Eastern Visayas Birth Cohort	July 01, 2022	June 30, 2023	Jacus S. Nacis	2,867,223.90
DOST Yr 1	Proj. 4 Linking the Metabiome with Genetic Variation Nutrition & Gut Microbiome	July 01, 2022	June 30, 2023	Jacus S. Nacis	11,456,692.20
DOST	Development & Pilot Scale Production of Innovative Food Products for Older Filipinos	July 01, 2022	June 30, 2023	Vannizsa I. Ramas	3,589,311.68
PCHRD	Bioequivalence of Virgin Coconut Oil among Health Filipino Male Adults: An Exploratory Pharmacokinetic Study	July 01, 2022	June 30, 2023	Carl Vincent D. Cabanilla	3,371,518.73





PCHRD	Technology Generation for the Production of Fortified Milk – Dairy Blend Yr 2	Aug. 2022	Dec. 2023	Abbie L. Padrones	3,053,075.58
NRCP	A Policy Assessment: Nutrition Act of the Philippine Across Different Levels of Governance	Oct. 2022	Sept. 30, 2023	Marie T. Bugas, Ph.D.	4,440,263.00
PHILMECH	Training on Microbiological Methods for Food Analysis			Josefina T. Gonzales	110,000.00
PCIEERD	Predicting Malnutrition among under five years old with the use of classification Techniques in Data Mining			Mae Ann SA. Javier	1,000,000.00
Bureau of Quarantine	Training			Victor Franco J. Alfonso, Jr.	110,000.00

### International Funding Agency

MRAG–Asia Pacific, and Oceania Philippines	State of Fish Intake in Nutrition System	Jan. 2022	June 2022	Imelda Angeles-Agdeppa, Ph.D Eva A. Goyena, Ph.D Charina A. Javier Eldridge Ferrer	500,000.00
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## Private Industry

WYETH	Nutrient & Immunity Status in Children	April 2022	April 2023	Imelda Angeles-Agdeppa, Ph.D.	2,147,243.88
Hypertension	Establishing Blood Pressure Norms for Filipino Children 3.0 to 17.9 Yrs Old	Jan 2022	Dec 2022	Imelda Angeles-Agdeppa, Ph.D. Chona F. Patalen	800,000.00
Societe Des Produits Nestle	My Menu			Imelda Angeles-Agdeppa, Ph.D.	625,237.00
Pure Earth Phils.	Inclusion of Blood Lead Level (BLL) as Biomarker for Selected Children Ages 6-9 and Selected Pregnant Women in 13 Areas of the ENNS 2021			Charmaine A. Duante	728,215.00

## Foundations/Professional Organizations/Individuals

Wesleyan	OJT Training Fee			Josefina T. Gonzales	100,000.00
Dr. Consignado	Training Course on Proficiency Testing			Celina Ann J. Navarro	50,000.00

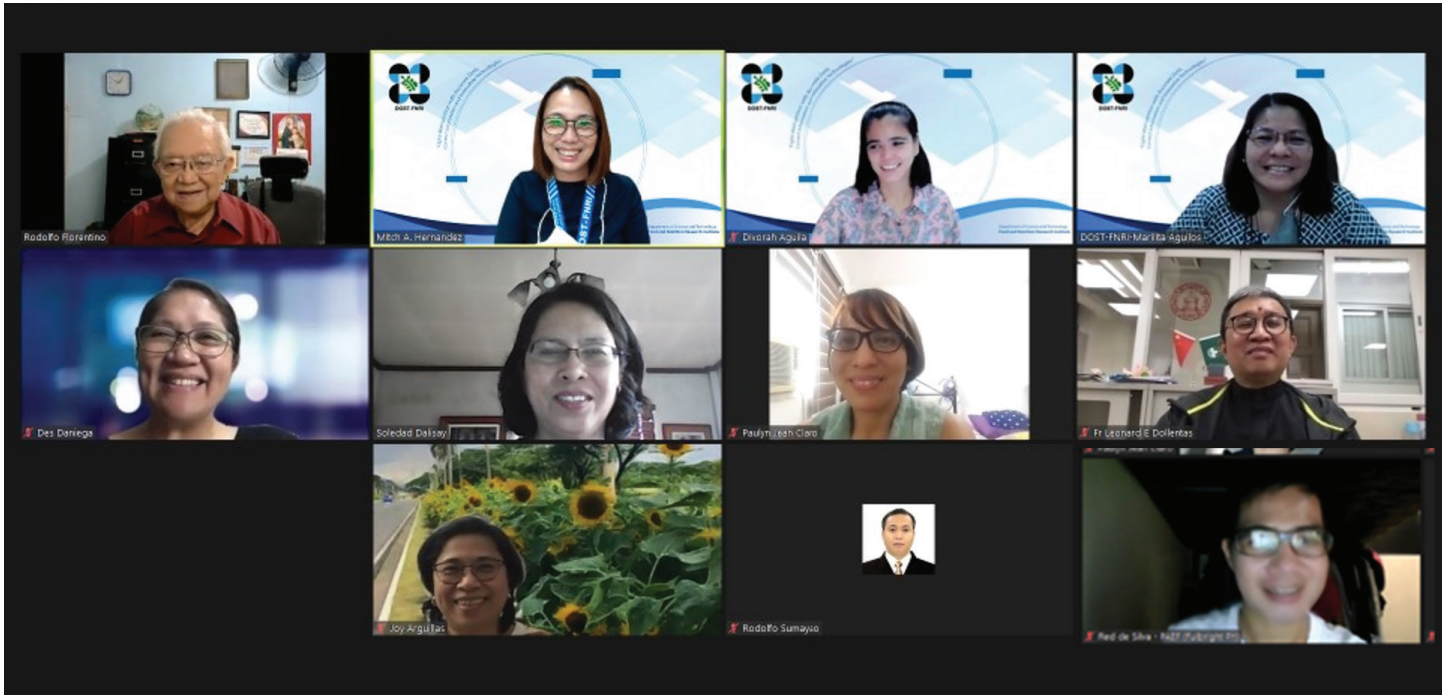




**UPGRADE STI  
FACILITIES  
AND CAPACITIES TO  
IMPROVE  
S&T SERVICES**



# PROTECTING HUMAN PARTICIPANTS IN RESEARCH: A JOINT COMMITMENT BY THE FIERC AND DOST-FNRI



The FNRI Institutional Ethics Review Committee (FIERC) continually upholds the human participants' rights, welfare and well-being of DOST-FNRI researches. For 2022, a total of 25 protocols were accepted and screened for ethical clearance and 44 were periodically monitored to ensure compliance of the researchers to ethical principles.

Of the 25 protocols, 6 underwent full review and 9 were for expedited review. The remaining 10 were exempted from ethical clearance since the studies utilized secondary and publicly available data. Initial review of protocols and reporting of progress of on-going projects were done in 8 full board meetings conducted by the FIERC in 2022.

Other than ensuring compliance to ethical principles, the FIERC seeks to capacitate its members and the DOST-FNRI researchers, as well. As such, FIERC members attended the Basic Good Clinical Practice in 21-24 March 2022, 8th General Assembly of the

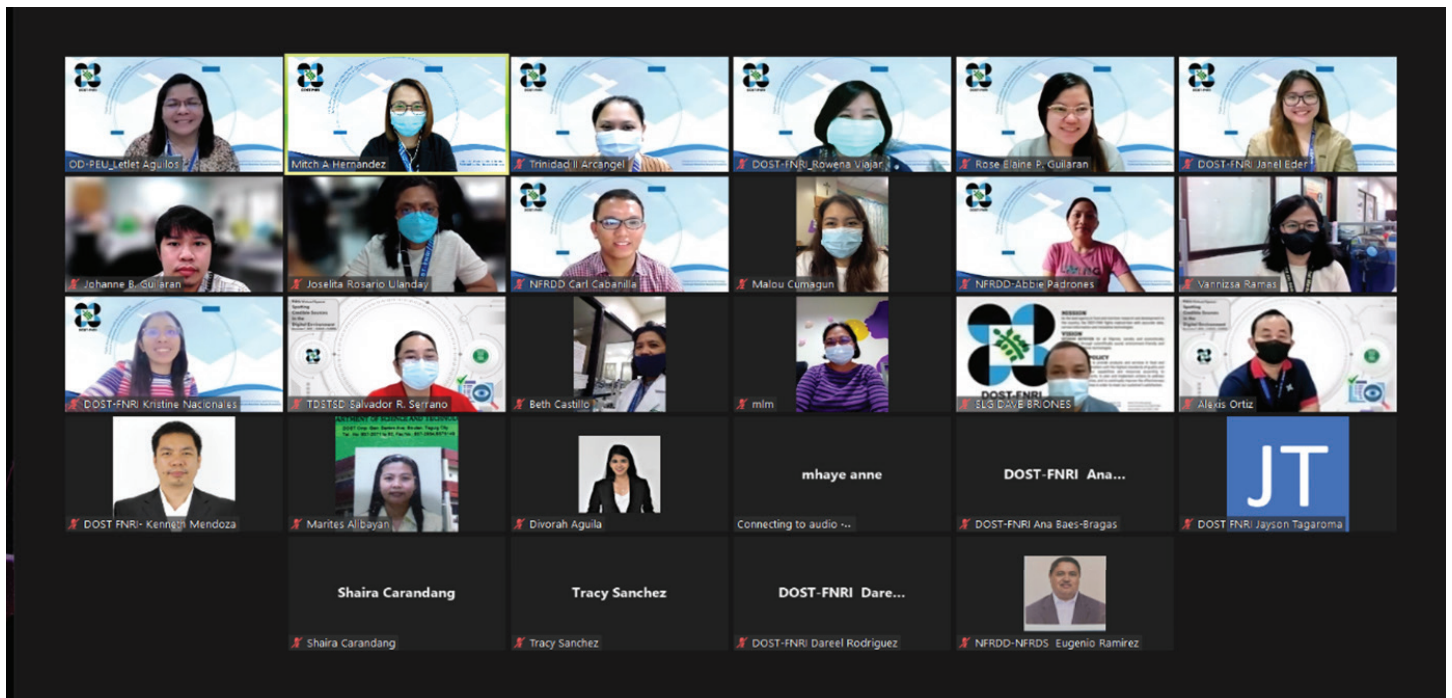
Philippine Health Research Ethics Network or PHREN on October 7, 2022 and Update Training on Good Clinical Practice in 02-04 November 2022. A re-echo of these trainings were conducted on December 9, 2022 with 34 DOST-FNRI researchers in attendance.

To improve its service delivery, a client satisfaction feedback survey among DOST-FNRI proponents was conducted in 2021 and results were disseminated in 2022. In terms of quality and promptness of service and courtesy of the Secretariat in the entire review process from protocol submission to issuance of ethical approval, a rating of very satisfactory to outstanding was garnered by the Secretariat. Suggestions to improve the service, on the other hand, include the conduct of a meeting between the primary reviewers and project proponent at times when a protocol takes more than three (3) resubmissions. The conduct an annual review on accomplishing the forms and to make the forms more user-friendly were also suggested. These will be considered



its SOP will also be strictly observed as the committee prepares for its re-accreditation under Level 3 REC in 2024.

This joint commitment of the FIERC and DOST-FNRI to ensure the efficient review and monitoring of DOST-FNRI researches will result to science-based human friendly protocols and make wise use of government funds/resources.



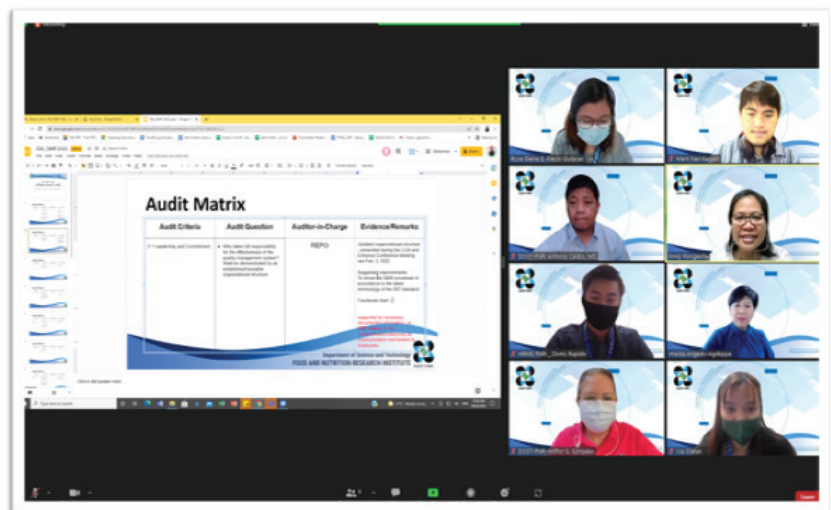


# QUEST FOR PHILIPPINE QUALITY AWARDS (PQA): DOST-FNRI GEARING TOWARDS PERFORMANCE EXCELLENCE THROUGH TOTAL QUALITY MANAGEMENT AND ISO 9001:2015 SUSTAINABILITY

Never just a vision but a continuous mission towards DOST-FNRI work excellence and Total Quality Management through sustainability of ISO 9001:2015 and an eye to level up for the Philippine Quality Award. This lifetime achievement took blood, sweat, and tears to make it what it is today and to soar to greater heights.

In order to stay the course and get back to the grindstone, two (2) new initiatives were planned and proposed by the Project Leader Mr. Jester C. Viriña. One is the online way to monitor and gauge customer satisfaction through the implementation of the “DOST-FNRI Customer Online Feedback System”. This portal is a paperless method of soliciting feedback from both internal and external customers. In this way, the Institute was able to gather any form of feedback on products and services offered to the customers. A more proactive approach allows quicker responses to address comments and complaints. A series of meetings, brainstorming, and coordination with the program developers of the Institute was done in May 2021. With the support of the top Management and collaborative effort to program and make it finalize for initial demonstration until its kick-off this September 2022. More to fully utilize the system, the team continuously putting the effort into advancing more features and centralization to all frontline services.

Secondly, the Adoption of the Quality Management Information System (QMIS) from DOST-CALABARZON. Another system was introduced and adopted by the agency which started through virtual benchmark activity dated November 11, 2021. The privilege given by the DOST-CALABARZON paved the way for the Institute in adopting the system. A Memorandum of Understanding (MOU) was agreed upon and signed by the two parties on August



2022. After a year of collaboration, review, orientation, and pilot testing, the Quality Management Information System (QMIS) was fully acquired by the DOST-FNRI. The adoption of DOST-CALABARZON's QMIS developed a more integrated approach to managing and sustaining Quality Management System (QMS) standards of the Institute. True enough with its main purpose, this electronic way of preparing,





recording, controlling, and maintaining ISO 9001:2015 documented information such as Internal Quality Audit documents, manuals, and other ISO-enrolled forms took effect on December 1, 2022.

Nevertheless, it will never stop here. With the top management's support and continuous initiative to do better, ISO 9001:2015 QMS and PQA will keep the ball rolling as it welcomes another year of the undertaking.

## SUMMARY OF ACTIVITIES

TASKS	COMPLETION DATE	NOTES
Internal Audit	February 8-16, 2022	Successfully conducted by qualified internal auditors; with 33 OFIs and 4 Minor NCs. All were closed.
Management Review	March 8, 2022	7 OFIs were identified and all were closed.
External Audit (TUV Rheinland)	March 23, 2022	A one-day third-party audit was conducted by TUV Rheinland auditors namely Ms. Grace Del Rosario, Messrs. John Francis Faustorilla, and Rolando Remitar. As a result, the Institute has 16 OFIs with no NC noted.
Customer Online Feedback System (COFF)	September 1, 2022	Implemented paperless customer feedback and complaints management
Document Review	November 23, 2022	Overall review and update of ISO manuals aligned to the active procedures of the processes
Quality Management System Information (QMIS)	December 1, 2022	Adopted from DOST-CALABARZON with the approval of the Top Management and support from the MIS team of the Institute
ISO TRAINING	-Root Cause Analysis (RCA) -Risk Identification Tool -ISO Awareness -Orientation of Online Feedback System -Reorientation of QMIS -Internal Auditor's Training -Document Custodian Meeting	Conducted seven (7) virtual training /orientation
ISO Meetings	-1st qtr. QMS -2nd qtr. ROMC -2nd qtr. QMS -1st Document Custodian -3rd qtr. ROMC -1st Internal Auditor's Meeting	Facilitated six (6) virtual meetings to address concerns for proper resolutions

# DOST-FNRI GENDER FOCAL POINT SYSTEM (GFPS): AGENTS IN MAINSTREAMING GENDER AND DEVELOPMENT (GAD) CONCERNS IN THE INSTITUTE

True to its commitment to be the agents in mainstreaming GAD concerns at the DOST-FNRI, the DOST-FNRI-GFPS have successfully staged several activities in 2022, beating the odds and challenges brought about by the continuing COVID-19 pandemic.

Four (4) client-focused projects are continually undertaken in support of the gender and development issues affecting women, adolescent girls, and children. These projects include the Expanded National Nutrition Survey (ENNS), Project Results to Policy Recommendations (PR to PR), Marketing of DOST-FNRI Products and Services (MaPS), and Technology Transfer and Commercialization of DOST-FNRI technologies, products and services.

The ENNS, having been recognized as a project attributable to GAD, was

subjected for evaluation under the Project Implementation and Management, and Monitoring and Evaluation or PIMME. This tool is used to measure a project's sensitivity to GAD as evidenced by support of project leadership, commitment and technical competence of the project management staff to undertake or implement the project's gender equality strategy, among others. This is the first time that the ENNS is being reported as a attributed project. With this tool the ENNS program leaders came to a realization of the need to incorporate more GAD-related concerns in the ENNS to make it more gender-responsive.

The PR to PR project developed 10 policy statements with topics on breastfeeding, vitamin supplementation, and nutritional status of children left behind by OFW parents or caregivers as well as the

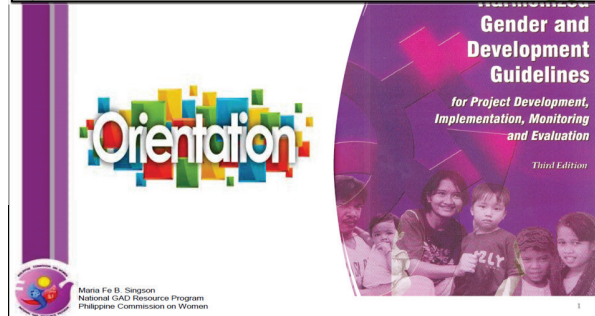
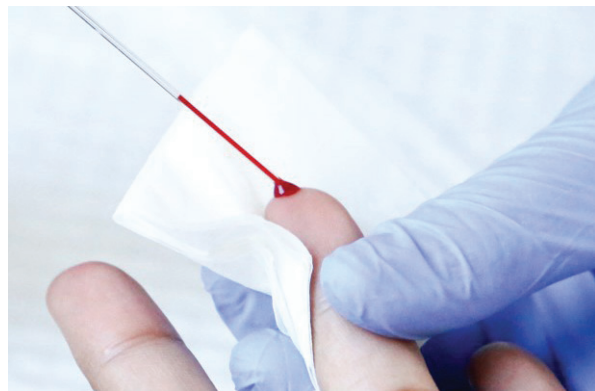




health and nutrition of under-five children belonging to indigenous groups. The MaPs project disseminated various information, education and communication (IEC) materials concerning women, adolescent girls, and children. These were in the form of books, videos, board games, calendars, press releases and scientific write-ups. And through the Technology transfer and commercialization projects, 58% or 84 out of 148 technology adoptors DOST-FNRI food products and technologies were women-owned thereby providing entrepreneurial opportunities for income and employment generation promoting women's economic rights and independence.

For the organization-focused activities, the following were undertaken:

- 2022 National Women's Month: To cap the six-year recurring theme, "We Make Change Work for Women" with the , "Agenda ng Kababaihan, Tungo sa Kaunlaran", the DOST-FNRI GFPS held a photo-gallery exhibit featuring DOST-FNRI Women Directors and Scientists on March 24, 2022. The exhibit started with a Zoom program where some of the featured women leaders/scientists were invited. The highlight of the program was the audio-visual presentation of their accomplishments. The scientific works of the 14 leaders/scientists were displayed at the DOST-FNRI until the end of March 2022 for better appreciation of young researchers in the hope to inspire them to become women leaders/scientists in the future. Sixteen female and 12 male employees viewed the exhibit.
- "Serbisyo para kay Juana": In cooperation with the Service Laboratory Group (SLG) of the Institute, a free hemoglobin testing was conducted among 170 women and 37 men of the DOST-FNRI on March 28-29, 2022. Trained medical





technologists from SLG conducted the hemoglobin testing and results were provided within two (2) days.

- DOST-FNRI Lactation Facility: With the continuous operation and maintenance of the Lactation facility by the Lifestage Nutrition Section (LNS) of the DOST-FNRI, the Institute was certified by the Department of Health (DOH) as a Mother-Baby Friendly Workplace on April 29, 2022. Two DOST-FNRI employees availed of the breastfeeding facility thus providing them with the opportunity to express breastmilk during breastfeeding breaks.
- GAD-related seminars: Two (2) seminars were held in 2022 to continue raising awareness on GAD concerns among DOST-FNRI Employees. The Human Resource Management Section in cooperation with the GFPS held a Gender Sensitivity Webinar last March 25, 2022. 58 Women and 13 men employees participated in this seminar. To further mainstream GAD in DOST-FNRI researches, an orientation activity on the Harmonized Gender and Development Guidelines (HGDG) was conducted on August 17, 2022 via zoom. About 100 DOST-FNRI projects leaders and staff participated in the orientation. Ms. Fe A. Singson, Supervising Science Research Specialist and Program Manager of the DOST GAD Program was the resource person in both of the seminars conducted.
- 18-day campaign to end VAW: In support of the advocacy to end violence against women (VAW), the DOST-FNRI posted a streamer in the front of the DOST-FNRI Building from November 25–December 12, 2022.

- GAD Corner: News updates, pictures and banners of support of GAD activities are posted in the GAD corner in the DOST-FNRI Website.

To continue to be agents on mainstreaming GAD concerns in the Institute, the chairperson and members of the GFPS-TWG also participated in the following activities: DaKILa (Data Knowledge Information Launcher) Virtual Meet in February 23, 2022; DOST GAD Focal Point Assembly held in Mactan, Cebu on October 26–28, 2022; DOST Strategic Planning Workshop on November 16, 2022 via Zoom and the Launching of the 2023 GADtimpala and Presentation of Magna Carta for Women (MCW) Assessment Report on December 15, 2022, La Breza Hotel, Diliman, Quezon City.



## ON-THE-JOB TRAININGS



28

On-the-job trainees

School	Number	Field	Duration
Polytechnic University of the Philippines, Santa Maria Bulacan Campus	1	B.S. in Accounting	November 9, 2021 – January 26, 2022
Technical Education and Skills Development Authority (TESDA)	7	Game Programmer	December 6, 2021 – February 28, 2022
Illinois Wesleyan University	5	IWU internship program	June 7, 2022 – July 29, 2022
Asian Institute of Computer Studies	3	B.S. Computer Science	June 20, 2022 – August 4, 2022
Polytechnic University of the Philippines, Manila	2	Bachelor of Arts in Broadcasting	September 26, 2022 to October 21, 2022
Fisher Valley College, Inc	3	B.S. Information Technology	October 12, 2022 – January 10, 2023
Polytechnic University of the Philippines, Taguig	4	BS. in Accounting	December 1, 2022 – February 15, 2023
The Fisher Valley College, Hagonoy, Taguig City	2	B.S. Information Technology	October 13, 2022 – March 10, 2023
	1	B.S. Computer Science	

## IN-HOUSE TRAINING ORGANIZED AND ATTENDED BY FNRI STAFF



78

In-house trainings

Title	Date	Venue
Employee Orientation on FNRI Policies, Guidelines and Procedures	January 18, 2022	Zoom
Reorientation and Demonstration of IT Support Information System (ITSIS)	February 4, 2022	Zoom

Virtual Forum on Promoting Gender Equality in STEM for Sustainable Development to celebrate the International Day of Women and Girls in Science	February 11, 2022	Zoom
LC-MS/MS virtual training series: Sessions 1-5	February 15, 16 & March 1, 3, 8, 2022	via Microsoft Teams
Virtual Launching of Enhanced Nutribun Orange and Purple Variants	February 16, 2022	Zoom
TDSTSD Thursday Class: Online Hosting & Facilitating	February 17, 2022	DOST-FNRI
TTCS BDU Thursday's Class: Technology Transfer Plan	February 24, 2022	Zoom
Thursday's Class: Monitoring and Evaluation Webinar	March 03, 2022	Zoom
TTCS-BDU's Thursday Class: The Art of Pitching and Business Development	March 10, 2022	Zoom
LC-MS/MS hands-on training	March 10-11, 2022	DOST- FNRI 3rd Floor Laboratory
FNRI Orientation of Newly-hired ICOS/ COS	March 11, 2022	Zoom
From Manuscript to Media: Headlining and Messaging of Write-ups for Online and Social Media	March 14, 2022	Zoom
Halal Certification Awareness	March 16, 2022	Zoom
Year Starter "Alay Mo, Kinabukasan Ko": Solidifying Intersectoral Support Against Malnutrition	March 17, 2022	Zoom
FIRSt Virtual Space: Understanding Open Access and Predatory Journals	March 18, 2022	Via Zoom
Orientation on Zoom Reservation and IT Support Information System	March 21, 2022	FB Live
Data Visualization in Social Media	March 23, 2022	Zoom
DOST-FNRI GFPS-TWG's "Photo Gallery Exhibit of "Women Leaders and Scientists of DOST-FNRI"	March 24, 2022	Zoom
Thursday Class: Thursdate with NAMD	March 24, 2022	Zoom
Gender Sensitivity Webinar	Mar 25, 2022	Zoom





Thursdate with NAMD: Preventing Air-borne Transmissions in the new normal	Mar 31, 2022	Zoom
Front-of-Pack Nutrition Labelling: What Can We Learn from Global Best Practices?	April 4, 2022	Zoom
NAMD Thursdate Class: Let's Talk about Quali	April 7, 2022	Zoom
TRAINING ON USE OF SHIMADZU MOISTURE ANALYZER	April 8, 2022	DOST FNRI 3rd Floor Laboratory
TRAINING ON USE OF MEMMERT VACUUM OVEN VO103	April 8, 2022	DOST FNRI 3rd Floor Laboratory
NAMD Thursdate Class: Beyond Stunting	April 21, 2022	Zoom
FIRSt Virtual Space: Intellectual Property Basics	April 26, 2022	Via Zoom
Online Launching of 8 New Nutritious Food Products for Children, Adults, Pregnant and Lactating Women: "Bagong Produkto, Bagong Pag-asa, Swak sa Masa"	April 27, 2022	Zoom
LACE webinar (Leave Administration Course for Effectiveness	May 4, 2022	Zoom
Webinar on Speaker's Bureau ENGAGING: Engaging Guesting in Interviews & Facilitating ala Storytelling	May 11, 2022	Zoom
Training on Root Cause Analysis for ISO 9001	May 18, 2022	Zoom
NFRDD Thursday Class: How to Write a Good Paper for an International Nutrition Journal	May 19, 2022	Zoom
Government Working Hours and Attendance System Webinar	May 20, 2022	May 20, 2022
OMICSENA Encore: Prospects in Metabolomics-based Nutrition & Health R&D in the Philippines	May 23, 2022	Zoom
Delivering the Best Online and Onsite Presentations: the New Normal Way	May 24, 2022	Zoom
Nutrition Physiology Laboratory Launching Event	May 24, 2022	Zoom
NFRDD Thursday Class: Physical Activity in the New Normal	May 26, 2022	Zoom

Pitching Session on DOST-FNRI's Food Product Development Services	May 26, 2022	Zoom
Safety sa tag-inEAT	May 27, 2022	Zoom
NFRDD Thursday Class: Trip Down the Memory Lane: Lutuín at Subukan ang mga Piling Filipino Merienda	June 2, 2022	Zoom
48th Seminar Series on Food and Nutrition Researches and S & T Activities "Inobasyon at Solusyon sa Panibagong Hamon sa Nutrisyon"	July 7-8, 2022	The Manila Hotel and Zoom
wNFRDD Thursday Class: Safety and Risk Management in the Laboratory: Practicing Safe Science for Good Science	June 9, 2022	Zoom
Safety and Risk Management in the Laboratory: Practicing Safe Science for Good Science	June 9, 2022	via Zoom
Risk and Opportunity Identification and Assessment	June 21, 2022	Zoom
DZRV's Katok Tahanan's special episode for DOST-FNRI's 75th Anniversary	July 5, 2022	Zoom
ISO/IEC 17025:2017 Awareness In-house Training	July 11, 2022	Zoom
The State of Fish in Nutrition Systems in the Philippines	July 12, 2022	DOST-FNRI
Program Development: Linking Performance to Competency Development	July 21, 2022	Zoom
ISO 9001:2015 QMS Awareness	July 28, 2022	Zoom
Orientation/ Demonstration of the Online Feedback System	August 4, 2022	Zoom
How Maps Can Help Attain a Healthier Life?	August 11, 2022	Zoom
GIS Webinar	August 11	Zoom
Orientation on the Harmonized Gender and Development Guidelines (HGDG)	August 17, 2022	Zoom



DOST-FNRI's "Urban container Gardening using Repurposed Materials: Adapting to the New Normal Way of Life"	August 26, 2022	Zoom
FGD Data Analysis and Questionnaire development	September 19-23, 2022	The Acacia Hotel
Echo-webinar on Documenting Quality Management System	September 20, 2022	Zoom
DOST-FNRI's Bringing In Resources for Everyone's Agenda on Kalusugan, Kabuhayan, Kaalaman, at Kabuhayan sa Bulacan for Malnutrition Reduction Program (BREAK4 MRP)	September 22, 2022	FB Live
Dietary Assessment Training for HKI Personnel In Focus on 24-Hour Food Recall	September 28-29, 2022	Bayview Park Hotel Manila
Occupational Health and Safety Webinar	September 29, 2022	Zoom
FIRSt Virtual Space: Avoiding Pitfalls in Writing RRL	September 30, 2022	via Zoom
MRP Project 2 Virtual Feedback Conference	October 11, 2022	Zoom
Orientation on DOST-FNRI Mental Health Program	October 18, 2022	Zoom
ISO 9001:2015 Internal Auditor's Training	October 26, 2022	Zoom
Policy Dialogue: State of Fish Intake in Nutrition System	Oct. 25, 2022	B Hotel, Quezon City
ENNS 101	November 3, 2022	DOST-FNRI
Utility of DXA in Research and Clinical Practice	November 3, 2022	via zoom
ISO 29993:2017 Documentation & Implementation Training	November 8-9, 2022	via zoom
Mock Presentation of National Nutrition Summit	November 10, 2022	DOST-FNRI Auditorium
National Nutrition Summit	November 14, 2022	Dusit Thani FB Live (watched online)
F&N Talks Episode 4: NNS/ENNS 101	November 14, 2022	FB Live



Training on Functional Capacity Assessment	November 15, 2022	Zoom
Documents Control ISO 9001-2015 QMS	November 15	Zoom
Dissemination Forum: Drivers of Maternal Anemia Reduction among WRA: The Philippines Case Study	November 17, 2022	The Manila Hotel, Rizal Park, Manila City
F&N Talks Episode 4: NNS/ENNS 101 webinar	November 23, 2022	Zoom
Webinar on Work-Relatedness of Diseases	November 25, 2022	Zoom
FIRST Virtual Space: Spotting Credible Sources in the Digital Environment	December 7, 2022	Zoom
Echo-Webinar on Research Ethics	December 9, 2022	Zoom
Communicating the Science Behind Numbers with a Sexy Twist	December 13 – 15, 2022	The Acacia Hotel

# SCIENTIFIC LINKAGES AND INTERNATIONAL COOPERATION



16

**Scientific Linkages  
and International Cooperation**



34

**Scientific Linkages  
and Local Cooperation**

## INTERNATIONAL

Institution/Agency	Project
International Atomic Energy Agency	CRP E43033: Changes in Body Composition and its Effect on Childhood Cancer Survival Rates Among Newly Diagnosed Acute Lymphoblastic Leukemia Patients
International Atomic Energy Agency	Body Composition and Energy Expenditure of Filipino Infants and Young Children Using Stable Isotope Techniques (RAS7092 TC Project, Using Stable Isotope Techniques to Monitor Situations and Interventions for Promoting Infant and Young Child Nutrition – Phase II)
Mahidol University, Thailand	Determination of Energy Expenditure of Infants and Young Children (6–24 mos. Old) in Asia using the Doubly-Labelled Water Technique
National Institute of Nutrition, Vietnam	Determination of Energy Expenditure of Infants and Young Children (6–24 mos. Old) in Asia using the Doubly-Labelled Water Technique
University of Ruhuna, Sri Lanka	Determination of Energy Expenditure of Infants and Young Children (6–24 mos. Old) in Asia using the Doubly-Labelled Water Technique
Pakistan Institute of Nuclear Science and Technology, Pakistan	Determination of Energy Expenditure of Infants and Young Children (6–24 mos. Old) in Asia using the Doubly-Labelled Water Technique
Newcastle University, United Kingdom	Development and potential reversal of type 2 diabetes: How critical is vitamin A in the regulation of insulin responsiveness and lipid homeostasis?
Monash University, Malaysia	Development and potential reversal of type 2 diabetes: How critical is vitamin A in the regulation of insulin responsiveness and lipid homeostasis?
Wageningen University and Research	NutriMetabolomics Investigation of Malnutrition in the Philippines: Phase I
ASEAN Committee on Science, Technology, and Innovation (COSTI)	Country delegates in the Sub-Committee on Food Science and Technology (SCFST)

Nestec Ltd.	Statistical Analysis of the Glycemic Load, Protein and Carbohydrates Intake of Infants
Nestec Ltd.	Nutritional Supplementation In Children Aged 1-3 Years Old Experiencing Growth Concerns: A Perspective, Single-Arm, Open-Label, Interventional Study
Cereal Partners Worldwide, Switzerland	Breakfast in the Philippines: Food patterns and Nutritional Profile Results from the 2018 Expanded National Nutrition Survey
Ajinomoto Co., Inc. Japan	The Relationship of Dietary factors and protein adequacy to growth of Filipino school-aged children
Sick Kids Canada	Drivers of Anemia Reduction Among Women of Reproductive Age: The Philippine Case Study
Abbott Nutrition Singapore	Nutrition Adequacy in Filipino Children and Nutritional Factors Associated with Stunting: Analysis of Data From the 2019 National Nutrition Survey

## LOCAL

Institution/Agency	Project
DOST Regional Offices (Regions CAR, II, III, IV-B, VII, VIII, IX, X, XI, XII, and XIII); DOST Provincial Science and Technology Centers of Apayao, Isabela, Bulacan, Marinduque, Cebu, Biliran, Zamboanga del Sur, Zamboanga Sibugay, Misamis Oriental, Bukidnon, Davao del Norte, Sultan Kudarat, Surigao del Norte, Dinagat Islands, and Agusan del Sur; LGUs of Aklan [Province, Batan & Malinao], Surigao del Norte [Claver & Alegria], Misamis Oriental [Binuangan & Opol], South Cotabato [Province, T'boli & Lake Sebu], Cebu [Province, Consolacion & Cordova], Biliran [Province, Biliran & Cabucgayan], Sultan Kudarat [Lambayong & Bagumbayan], Bohol [Buenavista & Getafe], Marinduque [Province, Boac & Torrijos], Dinagat Islands [Basilisa & San Jose], Aurora [Province, Casiguran & Maria Aurora], Apayao [Province, Conner & Calanasan], Bukidnon [Province, Talakag & San Fernando], Zamboanga Sibugay [Siay & Imelda], Abra [Lagayan & Pennarubia], Zamboanga del Sur [San Miguel & Sominot], Agusan del Sur [Loreto & La Paz], Bulacan [San Miguel & Bocaue], Davao del Norte [Prov, Talaingod & Sn Isidro], Isabela [Prov, Benito Soliven & R. Mercedes]	Accelerated Nutrition Advocacy for Kids (ANAK): A Model Delivery System for Complementary Feeding and Nutrition Education in the Countryside





DOST-PCHRD; DOST Regional Offices (Region I, II, III, IV-A, IV-B, V, VI, VII, VIII, IX, X, XI, XII, ARMM, CAR); DOST Provincial S&T Offices (Sarangani, Lanao del Norte, Ifugao, Catanduanes, Zamboanga del Norte, Romblon, Sulu, Tawi-tawi, La Union, Bulacan, Misamis Oriental, Quezon, Pangasinan, Davao del Norte, Eastern Samar, Palawan, Antique, Leyte, Maguindanao)	Malnutrition Reduction Program: Moving Forward Towards Sustained Implementation: Project 2: Monitoring and Evaluation of the MRP- DOST PINOY
University of the Philippines	In Vitro Mineral Availability from Different Corn Varieties and Products
National Nutrition Council	Development and Field Testing of the Philippine Nutrient Profile Model
DOST-Philippine Nuclear Research Institute	Body Composition and Energy Expenditure of Filipino Older Infants and Young Children Using Stable Isotope Techniques
DOST-Philippine Council for Health Research and Development	OPTIDIETS: Optimization of Low-cost, Nutritionally Adequate Diets for Filipinos using a Web-based Analysis Tool
DOST-Special Projects Division	OPTIDIETS: Optimization of Low-cost, Nutritionally Adequate Diets for Filipinos using a Web-based Analysis Tool
DOST-Philippine Council for Health Research and Development	The Effects of Dietary Fiber and Other Non-Digestible Carbohydrates in a Pre-identified Low Glycemic Index
University of the Philippines Manila - Philippine General Hospital	Changes in Body Composition and its Effect on Childhood Cancer Survival Rates Among Newly Diagnosed Acute Lymphoblastic Leukemia Patients
University of the Philippines Manila - Philippine General Hospital	Development and potential reversal of type 2 diabetes: How critical is vitamin A in the regulation of insulin responsiveness and lipid homeostasis?



San Juan De Dios Hospital	Development and potential reversal of type 2 diabetes: How critical is vitamin A in the regulation of insulin responsiveness and lipid homeostasis?
Department of Agriculture – Bureau of Agriculture and Fisheries Standards (DA-BAFS)	Technical Working Group (TWG) for the Development of Risk Profile of Lead in Rice
DA-BAFS	Technical Working Group (TWG) for the Development of Risk Profile of Aflatoxin in Rice
DA-BAFS	Technical Working Group (TWG) for the Philippine National Standard for Sweet Corn
DA-BAFS	Technical Working Group (TWG) for the Explanatory Manual for PNS/BAFS 42:2019 Organic milled rice – Code of Practice – Postproduction
DA-BAFS	Technical Working Group (TWG) for the Development of Illustrative Guides for PNS of Corn Grits
DA-BAFS	Technical Working Group (TWG) for the Development of Illustrative Guides for PNS of Shelled Corn
Philippine Coconut Authority	TWG for the Standardization of Coconut Water Beverage



DA-BAFS	TWG for the Development of the Philippine National Standards (PNS) for Maximum Residue Limits (MRLs) of Pesticides on Cabbage, Cassava, and Corn
DA-BAFS	TWG for the Development of Explanatory Manual on PNS COHP for Tomato
Department of Science and Technology - Office of the Undersecretary for R&D	DOST Integrated Food Safety Program (IFSP)  TWG members for sub-components on: R&D, HRDP  TWG Chair for subcomponent on S&T Services
DA-BAFS	TWG for the Amendment of PNS for Fresh Vegetables: Sweet Corn
DA-BAFS	TWG for the Development of Illustrative Guide (IG) for PNS related to Corn
DTI-PAB	Technical Committee Chairman for Proficiency Testing (ISO/IEC 17043)
DTI-PAB	Technical Assessor for ISO 17025 on Chemical Parameters





DOST-ITDI	TWG Member for the Development of Draft Standards and Recommended Code of Practice for Processing of Peanut Butter
DTI-PAB	Laboratory Accreditation Technical Committee Member
DA-BSWM	Technical Advisory Group Member of Philippine National Soil Laboratory Network Proficiency Testing Scheme
Philippine Health Research Ethics Board (PHREB)	Sustainability of FIERC Operation and Accreditation: Upholding the Rights, Welfare and Well-being of Human Participants in DOST-FNRI Researches
Philippine Health Research Ethics Network (PHREN)	Sustainability of FIERC Operation and Accreditation: Upholding the Rights, Welfare and Well-being of Human Participants in DOST-FNRI Researches
University of the Philippines – Manila, National Institute for Health (UP-NIH)	Sustainability of FIERC Operation and Accreditation: Upholding the Rights, Welfare and Well-being of Human Participants in DOST-FNRI Researches
National University	Intensifying the Management Information System at DOST-FNRI
Philippine Communications Operation Office	eFOI and Data Privacy
Department of Science and Technology – Science Education Institute	Science Education Institute-Career Incentive Program Scholars



## SCIENTIFIC PAPERS PUBLISHED



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Scientific Papers Published

Title	Authors	Contact Details	Journal	Date Published
Monitoring the implementation of nutrition intervention at the local level	Rowena V. Viajar, Julieta B. Dorado, Emily O. Rongavilla, Georgina S. Caraig, and Joanne Jette S. Gulay	wenavelasco@yahoo.com	Evaluation and Program Planning Journal	January 2022
Determinants of normal nutrition among 0-59-month-old Filipino children living in low-income households	Ma. Anna Rita M. Ramirez and Apple Joy D. Ducay		Nutrition and Health	February 23, 2022
Impacts of COVID-19 Pandemic on Household Food Security and Access to Social Protection Programs in the Philippines: Findings From a Telephone Rapid Nutrition Assessment Survey	Dr. Imelda Angeles-Agdeppa, Charina A. Javier and Ma. Lynell V. Maniego		Food and Nutrition Bulletin	February 24, 2022
Dietary risk factors of physical growth of Filipino school-aged children	Dr. Imelda Angeles-Agdeppa, Taro Nakamura, Mayu Sugita, Marvin B. Toledo, Pamela S. Sampaga and Jezreel Ann T. Zamora		Food and Nutrition Research	March 09, 2022
Do school-based nutrition interventions improve the eating behavior of school-age children?	Nesrianne G. Buyco, Julieta B. Dorado, Glenda P. Azaña, Rowena V. Viajar, Divorah V. Aguila, and Dr. Mario V. Capanzana	nesgbuyco@gmail.com	Nutrition Research and Practice	Online: September 2021  Completed full-text publication: April 2022

Provision of chemical proficiency testing round on corn-based snack food for laboratories in the Asia-Pacific	Jolly C. Cotara, Leah C. Dajay, Melissa O. Guerra, Mylene B. Martin, Jennifer C. Laurea, Prudencio E. Adona Jr., and Maricar Giel Y. Parcarey	jolly.climaco@gmail.com	Accreditation and Quality Assurance	April 29, 2022
The Philippines' snapshot situation of pregnancy-related and child feeding practices during the COVID-19 pandemic	Dr. Imelda Angeles-Agdeppa, Dr. Eva A. Goyena and Ma. Lynell V. Maniego		Nutrition and Health Journal – SAGE Journal	May 22, 2022
Filipino Children with High Usual Vitamin A Intakes and Exposure to Multiple Sources of Vitamin A Have Elevated Total Body Stores of Vitamin A but Do Not Show Clear Evidence of Vitamin A Toxicity	Reina Engle-Stone, Jody C. Miller, Maria Fatima Dolly Reario, Charles D. Arnold, Ame Stormer, Eleanore Lafuente, Anthony Oxley, Mario V. Capanzana, Carl Vincent D. Cabanilla, Jennifer Lynn Ford, Adam Clark, Thirumalaisamy P. Velavan, Kenneth H. Brown, Georg Lietz, and Marjorie J. Haskell		Current Developments in Nutrition doi: 10.1093/cdn/nzac115	July 25, 2022
Determinants of Overweight/Obesity among Filipino Adolescents: 2018 Expanded National Nutrition Survey	Josie P. Desnacido, Ma. Lilibeth P. Dasco, Apple Joy D. Ducay, Charmaine A. Duante and Dr. Imelda Angeles-Agdeppa		Philippine Journal of Science	August 4, 2022
Breakfast in the Philippines: food and diet quality as analyzed from the 2018 Expanded National Nutrition Survey	Dr. Imelda Angeles-Agdeppa, Ma. Rosel S. Custodio and Marvin B. Toledo		Nutrition Journal	August 12, 2022
The Effects of Coconut Skim Milk and Coco-Dairy Milk Blend on the Nutritional Status of Schoolchildren	Dr. Imelda Angeles-Agdeppa and Jezreel Ann T. Zamora		Journal of Nutrition and Metabolism	September 19, 2022





Nutritional and genetic determinants of essential hypertension among adult respondents of the 2013 national nutrition survey, Philippines: a preliminary observational study	MPPZumaraga, MPRodriguez, AYCaman, CDTDeguit, JHBiwang, JBMelegrito, CADuante, MLMadrid, MARConcepcion, JBNevado	The Journal of Nutritional Biochemistry, Volume 110, 2022, 109152, ISSN 0955-2863	September 20, 2022
Drivers and Barriers of Whole Grain Consumption in the Philippines: 2019 Expanded National Nutrition Survey	Dr. Imelda Angeles-Agdeppa, Josie P. Desnacido, Apple Joy D. Ducay, Charmaine A. Duante and Kit Phanvijhitsiri	Philippine Journal of Science	October 5, 2022
Analysis of food sources and nutrient intakes of selected breastfeeding mothers in Metro Manila, Philippines	Dr. Imelda Angeles-Agdeppa, Josie P. Desnacido and Apple Joy D. Ducay	World Nutrition Journal	October 31, 2022
Adherence to age-appropriate feeding practices among Filipino children under two: An analysis of the 2018- 2019 Expanded National Nutrition Survey	Eva A. Goyena, Ph.D. and Ma. Lynell V. Maniego	Malaysian Journal of Nutrition	December 2022
BMI differences in access to and use of health information technology: Secondary Analysis of the Health	Eva A. Goyena, Ph.D	Malaysian Journal of Nutrition	December 22, 2022
Government-Industry-Academia Alliance: A Multi-sectoral collaboration for improved nutrition of children and well-being of mothers		Malaysian Journal of Nutrition	

## JOURNAL CITATIONS

Title	Authors	Cited in
Do school-based nutrition interventions improve the eating behavior of school-age children?	Nesrienne G. Buyco, Julieta B. Dorado, Glenda P. Azaña. Rowena V. Viajar, Divorah V. Aguila, Mario V. Capanzana	<p>Rozenský, Ladislav &amp; Líba, Jan &amp; Ondrušák, Petr &amp; Dolista, Josef &amp; Rozenský, Miles. (2022). Neuropsychology and Its Transfer To Other Sciences – Conference paper. 10.33544/q2022.12.</p> <p>Gužíková, Libuša. (2022). Sociálno-ekonomické zmeny súčasnej rodiny a ich vplyv na deti. 10.33543/q2022.12.</p>
Efficacy of Malunggay (Moringa oleifera) leaves in improving the iron and vitamins A and B status of Filipino schoolchildren	ME Serafico, LA Perlas, CR Magsadia, JA Desnacido, RV Viajar, EO Rongavilla, GP Azana, TP Trinidad	<p>Sumeer Brar, Carolyn Haugh, Nicole Robertson, Patrick Mbullo Owuor, Carrie Waterman, George J. Fuchs III, Suzanna Labib Attia. The impact of Moringa oleifera leaf supplementation on human and animal nutrition, growth, and milk production: A systematic review. Phytotherapy Research Journal. First published: 18 March 2022.</p> <p><a href="https://doi.org/10.1002/ptr.7415">https://doi.org/10.1002/ptr.7415</a></p>



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Assessing school-lunch feeding and nutrition education strategy for healthier kids in selected Philippine public schools

Julieta B. Dorado, Glenda P. Azaña, Rowena V. Viajar, Ma. Anna Rita M. Ramirez, Eldridge B. Ferrer, Nesrianne G. Buyco, Divorah V. Aguila, Mario V. Capanzana

ZAKKOUR, Hazal & YILDIRAN, Hilal. (2022). EBEVEYN BESLENME EĞİTİMİNİN OKUL ÇAĞI ÇOCUKLARINDA VERİLEN BESLENME EĞİTİMİNE ETKİSİ THE EFFECT OF PARENT'S NUTRITION EDUCATION ON NUTRITION EDUCATION OF SCHOOL-AGE CHILDREN. Gazi Sağlık Bilimleri Dergisi. 10.52881/gsbdergi.1140710. Year 2022, Volume 7, Issue 3, 135 – 148, 23.12.2022

Guzik, Elena. (2022). School Feeding in the Republic of Belarus. ЗДОРОВЬЕ НАСЕЛЕНИЯ И СРЕДА ОБИТАНИЯ - ЗНнСО / PUBLIC HEALTH AND LIFE ENVIRONMENT. 92-100. 10.35627/2219-5238/2022-30-10-92-100.

Inácio, Monique & Pereira, Fernanda & Fernandes, Lidiane & Oliveira, Izabela & Corrêa Pereira, Rafaela & Angelis-Pereira, Michel. (2022). Food and Nutrition Education Using Intuitive Method and NOVA Food Classification: Implications for Food Practices of Children and Adolescents Intuitive Method in Food and Nutrition Education. American Journal of Health Promotion. 36. 089011712210923. 10.1177/08901171221092394. First published online April 14, 2022

Baloch, Fozia & Mohamed Ismail, Shaik Abdul Malik & Jomezai, Nazir. (2021). Principals' intentions and anticipated challenges in implementing nutrition education. Health Education. ahead-of-print. 10.1108/HE-04-2021-0059.

Е. О. Гузик. Организация школьного питания в Республике Беларусь  
Главная > № 10 (2022)  
<https://doi.org/0000-0003-2173-396X>

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Process Evaluation of Nutrition Intervention Strategy in a Local Philippine Setting

Rowena V Viajar, Julieta B Dorado, Glenda P Azaña, Heidenhein A Ibarra, Eldridge B Ferrer, Mario V Capanzana

Nasrullah Nasrullah, Syahrul Syahrul, Kusrini Kadar. Evaluasi Pengaruh Complementary Feeding terhadap Status Nutrisi Anak: Literature Review. Jurnal Keperawatan. Vol. 14 No. 2 (2022): Jurnal Keperawatan: Juni 2022



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Operationalizing local children nutrition surveillance system: The Philippines' Operation Timbang revisited, the case of Abra de Ilog

Ma Anna Rita Marfil Ramirez,  
Rowena V Viajar, Glenda P  
Azaña

Jessielyn S. Pantalone,  
Normahitta P. Gordoncillo,  
Leila S. Africa, Corazon VC.  
Barba, Josefina T. Dizon,  
Jaidee Pagne & Kristine V.  
Montecillo. Stunting and  
zinc deficiency among  
3-5 years old Kankana-  
ey children in Kibungan,  
Benguet, Philippines. *Mal J  
Nutr* 28(3): 305-314, 2022  
doi: [https://doi.org/10.31246/  
mjn-2021-0114](https://doi.org/10.31246/mjn-2021-0114)

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Field testing of complementary feeding and nutrition education intervention in selected Philippine villages

Julieta B Dorado, Clarita R  
Magsadia, Rowena V Viajar,  
Chona F Patalen, Glenda P  
Azana, Mario V Capanzana

Rowena V.Viajar, Julieta  
B.Dorado, Emily O.Rongavilla,  
Georgina S.Caraig, Joanne  
Jette S.Gulay. Monitoring  
the implementation of  
nutrition intervention at the  
local level. *Evaluation and  
Program Planning Journal*.  
Volume 91, April 2022, 102047.  
[https://doi.org/10.1016/j.  
evalprogplan.2022.102047](https://doi.org/10.1016/j.evalprogplan.2022.102047)

# SCIENTIFIC PAPER PRESENTED



21

Scientific Papers Presented

## INTERNATIONAL

Title of Paper	Author/Presenter	Place/Venue/ Conference	Date Presented
Virgin Coconut Oil is Effective in Lowering C-reactive Protein Levels among Suspect and Probable Cases of COVID-19	Dr. Imelda Angeles-Agdeppa	The 8th Asian Congress of Dietetics	August 19, 2022
Dietary Risk Factors of Physical Growth of Filipino School-Aged Children	Dr. Imelda Angeles-Agdeppa	The 8th Asian Congress of Dietetics	August 20, 2022
A strategy towards nutritious eating in the post-pandemic: Development of recipes and tools for healthier families in the now normal	Eirene Agustin Arnejo May Ann D. Gironella	10th Seoul International Congress of Endocrinology and Metabolism in conjunction with the 41st Annual Scientific Meeting of Korean Endocrine Society (SICEM 2022)  Scientific congress and Poster Exhibit	October 27 – 29, 2022
The Prevalence and Associated Risk Factors of Impaired and High Fasting Blood Glucose among Filipino Adults	Chona . Patalen Maria Stephanie Parani Frances Pola Arias	Kidaejung Convention Center, Gwangju, South Korea (Online)  SICEM 2022 (10th Seoul International Congress of Endocrinology and Metabolism)	Oct. 27-29, 2022
A Study of breakfast patterns in Indonesia, Malaysia and Philippines	Dr. Imelda Angeles-Agdeppa	22nd IUNS-International Congress of Nutrition	December 7, 2022

Inadequate nutrient intakes in Filipino schoolchildren and adolescents are common among those from rural areas and poor families	Dr. Imelda Angeles-Agdeppa	22nd IUNS-International Congress of Nutrition	December 10, 2022
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## LOCAL

Title of Paper	Author/Presenter	Place/Venue/Conference	Date Presented
From Mind to Heart: Strategies for Addressing Risk Factors for Non-Communicable Diseases in the Now Normal	Chona F. Patalen	UP College of Public Health and British Embassy Manila Webinar Series for Public Health Workers	February 7, 2022
The Philippine Nutrient Profile Model	ME Serafico, CVDCabanilla, DVAguila, KBNacionales, RCATan, ACTorres, MVCapanzana  Presenter: ME Serafico	Zoom / World Obesity Day Webinar	March 4, 2022
Genes, couch, or behavior: a balancing act towards healthier weight	JSNacis, MAUdarbe, RCATan, NLCSantos, DKCMendoza, PAGEspañola  Presenter: JSNacis	The Manila Hotel, Manila/48th FNRI Seminar Series	July 7, 2022
2022 DOST-FNRI Menu Guide Calendar: Nutritious Meals for Healthier Families in the Now Normal  (Poster Exhibit)	May Ann D. Gironella, Idelia G. Glorioso, Eirene Agustin B. Arnejo, Veronica Vianca C. Salazar, Shannen Faye Q. Arevalo, Erika Niña C. Bacolod, Mark Gerald J. Ba-ay, Marietta M. Bumanglag, Christelle Lois T. Bayalas, Ma. Corazon E. Palompo, Eva L. Rebato and Milflor S. Gonzales, Ph.D.	The Manila Hotel, Manila/48th FNRI Seminar Series	July 7 – 8, 2022





Determinants of Underweight and Stunting among 0–59 Months Old Children of Indigenous People’s Households: 2018 Expanded National Nutrition Survey	Rowena V. Viajar	The Manila Hotel, Manila/48th FNRI Seminar Series	July 8, 2022
Nutritional Status, Dietary Intake and Care Practices Of 6 Months To 5 Years Old Children in Households With Temporary Migrant Workers	Joanne Jette S.Gulay	The Manila Hotel, Manila/48th FNRI Seminar Series	July 8, 2022
Lipote Fruit ( <i>Syzgium polycephaloides</i> (C.B.Rob)) Anthocyanin-rich Extracts as Potential Natural Food Colorants: Extraction Optimization and Stability Evaluation	Regina G. Rodriguez-Tanaka, Rosario S. Sagum, Ph.D., and Trinidad P. Trinidad, Ph.D.	The Manila Hotel, Manila/48th FNRI Seminar Series	July 8, 2022
Upgrade Food Inspections, Level up Food Safety: Modernization through the DOST-FNRI Food Safety Grading System Tools	Marietta M. Bumanglag, Claire S. Malibiran, May Ann D. Gironella, Eirene Agustin B. Arnejo, Kelvin Andrew D. Kua, Elaine R. Prades, Jalyssa Camil G. Samonte, and Glen Melvin P. Gironella  Presenter: Claire M. Gacias	The Manila Hotel, Manila/48th FNRI Seminar Series	July 8, 2022
“Nutrition Situation of the Country in the Context of Covid-19 Pandemic”	Dr. Eva A. Goyena	NNC – Calabarzon Quezon City  Calabarzon Thematic Conference on Nutrition Month and Breastfeeding Awareness Month”	31 August 2022 via Zoom

ENNS 2018–2019: Food Consumption Pattern of Filipino Households		Somerset Hotel, Makati City  Workshop on Updating and Development of New Bundles for the Estimation of Food and Poverty Threshold	Sept 6–7, 2022
Legal and Institutional Assessment on Sodium Reduction Measures in the Philippines		Ramada Hotel, 9:00 to 1:00PM on	September 12, 2022
Intake and Plate Waste Pattern of Filipino Households: 2018–2019 Expanded National Nutrition Survey	Dr. Eva A. Goyena, Josie P. Desnacido, and Dr. Imelda Angeles-Agdeppa	Waste No More 2022 Conference @ Philippine Training and Trade Center, Pasay City	December 1, 2022
DOST-FNRI Initiatives on Policy Translation of Research Results	Dr. Marie T. Bugas	Project Results to Policy Recommendations (PR to PR): The Link Virtual Provincial Policy Forum in Mt. Province	December 2, 2022
DOST-FNRI Initiatives on Policy Translation of Research Results	Dr. Marie T. Bugas	Project Results to Policy Recommendations (PR to PR): The Link Virtual Provincial Policy Forum in the Province of Samar	December 7, 2022
DOST-FNRI Initiatives on Policy Translation of Research Results	Dr. Marie T. Bugas	Project Results to Policy Recommendations (PR to PR): The Link Virtual Provincial Policy Forum in the Province of Davao Occidental	December 13, 2022



# POSTER PRESENTATION



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Posters Presented

## INTERNATIONAL

Title of Paper	Author/Presenter	Place/Venue/ Conference	Date Presented
Screening Dietary Exposure Assessment of Filipinos to Saturated and Trans Fat from Commonly-Consumed Foods	Elyss G. Billedo	10th Seoul International Congress of Endocrinology and Metabolism (SICEM 2022)	October 27-29, 2022
Serum undercarboxylated osteocalcin levels in stunted and non-stunted Filipino children and the association with growth	Ma. Lynell V. Maniego	22nd IUNS-International Congress of Nutrition Tokyo, Japan	Nov. 25, 2022

## LOCAL

Title of Paper	Author/Presenter	Place/Venue/ Conference	Date Presented
A plus in the BMI is maybe all in the mind	JSNacis, MAUdarbe, RCATan, NLCSantos, DKCMendoza, PAGEspañola	The Manila Hotel, Manila/48th FNRI Seminar Series	July 7-8, 2022
Enhancement of the PhIFCT Online Database and Mobile Application	Kristine B. Nacionales, Regina G. Rodriguez-Tanaka, Alexandra Lyne E. David, Ma. Ariza C. Baylosis, Aries G. Lundag	The Manila Hotel, Manila/48th FNRI Seminar Series	July 7 and 8, 2022
Lipote Fruit (Syzigium polycephaloides (C.B.Rob)) Anthocyanin-rich Extracts as Potential Natural Food Colorants: Extraction Optimization and Stability Evaluation	Regina G. Rodriguez-Tanaka, Rosario S. Sagum, Ph.D., and Trinidad P. Trinidad, Ph.D.+	The Manila Hotel, Manila/48th FNRI Seminar Series	July 7 and 8, 2022



Proficiency Assessment of Some Philippine Food Testing Laboratories for Proximate and Mineral Analyses and FNRI-Sensory Evaluation Laboratory for Sweetness Ranking Test	Leah C. Dajay, Jolly C. Cotara, Melissa O. Guerra, Mylene B. Martin, Jennifer C. Laurea, Maricar Giel Y. Parcarey, Prudencio E. Adona Jr.	The Manila Hotel, Manila/48th FNRI Seminar Series	July 7 and 8, 2022
Determinants of Underweight and Stunting among 0-59 Months Old Children of Indigenous People's Households: 2018 Expanded National Nutrition Survey	Rowena V. Viajar, Julieta B. Dorado, Ma. Lynell V. Maniego, Joanne Jette S. Gulay, Patricia Isabel G. Amita and Imelda Angeles-Agdeppa, Ph.D.	The Manila Hotel, Manila/48th FNRI Seminar Series	July 8, 2022
Nutritional Status, Dietary Intake and Care Practices Of 6 Months To 5 Years Old Children in Households With Temporary Migrant Workers	Julieta B. Dorado, Emily O. Rongavilla, Joanne Jette S. Gulay, Rowena V. Viajar, Georgina S. Caraig	The Manila Hotel, Manila/48th FNRI Seminar Series	July 8, 2022



## TECHNICAL TRAININGS



40

### Technology Transfer Trainings

#### TECHNOLOGY TRANSFER AND COMMERCIALIZATION TRAINING ON THE PRODUCTION OF FNRI-DEVELOPED FOOD TECHNOLOGIES

Title of Training/Technology	Venue	Number of Participants	Inclusive Dates Conducted	Funding Source
Technology Transfer Training on the Production of Enhanced Nutribun Squash and Carrot Variant for Apayao State College	Virtual training via Zoom	1 Licensee	February 16-18, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Rice-Mongo Curls and Rice-Mongo Instant Blend	Onsite training at Ifugao State College	1 licensee	February 21-24, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer Training on the Production of Rice-Mongo Curls and Rice-Mongo Instant Blend	Onsite training at Sulu State College	1 licensee	February 28 - March 4, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer training for the production of Rice-Mongo-Sesame Blend for Waffletime Inc.	Virtual training via Zoom	1 licensee	March 15-16, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Enhanced Nutribun Squash Variant Batch 15	Virtual training via Zoom	10 licensees	March 23-25, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Enhanced Nutribun Carrot Variant Batch 6	Virtual training via Zoom	10 Licensees	March 27-28, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Rice-Mongo Curls and Rice-Mongo Instant Blend	Onsite training at LGU Odiongan, Romblon	1 licensee	March 28 to April 1, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA

Technology Transfer Training for the production of Iron Fortified Rice at Cervantes Rice Millers Association	Onsite training at Cervantes Rice Millers Association	1 licensee	April 5, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training for the production of Iron Fortified Rice at Metro Bugnay Cooperative	Onsite training at Metro Bugnay Cooperative	1 licensee	April 6, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training for the Production of Enhanced Nutribun Sweet Potato Variants, Batch 1- Region 1 & 2	Virtual training via Zoom	15 Licensees	April 5-6, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Rice-Mongo Curls and Rice-Mongo Instant Blend	Onsite training at LGU Catarman, Northern Samar	1 Licensee	April 8-11, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer Training on the Production of Rice-Mongo Curls and Rice-Mongo Instant Blend	Onsite training at LGU Alabel, Sarangani	1 Licensee	April 18-22, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer Training for Enhanced Nutribun Sweet Potato Variants, Batch 2- Region 3, CAR & NCR	Virtual training via Zoom	17 Licensees	April 19-20, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training for Enhanced Nutribun Sweet Potato Variants, Batch 3- CALABARZON	Virtual training via Zoom	16 Licensees	April 25-26, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training for Enhanced Nutribun Sweet Potato Variants, Batch 4- CALABARZON and Region 10	Virtual training via Zoom	10 Licensees	May 4-5, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training for Enhanced Nutribun Sweet Potato Variants, Batch 5 – Region 4B, 6, & 7	Virtual training via Zoom	12 Licensees	May 10-11, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Rice-Mongo Curls and Rice-Mongo Instant Blend	Onsite training at LGU Guiguinto, Bulacan	1 Licensee	May 11-13, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA





Technology Transfer Training for the production of Enhanced Nutribun Sweet Potato Variants, Batch 6 – Region 6, 8, 9 & 11	Virtual training via Zoom	10 Licensees	May 17-18, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training for the production of Enhanced Nutribun Sweet Potato Variants, Batch 7 – Region 8, 9, 10, 11, & 12	Virtual training via Zoom	13 Licensees	May 24-25, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training for the production of Micro- Nutrient Growth Mic 15 (MGM 15) at Nutridense Food Manufacturing Corporation	Onsite training at Nutridense Food Manufacturing Corporation	1 licensee	May 4, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training for the production of multi-nutrient extruded rice kernel for women of reproductive age (MNERK for WRA) at Nutridense Food Manufacturing Corporation	Onsite training at Nutridense Food Manufacturing Corporation	1 licensee	May 5, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer training for the production of Rice- Mongo-Sesame Blend and Rice-Mongo Instant Blend at Action Hubs Philippines Inc.	Onsite training at Action Hubs Philippines Inc.	1 licensee	May 23-25, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training on the Production of Rice- Mongo Curls and Rice- Mongo Instant Blend	Onsite training at Catanduanes State University – Panganiban Campus	1 licensee	May 30 to June 3, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer training for the production of Tubig Talino at Samahang Mandaragat ng Banilad (SAMBA) Incorporated	Onsite training at Samahang Mandaragat ng Banilad (SAMBA) Incorporated	1 licensee	June 15-17, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer training for the production of Rice- Mongo-Sesame Blend and Rice-Mongo Crunchies at Cebu Technological University –Daanbantayan	Onsite training at Cebu Technological University –Daanbantayan Campus	1 licensee	June 21-24, 2022	DOST-FNRI Tech Transfer GF and MRP Project 1

Technology Transfer training for the production of Iron Fortified Rice at Esteems Industries	Onsite training at Esteems Industries	1 licensee	July 12-13, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer training for the production of Tubig Talino at Buhay Autismo Incorporated	Onsite training at Buhay Autismo Incorporated	1 licensee	July 15, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer training for the production of Rice-Mongo-Sesame Blend, Rice-Mongo Crunchies, Rice-Mongo Curls and Rice-Mongo Instant Blend	Onsite training at LGU San Mateo, Isabela	1 licensee	July 18-22, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer training for the production of Rice-Mongo Curls and Rice-Mongo Instant Blend	Onsite training at Davao del Norte State College	1 licensee	July 25-29, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer training for the production of Rice-Mongo Curls and Rice-Mongo Instant Blend	Onsite training at Central Bicol State University of Agriculture and LGU Oas, Albay	2 licensees	August 14-19, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer Training on the Production of Enhanced Nutribun Squash Variant Batch 16	Virtual training via Zoom	5 licensees	August 15-17, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer training for the production of Rice-Mongo-Sesame Blend	Onsite training at San Jose BNSA CFPF and LGU Bulalacao	2 licensees	August 22-26, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer training for the production of Rice-Mongo Curls, Rice-Mongo Crunchies, Rice-Mongo-Sesame Blend and Rice-Mongo Instant Blend	Onsite training at LGU Ozamiz	1 licensee	September 6-9, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA



Technology Transfer Re-training for the production of Rice-Mongo Curls, and Rice-Mongo Instant Blend	Onsite training at Ifugao State University	1 licensee	September 11-13, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer Training for the production of Enhanced Nutribun Sweet Potato Variants, Batch 8	Virtual training via Zoom	13 Licensees	September 21-22, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer training for the production of Rice-Mongo Curls, Rice-Mongo Crunchies, Rice-Mongo-Sesame Blend and Rice-Mongo Instant Blend	Onsite training at LGU Kidapawan	1 licensee	September 26-29, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer Training on the Production of Enhanced Nutribun Squash Variant Batch 17	Virtual training via Zoom	14 licensees	October 25-27, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Re-training for the production of Rice-Mongo Curls, and Rice-Mongo Instant Blend	Onsite training at PLGU Linamon CFPF	1 licensee	November 7-11, 2022	MRP Project 1: Roll-Out of Complementary Food Processing Facility (Batch 3) GIA
Technology Transfer Training for the production of Rice-Mongo Curls, Coco Blend, Coco Puff & Coco Bisc at Aretei Foods Corporation	Onsite training at Aretei Foods Corporation	1 licensee	November 14-16, 2022	DOST-FNRI Tech Transfer GF
Technology Transfer Training for the production of Coco Blend, Coco Puff & Coco Bisc at Nutridense Food Manufacturing Corporation	Onsite training at Nutridense Food Manufacturing Corporation	1 licensee	December 5-6, 2022	DOST-FNRI Tech Transfer GF



## TECHNICAL TRAININGS ON DOST-PINOY



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### DOST-PINOY Trainings

Title of Training	Venue	Number of Participants	Inclusive Dates Conducted	Funding Source
Virtual DOST PINOY Training on Modules	Loreto and La Paz, Agusan del Sur	118	January 19-28, 2022 (2 batches)	MRP DOST PINOY
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Maragondon, Cavite Via Zoom	25	February 14-15, 2022	DOST CALABARZON
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Virac, Catanduanes	40	April 1-2, 2022	MRP Project II
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	San Miguel, Catanduanes Via Zoom	33	April 18-19, 2022	MRP Project II
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Caramoran, Catanduanes	30	April 18-19, 2022	MRP Project II
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Pandan, Catanduanes Via Zoom	40	April 21-22, 2022	MRP Project II
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Caramoran, Catanduanes	35	April 21-22, 2022	MRP Project II
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Maitum, Sarangani	41	May 4 and 6, 2022	MRP Project II
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Municipal Hall, Tingloy, Batangas	16	May 18-19, 2022	DOST CALABARZON



DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Banaue, Ifugao Via Zoom	50	May 23-24, 2022	MRP Project II
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Catarman, Camiguin Via Zoom	33	June 6-7, 2022	DOST RO X
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Maasim, Sarangani	50	June 23-24, 2022	MRP Project II
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Bautista, Pangasinan	50	August 11- 12, 2022	MRP Project II
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Tabuk, Kalinga for LGU-Tanudan	54	August 17- 18, 2022	MRP Project II
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Glan, Sarangani	47	August 17- 18, 2022	MRP Project II
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Municipal Hall, Sto. Domingo, Ilocos Sur	35	August 31 - September 1, 2022	DOST RO I
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Libertad, Misamis Oriental Via Google Meet	43	September 20-21, 2022	LGU-Libertad/ DOST RO X
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Kinoguitan, Misamis Oriental Via Zoom	50	October 20-21, 2022	LGU-Kinoguitan. DOST RO X
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Linamon, Lanao del Norte	42	November 15-16, 2022	DOST PSTO Lanao del Norte
DOST PINOY (Package for the Improvement of Nutrition of Young Children)	Lamut, Ifugao Via Zoom	32	November 17-18, 2022	DOST PSTO Ifugao

# 2022 AWARDS



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## International Recognitions

### INTERNATIONAL RECOGNITIONS

Title of the Award	Awardee (Individual/Group)	Date	Venue
International Achievement Award – 3rd Placer, Oral Presentation in the 4th International Conference on Food and Nutrition	REPGuilaran	December 15, 2022	DOST-FNRI, Taguig City
International Achievement Award – 3rd Placer, Poster Presentation in the 4th International Conference on Food and Nutrition	EGBilledo	December 15, 2022	DOST-FNRI, Taguig City



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## Local Recognitions

### LOCAL RECOGNITIONS

Title of the Award	Awardee (Individual/Group)	Date	Venue
1st Place, Scientific Poster Competition	JSNacis, MAUdarbe, RCATan, NLCSantos, DKCMendoza, PAGEspanola	July 8, 2022	Manila Hotel, Manila
48th FNRI Seminar Series: “A Plus in the BMI is Maybe All in the Mind”			
2nd Place, Scientific Poster Award: 48th DOST-FNRI Seminar Series	Marietta M. Bumanglag, Claire S. Malibiran, May Ann D. Gironella, Eirene Agustin B. Arnejo, Kelvin Andrew D. Kua, Elaine R. Prades, Jalyssa Camil G. Samonte, and Glen Melvin P. Gironella	July 8, 2022	Manila Hotel, Manila
Upgrade Food Inspections, Level up Food Safety: Modernization through the DOST-FNRI Food Safety Grading System Tools			





Consolation Prize, Scientific Poster Award: 48th DOST-FNRI Seminar Series	May Ann D. Gironella, Idelia G. Glorioso, Eirene Agustin B. Arnejo, Veronica Vianca C. Salazar, Shannen Faye Q. Arevalo, Erika Niña C. Bacolod, Mark Gerald J. Ba-ay, Marietta M. Bumanglag, Christelle Lois T. Bayalas, Ma. Corazon E. Palompo, Eva L. Rebato and Milflor S. Gonzales, Ph.D.	July 8, 2022	Manila Hotel, Manila
2022 DOST-FNRI Menu Guide Calendar: Nutritious Meals for Healthier Families in the Now Normal			
2022 DOST Intellectual Property Awards: International Publication Awards (IPub) for the paper "Allele-specific differences of FTO and MC4R genes in the energy and nutrient intakes and eating behavior of Filipino adolescents in selected areas in Metro Manila, Philippines"	JSNacis, MAUdarbe, MJGGubat, EVJMagtibay, RELAgarrado, AQTongco, MCPTanada	November 23, 2022	World Trade Center, Pasay City
2022 DOST Intellectual Property Awards: International Publication Awards (IPub) for the paper "Right diet for the right person": A focus group study of nutritionist-dietitians' perspectives on nutritional genomics and gene-based nutrition advice"	JSNacis, MRGalang, JPHLabrador, MSGonzales, AMFDDablo, DGADRonquillo, VJFAlfonso, IGGlorioso, MPRodriguez	November 23, 2022	World Trade Center, Pasay City
2022 DOST Intellectual Property Awards: International Publication Awards (IPub) for the paper "Genotype effects on $\beta$ -Carotene conversion to Vitamin A: Implications on reducing Vitamin A deficiency in the Philippines"	MPPZumaraga, JMRAArquiza, MARConcepcion, LAPerlas, MNACatalma, MPRodriguez	November 23, 2022	World Trade Center, Pasay City

<p>2022 DOST Intellectual Property Awards: International Publication Awards (IPub) for the paper “Next generation sequencing of 502 lifestyle and nutrition related genetic polymorphisms reveals independent loci for low serum 25-hydroxyvitamin D levels among adult respondents of the 2013 Philippine National Nutrition Survey”</p>	<p>MPPZumaraga, MARConcepcion, CADuante, MPRodriguez</p>	<p>November 23, 2022</p>	<p>World Trade Center, Pasay City</p>
<p>Achievement Award</p> <p>2022 DOST Intellectual Property Awards</p> <p>International Publication Awards</p> <p>Monitoring the implementation of nutrition intervention at the local level</p> <p>Evaluation and Program Planning Journal</p>	<p>Rowena V. Viajar, Julieta B. Dorado, Emily O. Rongavilla, Georgina S. Caraig, Joanne Jette S. Gulay</p>	<p>November 23, 2022</p>	<p>World Trade Center By National Academy of Science and Technology (NAST)</p>
<p>Achievement Award</p> <p>2022 DOST Intellectual Property Awards</p> <p>International Publication Awards</p> <p>Do school-based nutrition interventions improve the eating behavior of school-age children?</p> <p>Nutrition Research and Practice Journal</p>	<p>Nesrianne G. Buyco, Julieta B. Dorado, Glenda P. Azaña, Rowena V. Viajar, Divorah V. Aguila, and Mario V. Capanzana</p>	<p>November 23, 2022</p>	<p>World Trade Center</p>



<p>Achievement Award</p> <p>2022 DOST Intellectual Property Awards</p> <p>International Publication Awards</p>	<p>Emily O. Rongavilla, Julieta B. Dorado, Georgina S. Caraig, Rowena V. Viajar, Glenda P. Azaña, Eldridge B. Ferrer, Dovie G. Domiquel, Jennilyn S. Ygaña, and Mario V. Capanzana</p>	<p>November 23, 2022</p>	<p>World Trade Center By National Academy of Science and Technology (NAST)</p>
<p>Science and technology intervention strategy on complementary feeding to improve the nutritional status of young children in two Yolanda disaster areas in the Philippines: Evidences from the grounds Philippine Journal of Science</p>			
<p>Inventors Award (Copyright): Revised Food Inspection Checklist</p>			
<p>Inventors Award (Copyright): Code of Standards for the Food Inspection Checklist and Grading System of Food Service Establishments</p>	<p>Marietta M. Bumanglag, Claire S. Malibiran, May Ann D. Gironella, Eirene Agustin B. Arnejo, Kelvin Andrew D. Kua, Elaine L. Prades, Jalyssa Camil G. Samonte, Glen Melvin P. Gironella</p>	<p>December 15, 2022</p>	<p>DOST-FNRI</p>
<p>Inventors Award (Copyright): Operations Manual for Risk-based inspection and Grading System of Food Service Establishments</p>			
<p>Inventors Award (Copyright): Food Safety Compliance Rating</p>			



Inventors Award (Copyright): 2022 Menu Guide Calendar: Nutritious Meals for Healthier Families in the Now Normal	May Ann D. Gironella Idelia G. Glorioso Eirene Agustin B. Arnejo Veronica Vianca C. Salazar Shannen Faye Q. Arevalo Eva L. Rebato Erika Niña C. Bacolod, Mark Gerald J. Ba-ay Milflor S. Gonzales Christelle Lois T. Bayalas Ma. Corazon E. Palompo Marietta M. Bumanglag	December 15, 2022	DOST-FNRI
Inventors Award (Copyright): eKusina - Munggo curry			
Inventors Award (Copyright): eKusina - Pork-tomato fried rice with veggies	May Ann D. Gironella, Idelia G. Glorioso, Erika Niña C. Bacolod, Eirene Agustin B. Arnejo, Shannen Faye Q. Arevalo, Veronica Vianca C. Salazar, Christelle Lois T. Bayalas, Mark Gerald J. Ba-ay, Eva L. Rebato & Milflor S. Gonzales, Ph.D.	December 15, 2022	DOST-FNRI
Inventors Award (Copyright): eKusina - Tokwa mechado			
Inventors Award (Copyright): eKusina - Shrimp-veggie okoy			
Scientific Technical Writer Awards	Julieta B. Dorado Emily O. Rongavilla Rowena V. Viajar Joanne Jette S. Gulay Nesrianne G. Buyco Georgina S. Caraig	December 15, 2022	Virtual during FNRI Thanksgiving
Scientific Technical Writer Award Impact of COVID-19 pandemic on Household Food Security and Access to Social Protection Programs in the Philippines: Finding from a Telephone Rapid Nutrition Assessment Survey	Imelda-Angeles Agdeppa, Ph.D Charina A. Javier Charmaine Duante Ma. Lynell Maniego	December 15, 2022	DOST-FNRI



Scientific Technical Writer Award The Philippines' snapshot situation of pregnancy- related and child feeding practices during the COVID-19 pandemic	Imelda Angeles-Agdeppa, Ph.D Eva A. Goyena, Ph.D Maria Stephanie N. Parani Ma. Lynell V. Maniego	December 15, 2022	DOST-FNRI
Scientific Technical Writer Award Impacts of COVID-19 in the participation of Filipino children 0-12 years old to nutrition- specific programs and their mothers' knowledge based on Rapid Nutrition Assessment Survey (RNAS)	Imelda Angeles-Agdeppa, Ph.D Eva A. Goyena, Ph.D Maria Stephanie N. Parani Ma. Lynell V. Maniego	December 15, 2022	DOST-FNRI
Scientific Technical Writer Award Drivers and Barriers of Whole Grain Consumption in the Philippines: 2019 Expanded National Nutrition Survey	Imelda Angeles-Agdeppa, Ph.D Josie Platon-Desnacido Apple Joy D. Ducay Charmaine A. Duante	December 15, 2022	DOST-FNRI
Scientific Technical Writer Award Determinants of Overweight/Obesity among Filipino Adolescents: 2018 Expanded National Nutrition Survey	Imelda Angeles-Agdeppa, Ph.D Josie Platon-Desnacido Ma. Lilibeth P. Dasco Apple Joy D. Ducay	December 15, 2022	DOST-FNRI
Scientific Technical Writer Award Nutrition Care Processes Can Improve the Nutritional Status and Quality of Life of Persons Who Use Drugs	Imelda Angeles-Agdeppa, Ph.D Frances Pola S. Arias	December 15, 2022	DOST-FNRI

<p>Scientific Book Writer Award</p> <p>Philippine Nutrition Facts and Figures: 2018–2019 Expanded National Nutrition Survey (ENNS)</p>	<p>Imelda Angeles-Agdeppa, Ph.D</p> <p>Charmaine A. Duante</p> <p>Chona F. Patalen</p> <p>Eva A. Goyena, Ph.D</p> <p>Cristina G. Malabad</p> <p>Charina A. Javier</p> <p>Glenda P. Azaña</p> <p>Glen Melvin P. Gironella</p> <p>Eldridge B. Ferrer</p> <p>Ma. Lynell V. Maniego</p> <p>Ma. Lilibeth P. Dasco</p> <p>Mario V. Capanzana, Ph.D</p>	<p>December 15, 2022</p>	<p>DOST-FNRI</p>
<p>Scientific Book Writer Award</p> <p>Philippine Nutrition Facts and Figures: 2018–2019 Expanded National Nutrition Survey (ENNS): Food Consumption Survey</p>	<p>Imelda Angeles-Agdeppa, Ph.D</p> <p>Charmaine A. Duante</p> <p>Chona F. Patalen</p> <p>Eva A. Goyena, Ph.D</p> <p>Cristina G. Malabad</p> <p>Charina A. Javier</p> <p>Glenda P. Azaña</p> <p>Glen Melvin P. Gironella</p> <p>Eldridge B. Ferrer</p> <p>Ma. Lynell V. Maniego</p> <p>Ma. Lilibeth P. Dasco</p> <p>Mario V. Capanzana, Ph.D</p>	<p>December 15, 2022</p>	<p>DOST-FNRI</p>
<p>Copyright</p> <p>Manual of Procedure: The Effects of Virgin Coconut Oil Among Suspect and Probable Cases of COVID-19</p>	<p>Imelda Angeles-Agdeppa, Ph.D</p> <p>Mario V. Capanzana, Ph.D</p> <p>Jacus S. Nacis, MBA-H</p> <p>Fabian M. Dayrit, Ph.D</p> <p>Carl Vincent D. Cabanilla</p>	<p>December 15, 2022</p>	<p>DOST-FNRI</p>
<p>Copyright</p> <p>Eat to Beat COVID-19: A Recipe Book for Suspect and Probable Cases</p>	<p>Imelda Angeles-Agdeppa, Ph.D</p> <p>Edelyn F. Calapano, RND</p> <p>Nicole Marie A. Lota, RND</p> <p>Gracielli Anne L. Paunlagui, RND</p> <p>Johnalen Aira S. Soberano, RND</p> <p>Mark Lester M. Cadayong</p>	<p>December 15, 2022</p>	<p>DOST-FNRI</p>
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FNRI Recognition, Model Employee, permanent, supervisory SLG	Marites V. Alibayan	December 15, 2022	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, supervisory SLG	Dan Emil G. Florendo	December 15, 2022	DOST-FNRI

FNRI Recognition, Model Employee, permanent, supervisory Agency Level	Rose Elaine P. Guilaran	December 15, 2022	DOST-FNRI
FNRI Recognition, Model Employee, non-permanent, supervisory Agency Level	Alvin O. Quetua	December 15, 2022	DOST-FNRI
FNRI Recognition, Exemplary Attendance and Punctuality Award	Eva L. Rebato	December 15, 2022	DOST-FNRI
FNRI Recognition, Exemplary Attendance and Punctuality Award	Charlie E. Adona	December 15, 2022	DOST-FNRI

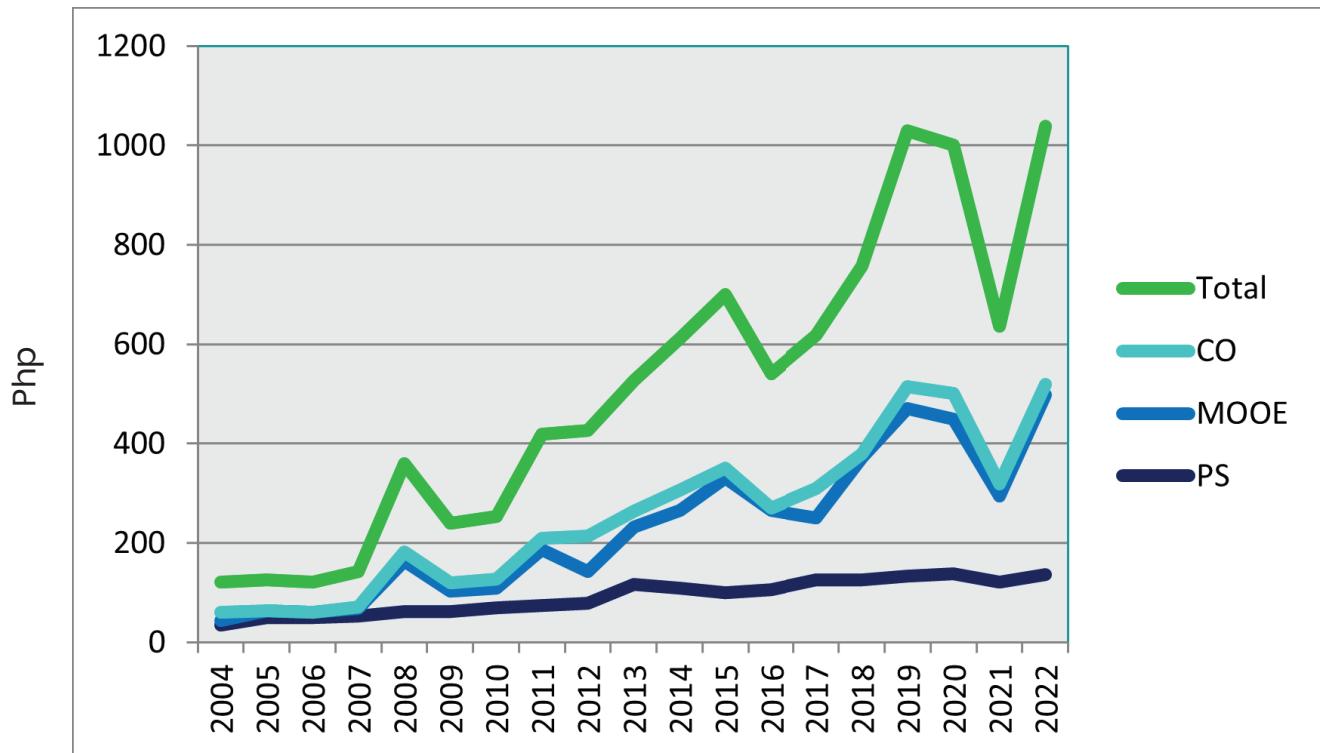




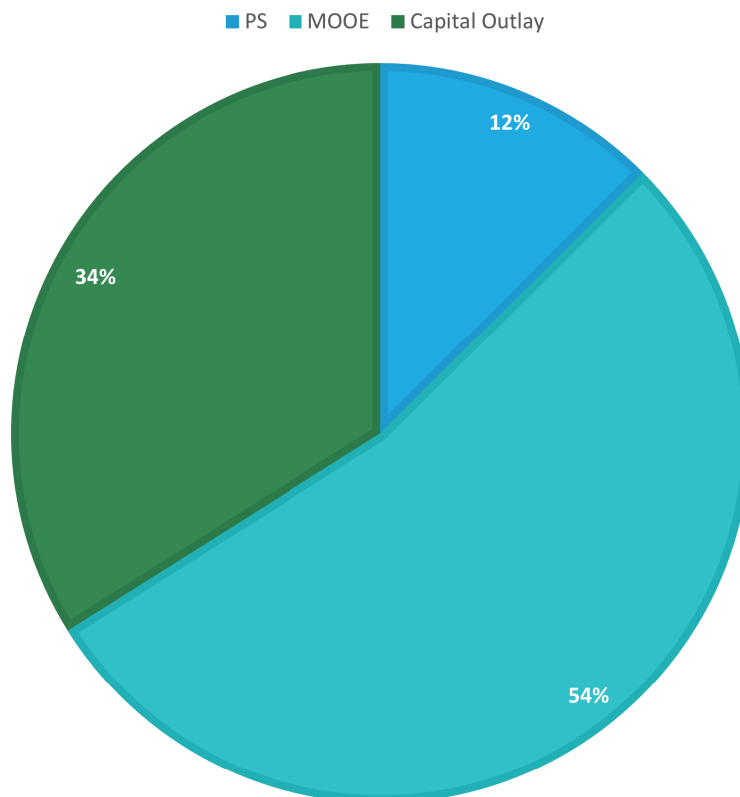
# FINANCIAL AND HUMAN RESOURCE MANAGEMENT



## BUDGET TRENDS BY EXPENSE CLASS, 2004- 2022



## EXPENDITURE BY PROGRAM EXPENDITURE CLASSIFICATION (PREXC) 2022



## RESOURCE GENERATION

### Breakdown of Cash Resources Generated

Release for current operating requirements from DBM on GAA CY 2022 (includes revalidation of reverted NCAs during the year)	525,838,000.00
Release for payment of terminal leave and other payables from DBM	2,848,903.90
DOST Sub Allotment for current year DOST-GIA Projects	40,305,268.11
Release for project implementation from government agencies	16,024,823.71
Release for project implementation from NGOs and local private companies	3,057,243.88
Release for project implementation from international organization and companies	2,113,452.00
Proceeds from sale of bid documents, trainings and seminars	675,000.00
<b>Total:</b>	<b>590,862,691.60</b>

### Non-Cash

Public Private Partnerships (PPP)	
- Printing of Nutrition Planner	906,000.00
- Mercury Drug - Promoting Good Nutrition and Wellness through MTVs	
Media Mileage Generated	519,515,498.82
<b>Total:</b>	<b>520,421,498.82</b>



# NON-FORMAL TRAINING PROGRAMS AND CONFERENCES ATTENDED BY FNRI STAFF



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**Non-Formal Training Programs and Conferences  
Attended by FNRI Staff**

## LOCAL

Title	Participants	Date	Organizer
Chemical Management by GHS and Risk Assessment in the Philippines	Johanne B. Guilaran	January 19–21, 2022	Samahan sa Pilipinas ng mga Industriyang kimika (SPIK)
Overview of ISO/IEC 17025	Johanne B. Guilaran	January 26, 2022	Glenwood Technologies International, Inc.
The Future of Workplace: Managing the Young Members of the Organization	Jacus S. Nacis	January 28, 2022	First Pacific Leadership Academy, Inc.
DOST Celebration of the International Day of Women and Girls in Science virtual forum on “Promoting Gender Equality in STEM for Sustainable Development” sponsored by PCHRD (9:00AM to 12:00 NN)	Marietta P. Rodriguez	February 11, 2022	PCHRD Via Zoom
Attended the ASEAN Dx Preparedness webinar series on “Vaccines and Immunity: Is Omicron the last threat?” (2:00 PM to 3:30 PM)	Marietta P. Rodriguez	February 11, 2022	Via Zoom
Crafting Rubrics for Students’ Creative Outputs in Chemistry	Michael E. Serafico	February 19, 2022	Philippine Association of Chemistry Teachers
Aligning your research on SGDs using SETI	Amster Fei P. Baquiran	February 21, 2022	DOST-NRCP





Science Policy and Information Forum on Program Development for Hearing Health	Michael E. Serafico	March 1, 2022	National Academy of Science and Technology
DepEd-BLSS Supply Mapping Workshop	DOST-FNRI Regional SBFP-Focal Persons	March 2-31, 2022	Department of Education Bureau of Learners Support Services – School Health Division (BLSS-SHD)
Batch 1 – Region 1, 2 & CAR, March 2, 2022	PCC		
Batch 2 – Region 3 – March 4, 2022	NDA		
Batch 3 – Region IV-A, March 8, 2022			
Batch 4 – Regions IVB & NCR, March 10, 2022			
Batch 5 – Region V, March 15, 2022			
Batch 6 – Region VI, March 22, 2022			
Batch 7 – Region VII, March 24, 2022			
Batch 8 – Regions VIII & IX, March 29, 2022			
Batch 9 – Regions X & Caraga, March 30, 2022			
Batch 10 – Regions XI & XII, March 31, 2022			
World Obesity Day Webinar	ME Serafico MP Rodriguez	March 4, 2022	National Nutrition Council
USJCMSP Virtual Workshop on “Interdisciplinary Research Approaches to Emerging Pathogens and Diseases of Global Health Concern”	Marietta P. Rodriguez	March 9-10, 2022	

Orientation of New Technical Assessors and Experts 2022	Johanne B. Guilaran	March 11, 2022	DTI-Philippine Accreditation Bureau
Session 1 of the Webinar Series on Sustainable Agriculture and Food System for Better Food and Nutrition	Carl Vincent D. Cabanilla	March 15, 2022	ILSI Philippines
2022 Annual Scientific Conference and 89th General Membership Assembly	ME Serafico MP Rodriguez	March 15, 2022	DOST-NRCP
DOST-PCHRD 40th Anniversary Session I: Introduction of New R&D Programs and PCHRD S&T Fellows	Carl Vincent D. Cabanilla	March 18, 2022	DOST-PCHRD
PAN Webinar: "Building Nutrition Resilience: Closely watching genes at work"	Carl Vincent D. Cabanilla	March 18, 2022	Philippine Association of Nutrition
Basic Health Research Ethics and Good Clinical Practice (Basic)	Johanne B. Guilaran	March 21-24, 2022	National Institutes of Health, University of the Philippines Manila
Good Laboratory Practices on Analytical Instrumentation	Michael E. Serafico	March 29, 2022	Shimadzu Philippines Corporation
Attended the webinar on "Agenda ng Kababaihan Tungo sa Kalusugan at Kaunlaran"	Marietta P. Rodriguez	March 29, 2022	DOST
Laboratory Accreditation Division (LAD) Assessors and Experts Forum 2022	Johanne B. Guilaran	April 4, 2022	Philippine Accreditation Bureau



DepEd School-Based Feeding Program National Work-Conference for FY 2022	DOST-FNRI Regional SBFP-Focal Persons PCC NDA	April 18-May 27, 2022	Department of Education Bureau of Learners Support Services – School Health Division (BLSS-SHD)
Batch 3 – Region 6, 7, & 8, April 18-20, 2022 Batch 4 – Region 9, 10, & 13, Apr 20-22, 2022 Batch 1 – Region 1, 2, 3 & CAR Apr 25-26, 2022 Batch 2 – NCR, CALABARZON, MIMAROPA & Region 5, May 2-4, 2022 Batch 5 – Region 11 & 12, May 25-26, 2022			
Quality, Costs, and Compliance under Control	Johanne B. Guilaran	April 25, 2022	Mettler Toledo
Looking Back: Chemistry and KKP in the Philippines	Michael E. Serafico	May 4, 2022	Kapisanang Kimika ng Pilipinas
ISO/IEC 17025:2017 Laboratory Management System Documentation	Johanne B. Guilaran	May 11-12, 2022	DTI-PTTC
Online Training: Root Cause Analysis Aligned With Iso 9001:2015 Corrective Action	Alexis M. Ortiz	May 18, 2022	PRIMA PRIME MANAGEMENT SYSTEMS CONSULTANCY
Course on Radioisotope Technology	Johanne B. Guilaran	May 6 – June 30, 2022	DOST-PNRI Nuclear Training Center
Introduction to Evidence-Informed Policymaking for Health	Jacus S. Nacis	May 26, 2022	Philippine Council for Health Research and Development (DOST-PCHRD)
DOST-FNRI Impact project capacity-building webinar titled: Development of Technology Transfer Plan”	DOST-FNRI SUCs	May 30, 2022	DOST-FNRI IMPACT Project Team



Forum on Nuclear Energy: Competitiveness and Sustainability in the Philippines	Michael E. Serafico	June 2, 2022	National Academy of Science and Technology
School-Based Feeding Program (SBFP) Implementation Review and Planning Workshop	DOST-FNRI Regional SBFP-Focal Persons PCC NDA	July 4-21, 2022	Department of Education Bureau of Learners Support Services – School Health Division (BLSS-SHD)
Batch 1 – Region 1, 2, 3 & CAR, July 4-7, 2022			
Batch 2 – Region 4A, 4B, 5 & NCR, July 11-14, 2022			
Batch 3 – Region 6,7,8 & 9, July 18-21, 2022			
Project Management Training-Workshop	Johanne B. Guilaran	July 6-7, 2022	DOST-CO
44th Annual Scientific Meeting	Carl Vincent D. Cabanilla	July 13-14, 2022	NAST
Enhanced Partnership Against Hunger and Poverty “EPAHP” Planning and Synergy Workshop	Alexis M. Ortiz	July 13 – 15, 2022	DSWD CALABARZON
Fundamentals of Gas Chromatography	JBGuilaran, DMSLeonardo, AFPBaquiran	July 22, 2022	Shimadzu Philippines Corp
DOST-FNRI Impact project capacity-building webinar titled “Art of Pitching + Business Development”	DOST-FNRI SUCs	July 29, 2022	DOST-FNRI IMPACT Project Team
Training-workshop on Quality Assurance/ Quality Control (QA/QC) and Method Verification/ Validation	JBGuilaran, AFPBaquiran	August 3-4, 2022	DA-Bureau of Soils and Water Management
Understanding the impact of bead beating in sample preparation of food for microbial analysis	Amster Fei P. Baquiran	August 25, 2022	DOST-ITDI



DOST-FNRI After Tech-Transfer Support Webinar on “Bureau of Internal Revenue Business Registration and Tax Clearance Issuance”	DOST-FNRI SUCs MSMEs	September 9, 2022	DOST-FNRI IMPACT Project Team
Accelerating Transformation for Sustainable Development through Science, Technology and Innovation	Michael E. Serafico	September 9, 2022	Philippine Association for the Advancement of Science and Technology
36th Philippine Chemistry Congress	Michael E. Serafico	Sept 29 – Oct 1, 2022	Philippine Federation of Chemical Societies
Python for Data Engineering	Amster Fei P. Baquiran	September 29 & 30, 2022	DAP
The 20th Newborn Screening Convention: “Milestones and Advances in Newborn Screening of the Newborn Screening”	Ruby D. Frane Jason Paolo H. Labrador	October 3, 2022 (Pre-Convention) 8 AM – 12 noon (4 hrs)  October 4-5, 2022 (Main Convention) 8 AM to 12 noon (8 hrs)	Newborn Screening Society of the Phil., Inc.
Statistical analysis and modeling using SQL and Python	Amster Fei P. Baquiran	October 6 & 7, 2022	DAP
Data Dissemination of the NCR’s 2021 Full Year Poverty Statistics	Noelle Lyn C. Santos Jason Paolo H. Labrador	October 10, 2022	Philippine Statistics Authority (PSA)
Overview of ISO/IEC 17020	Johanne B. Guilaran	October 17, 2022	DTI-PAB
Data science and machine learning using Python	Amster Fei P. Baquiran	October 19, 2022	DAP

2022 DOST GAD Focal Point Assembly Theme: Functional GFPS: Leading Towards a Gender-Responsive DOST	Marilou L. Madrid	October 26-28, 2022	DOST-GFPS
Assessing the State of Food Security in the Philippines	Jason Paolo H. Labrador (as panel discussant) Merlyn G. Tajan	October 27, 2022 2-4 PM (2 hrs)	Philippine Institute for Development Studies (PIDS)
Global Conference on Sustainable Plant Production	Imelda Angeles-Agdeppa, Ph.D Eva A. Goyena, Ph.D. Charina A. Javier	Nov. 2-4, 2022	UN-FAO, Rome, Italy
Update Training in Good Clinical Practice	Carl Vincet D. Cabanilla	November 2-4, 2022	UP-NIH
Public Workforce Future proofing: Elevating Productivity in the New Normal 1. The Current Landscape of Work and Demand for New Competencies in the Public Sector 2. Wellness and Resiliency in the New Normal	Ma. Anna Rita M. Ramirez Merlyn G. Tajan	November 3-4, 2022 2-3 PM (2 hrs)	APO Center of Excellence on Public Sector Productivity, DAP
DOST-FNRI's Project IMPACT – Teamed-Up! “Enhancement of Technology Transfer Office Operation Towards a Mutual Mission of Bringing Technologies from Lab to Market”	Central Bicol State University of Agriculture (CBSUA) -Faculty from main campus and other campuses -Non-teaching personnel	November 7-10, 2022	DOST-FNRI IMPACT Project Team
Training on the ISO 29993:2017 Documentation and Implementation	Amster Fei P. Baquiran	November 8 & 9, 2022	TUV Rheinland Philippines Inc.
Training Course on Digitalization of MSMEs In the Manufacturing Sector (Virtual Session)	Alexis M. Ortiz	November 8 – 11, 2022	ASIAN PRODUCTIVITY ORGANIZATION
Diabetes Philippines Online Convention (Day 1)	Hazel T. Lat	November 9, 2022	Diabetes Philippines





DOST-FNRI's Project IMPACT – Teamed-Up! “Enhancement of Technology Transfer Office Operation Towards a Mutual Mission of Bringing Technologies from Lab to Market”	Davao del Norte State College (DNSC) -Faculty -Non-teaching personnel	November 14-17, 2022	DOST-FNRI IMPACT Project Team
Public Service Values Orientation	Ma. Anna Rita M. Ramirez	November 24, 2022 9 AM to 12 noon (3 hrs)	Civil Service Commission (CSC)
National Kidney and Transplant Institute, Nutrition and Dietetics Division (NKTi-NDD) Webinar	Marilou L. Madrid	November 24, 2022 9 AM to 4 PM (6 hrs)	National Kidney and Transplant Institute (NKTi)
4th National Research Council of the Philippines (NRCP) Membership Application Procedures (MAP) Orientation	Marilou L. Madrid	November 25, 2022 9 to 11 AM (2 hrs)	National Research Council of the Philippines (NRCP)
DOST-FNRI After Technology-Transfer Support Activity : “Marketing your Brand”	DOST-FNRI SUCs	December 6, 2022	DOST-FNRI IMPACT Project Team
Technical R Training for LNOB Analysis in the Philippines	Eldridge Ferrer Marvin Delos Santos Cheder D. Sumangue	December 13-14, 2022	United Nations Economic and Social Commission for Asia and the Pacific

## INTERNATIONAL

Title	Participants	Date	Organizer
Assessing Calcium Status and Effects of Prenatal Supplementation	Amster Fei P. Baquiran	January 18, 2022	New York Academy of Sciences
Food-based solutions to improve calcium intake	Amster Fei P. Baquiran	January 25, 2022	New York Academy of Sciences
Fundamentals of Working Safely in a Biological Safety Cabinet	Johanne B. Guilaran	January 26, 2022	Centers for Disease Control and Prevention
Thermo Fisher Scientific LC-MS/MS Virtual and Hands-on Training for FNRI	Carl Vincent D. Cabanilla	Feb. 15-16, Mar. 1, 3, 8, 28-29, 2022	Thermo Fisher Scientific Singapore and Electrobyte Environmental Concerns Corp.
Glycemic Index and Diabetes Management	Johanne B. Guilaran	March 8, 2022	Diabetes Qualified
Is there “gold” in golden rice?: Addressing vitamin A deficiency through biofortification	Carl Vincent D. Cabanilla	March 23, 2022	UPLB-IHNF, HKI and John Hopkins University
Second Coordination Meeting for CRP E43033	Michael E. Serafico	June 20-23, 2022	IAEA
COSHH Awareness	DMSLeonardo	June 24, 2022	The Knights of Safety™ Academy
COSHH Hazard Communication Awareness	DMSLeonardo	June 24, 2022	The Knights of Safety™ Academy
COSHH and Respiratory Sensitisers Awareness Course	DMSLeonardo	June 24, 2022	The Knights of Safety™ Academy
Hazardous Substances Routes-to-Entry	DMSLeonardo	June 27, 2022	The Knights of Safety™ Academy
The COSHH Risk Assessor Certification™	DMSLeonardo	June 27, 2022	The Knights of Safety™ Academy



Product Presentation on Delta-Q IRMS	JBGuilaran, AFPBaquiran, CVDCabanilla	July 22, 2022	Thermo Fisher Scientific Singapore
Training on Efficacy of Amino Acid Supplementation in Treating Environmental Enteric Dysfunction Among Children at Risk of Malnutrition	ME Serafico, CVDCabanilla, AFPBaquiran	September 12-16, 2022	IAEA and SJRI
FAO in Geneva Nutrition Dialogue Series	CVDCabanilla	September 28, 2022	FAO Geneva Liaison Office
10th Seoul International Congress of Endocrinology and Metabolism	ME Serafico	October 27-29, 2022	Korean Endocrine Society
A novel <sup>13</sup> C-Sucrose Breath Test to assess gut health and sugar intake in the context of the double burden of malnutrition	CVDCabanilla, AFPBaquiran	November 17, 2022	European Association for Gastroenterology, Endoscopy and Nutrition (EAGEN) and International Atomic Energy Agency (IAEA)
SEA-PHN Network Webinar Series 2/2022: Promotion and Consumers' Use of Food-Based Dietary Guidelines (FBDGs) in SEA Countries	CVDCabanilla	November 25, 2022	Nutrition Society of Malaysia
Mass Spectrometry for Organic Chemistry – from Basics to Implementation	JSNacis	November 28, 2022	Wageningen University and Research
Global Conference on Sustainable Plant Production	Imelda Angeles-Agdeppa, Ph.D Eva A. Goyena, Ph.D. Charina A. Javier	Nov. 2-4, 2022	UN-FAO, Rome, Italy
Scientific Visit in the Netherlands	David Kenneth C. Mendoza	December 12-17, 2022	DOST-FNRI





# FORMAL TRAINING ATTENDED BY DOST-FNRI STAFF



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Formal Training Attended by FNRI Staff

## COMPLETED

Scholars	Division	M/MS/MA/PhD or Graduate Diploma Course	School/University	Date of Completion
Mildred O. Guirindola	NAMD	PhD Environmental Science	UPLB	Completed 2022
Frances Isabelle B Jacalan	NFRDD	MS Genetic Counseling	UP Manila	Graduated 2022

## ON-GOING (INTERNATIONAL)

Scholars	Division	M/MS/MA/PhD or Graduate Diploma Course	School/University
Mark Pretzel P. Zumaraga	NFRDD	PhD in Life and Health Sciences (Nutrition)	Aix-Marseille University, France

## ON-GOING SANDWICH PROGRAMMES (INTERNATIONAL)

Scholars	Division	M/MS/MA/PhD or Graduate Diploma Course	School/University
Robby Carlo A. Tan	NFRDD	PhD Sandwich Programme (Nutrition and Health)	Wageningen University
Jacus S. Nacis	NFRDD	PhD Human Nutrition	Wageningen University



## ON-GOING (LOCAL)

Scholars	Division	M/MS/MA/PhD or Graduate Diploma Course	School/University
Ma Julia G Gubat	NFRDD	PhD Nutrition	UPLB
Alex M Palomo	NFRDD	PhD Food Science	UPLB
Divorah V. Aguila	PEU	PhD Developmental Studies	UPLB
Maylene P Cajucom	NAMD	MS Public Health (Nutrition)	UP Manila
Leah C Dajay	NFRDD	Public Management Development Program	Development Academy of the Philippines
Claire S Malibiran	NFRDD	Master in Food Safety Management	Philippine Women's University
Deniese Abbie Caballes	NFRDD	MS Microbiology	UST





# FUTURE DIRECTIONS



# FUTURE DIRECTIONS - DOST-FNRI SHINES

## “SHIFTING AND HARNESSING INNOVATIONS TOWARDS NEW SOLUTIONS TO END MALNUTRITION”



Anchored on the theme of the 2023 DOST-FNRI Corporate Planning Workshop held in September 2022 in Clark Pampanga, the Institute aims to shine brighter in the next ten years, 2023-2032, as it shifts and harness innovations towards finding new solutions to end malnutrition.

With the Institutional Roadmap as its guide, the DOST-FNRI will continue to pursue four (4) major strategies as identified in the Food and Nutrition Research and Development (F&N R&D) Agenda 2023-2032 namely: Knowledge generation, Malnutrition reduction initiatives, Knowledge diffusion and technology transfer, and Efficient governance. Under

each strategy, budget estimates for major programs by decade were identified as well as the corresponding 6Ps outputs, that is Publication, Product, Patent, People Services, Policy, and Partnerships.

### Knowledge Generation

Knowledge generation formally occurs through directed research and experimental development in academic and public institutions. Whether as individual researchers; in research teams; or even in collectives such as organizational sub-units, entire organizations, or nation-states, the people are the critical input for knowledge generation. Likewise, Knowledge is created through practice, collaboration,

interaction, and education. Thus, it focuses on attributes of human capital inputs and related outputs.

- R&D Program on Addressing Inborn Error of Metabolism (IEM): Promoting Quality Life among Filipino Children with IEM through Food and Nutrition Solutions
- R&D Program on Functional Foods: Functional Food R&D Agenda on Philippine Seaweeds
- Food and Nutrition 4.0
- R&D Program on Development of Tools and Standards
- R&D Program on Nutrigenomics
- Eastern Visayas Birth Cohort (EVBC) Program
- Program Addressing NCDs and Nutrition-related diseases in the different life stages
- R&D Program on Food Quality and Safety
- Nutritional Assessment and Monitoring Program
- In-depth and Correlation Studies

### Malnutrition Reduction Initiative

Malnutrition reduction initiatives focuses on ways to diminish malnutrition through reassuring and health care interventions. Issues of targeted subsidies, helping poor people, job creation, and production are also significant and need to be considered. Numerous current nutritional problems are due to the wrong consumption culture in the family that transfers to children, low nutritional literacy will result in inadequate nutrition, malnutrition, and other obstacles.

- R&D Program on Innovative Food Products
- R&D Program Addressing Macronutrient Deficiency
- R&D Program Addressing Micronutrient Deficiencies
- R&D Program on Intervention and Policy Studies

### Knowledge Diffusion and Technology Transfer

Technological advancement includes the generation of new understanding that can be functional to dynamic activity, to some extent technical advancement is strongly subjective by the capacity to access, adapt and diffuse technological knowledge that has been generated. Also, technological learning and innovation are essential for economic growth and development and are major determinants of long-term improvements in income and living standards. To improve the speed and widespread of new technology adaption, the casual link between knowledge is needed to design and execute optimized and efficient technology adaption policy.

- Development, Updating, Pre-Testing, Production and Evaluation of Food and Nutrition (F&N) Information Packages
- Oh My Gulay (OMG)! Sa FNRI: A Step Towards Biodiversity
- F & N TRAINS: Food and Nutrition TRAINing for Stakeholders
- Technology Transfer and Commercialization of FNRI Technologies and Products
- Marketing of DOST-FNRI Products and Services (MAPS)
- Food and Nutrition Information Resource Station (FIRSt)

### Efficient Governance

Efficient Governance is represented in organizations that function in an effective and efficient, transparent, and responsible manner for attaining sustainable development. Lack of public participation, transparency and accountability represent some of the main constraints for the development and implementation of strategies, policies, and action plans. Thus, counteractive movements and reforms in the existing institutional set-ups/standards





of governments are required to improve quality of service. Transparency and accountability should be established to earn public trust.

- Implementation and Continuous Improvement of ISO 17043:2010 Quality Management System of FNRI-PTL
- Accreditation of FNRI-RMP to ISO 17034:2017
- Positioning of the Glycemic Index Laboratory in Accordance with ISO 17025:2017
- Upgrading of the Nutrition, Physiology and Aging Laboratory
- Strengthening the FNRI-SEL towards a Successful Food R&D and S&T Services (ISO/IEC 17025:2017 compliant)
- Building Science Capacity through Computerized Sensory Evaluation for DOST-FNRI, DOST-RSTLs, FICs and U/SUCs
- Capability for Shelf life Testing for Nutritious Food Products
- Making busiSENCE out of FNRI Data (SENSory evaluation, Consumer and foods that we Eat)
- Laboratory Technical Services
- Sustainability and expansion of scope for ISO 17025 accreditation
- Upgrading of FNRI-SL Equipment and Facilities
- Sustainability of FIERC Accreditation
- Human Resource Development Program
- Financial Management Program
- Supply Delivery Mechanism Program
- Efficient Customer Services Program
- Digitized Governance Program

The DOST-FNRI Management will continue to drive its employees towards scientific productivity by encouraging them to publish scientific reports in local and international journals. Products of research such as nutritional food products, tools and

guidelines addressing various food and nutrition concerns will still be developed/standardized and scaled-up converting research findings to something tangible and utilizable. As researchers transfer these products and knowledge, the need to have it patented will also be ensured to protect the intellectual property rights inputted into these products.

People services is yet another Ps that DOST-FNRI needs to fulfill. Getting the knowledge and technologies across through trainings, seminars and technical assistance are just some of the modes to actualize DOST's mantra of making science for the people.

Efforts to bridge the link between research and policy using evidence-based data in policy formulation, translation of the Institute's project results into policy recommendations will be continued. These policies will be disseminated to local and national legislators to open opportunities for researches to cross towards the policy development path. Efficacy and effectiveness of nutrition intervention programs, models and strategies are still in the forefront of researches to be undertaken under malnutrition reduction initiatives.

Recognizing that government funds alone cannot entirely support R&D and S&T programs and projects, the Institute will maintain and/or renew partnerships with local and international stakeholders in pursuit of additional support for man, money and machine.

2023 is another challenging year that DOST-FNRI will have to face head-on. Equip with a strong-willed Management and staff, new and improved facilities and support from stakeholders who believes in the vision and mission of the Institute, DOST-FNRI will eventually win the war against malnutrition.





# LIST OF R&D AND S&T PROJECTS FOR 2022

## OUTCOME 1

### R&D Program Addressing Micronutrient Deficiency

- Beta-carotene rich red palm oil
- Revisiting RA 8976: Integrating folic acid in flour fortification

### R&D Program Addressing Macronutrient Deficiency

- Boost your Child's Nutrition with Coconut-based Complementary Foods

### R&D Program Addressing Normal Nutrition and Nutrition-related Diseases: Nutrition in the Life cycle Program

- Why Filipino adolescents are physically inactive today?

### R&D Program on Food Quality and Safety

- Development of Food Reference Materials for Nutrition Labeling for Use of Local Testing Laboratories
- Amino Acid Content in Selected Commonly Consumed Foods in the Philippines
- Proficiency Testing Provision and Development of Quality Control Material for Testing of Food Quality and Safety
- Development of Food Safety Guidelines for the Food Service Sectors
- Development of Low Heat and Low Humidity (LH)<sup>2</sup> Drying System for DOST Malnutrition Reduction Program (DOST-MRP) Facilities

### R&D Program on Development of Tools and Guidelines

- The Philippine Nutrient Profile Model
- Updating of the Philippine Food Composition Tables (PHILFCT<sup>®</sup>) Online Database and Mobile Application Data
- What do older Filipinos eat? – Understanding the dietary patterns of older Filipinos from National Nutrition Surveys
- OPTIDIETS: Optimization of Low-Cost, Nutritionally Adequate Diets for Filipinos Using a Software Analysis Tool
- Make Filipino Meriendas Healthier with DOST-FNRI's Snacks and Beverage Recipes
- In Vitro Mineral Availability from Meals based on *Pinggang Pinoy*<sup>®</sup> Recommendations



## **R&D Program on Food Product Innovation**

- Pilot Scale Production and Shelf-Life Study of Ready-to-Eat Instant Meal (Instant Pork Picadillo with RTE Dried Fruit Mix)
- Pilot Scale Production and Shelf-Life Study of FNRI Developed Prebiotic Rich Granola
- Pilot Scale Production and Shelf-Life Study of FNRI-Developed Iron Fortified Rice (IFR) Using Fabricated Blending Machine
- Pilot Scale Production and Shelf-Life Study of FNRI-Developed Protein Cracker Using Fabricated Blending Machine
- Utilization of Coconut-based Products for the Development of a Prototype Viable Functional Foods

## **R&D Program on Emerging Diseases**

- Virgin Coconut Oil (VCO) Supplementation Relieves Symptoms and Inflammation among COVID-19 Positive Adults: A Single-Blind Randomized Trial

## **R&D Program on Nutrigenomics**

- Digital Polymerase Chain Reaction for Targeted Analysis of Copy Number Variations

## **R&D Program on Efficient Governance: Services to Internal and External Clients**

- Maintaining and Sustaining the Operations of the Nutritional Food R&D Section's Physico-chemical Laboratory Towards PRC Accreditation for an Efficient Food R&D and S&T Services

## **Nutritional Assessment and Monitoring Program**

### **R&D Program on Intervention and Policy Studies**

- Project ANAK (Accelerated Nutrition Advocacy for Kids): A Model Delivery System for Complementary Feeding and Nutrition Education in the Countryside
- MADERS' (Mothers and Adolescent Girls') Monitoring: Kick-off to the First 1000 Days
- Translating Research Results to Policy Statements: An Easy Access to Nutrition Information

### **In-depth and Correlation Studies**

- Effects of local nutrition program implementation on food security and nutritional status: Case study of Batanes and Aurora Province
- Analysis of the Cost of One-day Food Consumption of Households Meeting Requirements for Energy and Nutrients



- Validation of Physical Activity, Sedentary Behavior, and Sleep (PASS) Questionnaire for Philippine National Nutrition Survey (NNS)
- Evaluation of the 2021 Infant and Young Child Feeding Indicators for Appropriate Complementary Feeding in relation to Dietary Adequacy and Anthropometric Growth
- Drivers in Anemia Reduction among Women of Reproductive Age: The Philippines Case Study
- Drivers of Food Insecurity in Rural and Urban Households in the Philippines: 2018 Expanded National Nutrition Survey
- Factors Associated with Consumption of Fruits and Vegetables among Filipino Adults: Based on 2018–2019 Expanded National Nutrition Survey (ENNS)
- Predictors of Physical Inactivity among Filipino Adolescents: 2018–2019 ENNS
- Establishing Blood Pressure Norms for Filipino Children
- Factors Associated with High Fasting Blood Glucose among Filipino Adults Not Diagnosed with Diabetes
- The Association of Micronutrient Supplementation on Health and Nutrition Status of Under fives
- Protecting health and nutrition of vulnerable groups in emergencies
- Evaluation of macro- and micronutrient intake of stunted Filipino school-age children, 5 to 10 years old

## Nutrition Survey and Related Studies

- The 2021 Expanded National Nutrition Survey (ENNS) The third and last year of implementation
- Vitamin a Status of Filipino Preschool Children and Pregnant Women
- Iodine Status in Filipino Women: Pregnant, Lactating and at Reproductive Age
- Iodized Salt Testing for the Expanded National Nutrition Survey
- ENNS Regional Level Estimation Procedure
- Predicting malnutrition among children under five years old with the use of classification techniques in Data Mining
- Development of Nutrition Survey Data Warehouse System
- AR Dietary Assessment Tool: Development and implementation of deep Learning-based food image recognition and Augmented Reality dietary assessment tool for the ENNS Dietary Data Collection
- eDCS Innovations: Streamlining the ENNS data collection process
- Development and Validation of Adult-Male Equivalent (AME) Distribution for Filipino Households and its Application to the Household Food Consumption Survey
- Municipal level estimation of stunting among under 5 years old children
- Evaluation of Nutritional Adequacy and Biomarkers Associated with Stunting: Analysis of Data from the 2019 National Nutrition Survey





## Technology and Knowledge Diffusion Program

- Analysis of Trans-fat Content of Fats and Oils and Commonly Consumed Foods in the Philippines
- Malnutrition Reduction Program: Moving Forward Sustained Implementation Project I: Roll-Out of Complementary Food Processing Facility (Batch 3)
- MRP DOST PINOY Continues to Address the Undernutrition Problem among Infants and Young Children
- Behind Numbers: Engaging Media Partners in Communicating R&D Results and S&T Services
- FN TRAINS- Food and Nutrition Trainings for Stakeholders

## OUTCOME 2

### Technology Adoption Promoted and Accelerated

- Transferred technology and services to adoptors
  - Licensing Agreements
  - Site Visits/Monitoring and Evaluation/Technology Needs Assessments
  - Trademarks, Patents/Utility Models and Copyrights

### Develop STI Human Resource and Build Strong STI Culture

- Science Promotion Programs
  - Laboratory services
  - Library services
  - Food and Nutrition Information Resource Station (FIRSt) Services
  - Nutrition Research Information Network (NUTRINET)
- Science and Technology Promotion Services
  - Promotion and Services Rendered
  - Social Media Metrics
- Oh My Gulay! Sa FNRI
- New Information, Education, Communication (IEC Packages) and Other Innovative Strategies
- 2022 Fnri Seminar Series
- Multimedia nutrition promotion (media mileage)

### Strengthen Industry- Academe Government and International STI Collaborations

- 2022 Contract Researches and Other Collaborative Projects on Food and Nutrition



## **Upgrade STI facilities and capacities to improve S&T Services**

- Protecting human participants in research: A joint commitment by the FIERC and DOST-FNRI
- Quest for Philippine Quality Awards (PQA): DOST-FNRI Gearing Towards Performance Excellence through Total Quality Management and ISO 9001:2015 Sustainability
- DOST-FNRI Gender Focal Point System (GFPS): Agents in mainstreaming Gender and Development (GAD) concerns in the Institute
- On-the-job Training
- In-house training organized and attended by FNRI Staff
- 2022 Scientific Linkages and International Cooperation
- Scientific Papers Published
- Journal Citations
- Scientific Paper Presented
- Poster Presentation
- Technical Trainings
- Technical Trainings on DOST-PINOY
- 2022 AWARDS

## **Financial and Human Resource Management**

- Expenditure by Expense Class 2022
- Expenditure by Program Expenditure Classification (PREXC) 2022
- Resource Generation
- Non-Formal Training Programs and Conferences Attended by FNRI Staff
- Formal Training Attended by DOST-FNRI Staff



# DOST-FNRI MANAGEMENT COMMITTEE



**IMELDA ANGELES-AGDEPPA PH.D.**  
Director IV and Scientist IV

**MILFLOR S. GONZALES PH.D.**  
Chief Science Research  
Specialist, TDSTD  
and OIC, ODD



**CHARMAINE A. DUANTE**  
Chief Science Research  
Specialist, NAMD

**ROSEMARIE J. DUMAG**  
Supervising Science  
Research Specialist and  
OIC, NFRDD  
(January to March 2022)



**MICHAEL E. SERAFICO**  
Supervising Science  
Research Specialist and  
OIC, NFRDD  
(April to July 2022)





**KRISTINE B. NACIONALES**  
Supervising Science  
Research Specialist and  
OIC, NFRDD  
(August to December 2022)



**BUENALIVIA N. OLATAN PH.D., DBA**  
Chief Administrative Officer,  
FAD



**LEAH C. DAJAY**  
Senior Science Research  
Specialist and FNRI EA  
President



**DIVORAH V. AGUILA**  
Planning Officer IV &  
Secretariat, MANCOM



**MARILITA A. AGUILOS**  
Planning Officer III &  
Secretariat, MANCOM



# PRODUCTION STAFF

## Editor

Milflor S. Gonzales, Ph.D.  
Chief Science Research  
Specialist

## Production Coordinator

Idelia G. Glorioso  
Supervising Science Research  
Specialist

## Production Assistant Coordinators

Shannen Faye Q. Arevalo  
Science Research Specialist II

Christelle Lois T. Bayalas  
Science Research Specialist I

Eva L. Rebato  
Science Aide

Ma. Corazon E. Palompo  
Science Research Specialist I

Dexter Y. De Leon  
Senior Science Research  
Specialist

## Writers

Abbie L. Padrones  
Alex M. Palomo  
Marilou L. Madrid  
Merlyn G. Tajan  
Leah C. Dajay  
Kristine B. Nacionales  
Trinidad II T. Arcangel  
Engr. Charlie E. Adona  
Michael E. Serafico  
Robby Carlo Tan  
Carl Vincent D. Cabanilla  
May Ann D. Gironella  
Ma. Lourdes T. Cumagun  
Engr. Jayson G. Tagaroma  
Imelda Angeles-Agdeppa Ph.D.  
Mark Pretzel P. Zumaraga  
Julieta B. Dorado  
Marie T. Bugas, Ph.D.

## Writers (continuation)

Charina A. Javier  
Ma. Anna Rita M. Ramirez  
Chona F. Patalen, MPH  
Eva A. Goyena, Ph.D.  
Josie Platon-Desnacido  
Glenda P. Azaña  
Patricia Isabel Gayya-Amita  
Maylene P. Cajucum  
Ma. Lynell V. Maniego  
Mae Ann S.A. Javier  
Charmaine A. Duante, RMT, MSc  
Epid.(PH)  
Glen Melvin P. Gironella  
Cristina G. Malabad  
Rosemarie J. Dumag  
Alexis M. Ortiz  
Nichole M. Bristol  
Josefina T. Gonzales  
Dexter Y. De Leon  
Idelia G. Glorioso  
Shannen Faye Q. Arevalo  
Joan C. Duldulao  
Marilita A. Aguilos  
Jester C. Viriña

## Creative Artists

Erika Niña C. Bacolod  
Science Research Specialist I

John Mark M. Villanueva  
Science Research Analyst

Nichole M. Bristol  
Science Research Specialist II

## Composer

Erika Niña C. Bacolod  
Science Research Specialist I

## Proofreaders

Idelia G. Glorioso  
Supervising Science Research  
Specialist

Salvador R. Serrano  
Sr Science Research Specialist

## Proofreaders (continuation)

Dexter Y. De Leon  
Senior Science Research  
Specialist

## Circulation Team

Dexter Y. De Leon  
Senior Science Research  
Specialist

Ma. Corazon E. Palompo  
Science Research Specialist I

## Advisers

Imelda Angeles-Agdeppa, Ph.D.  
Director IV and Scientist IV

Milflor S. Gonzales, Ph.D.  
Officer-in-Charge, Office of  
the Deputy Director and Chief  
Science Research Specialist,  
TDSTSD

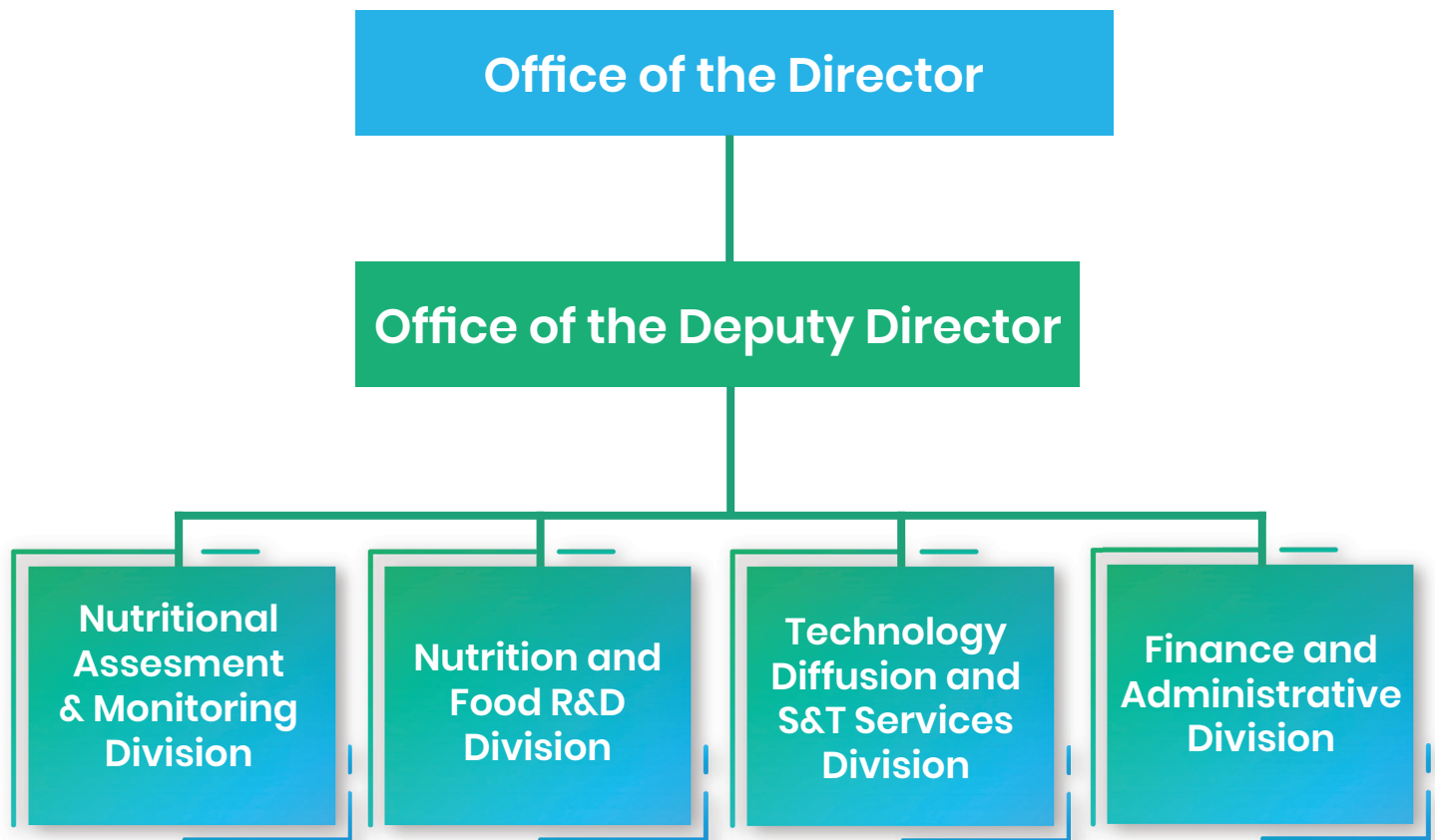
Charmaine A. Duante  
Chief Science Research  
Specialist, NAMD

Rosemarie J. Dumag  
Chief Science Research  
Specialist, NFRDD

Jester C. Viriña  
Supervising Administrative  
Officer and OIC, FAD

Leah C. Dajay  
Senior Science Research  
Specialist and FNRI EA President

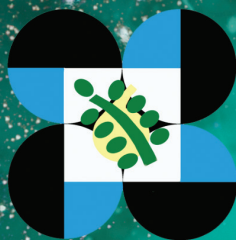
# ORGANIZATIONAL STRUCTURE



As per EO 366, approved implementation date, November 13, 2009







**DOST-FNRI**

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

DOST Compound, General Santos Avenue, Bicutan, Taguig City  
8-837-2071 local 2934 | 8-837-3164  
dostfnri47@gmail.com  
fnri.dost.gov.ph